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Pragmatic and Conversational Features of Arabic-Speaking Adolescents with Autism Spectrum Disorder (ASD): Examining performance and caregivers' perceptions

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Pragmatic and Conversational Features of Arabic-Speaking Adolescents with Autism Spectrum Disorder (ASD): Examining performance and caregivers' perceptions

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I dedicate this work

To my dear father and mother, for their prayers and unconditional love

To my beloved husband, Hisham, for his endless love, support and sacrifices,

To my sons, Asim and Yamin, for giving me strength and bringing joy to my life,

To my sisters and brothers for their confidence in me

To all people with autism for inspiring me.

Thank you… I love you all.

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Abstract

Background. This study investigates the features of pragmatic and conversational skills in the language of Arabic-speaking adolescents with Autism Spectrum Disorder (ASD) by comparing them with typically developing (TD) Arabic-speaking adolescents in Saudi Arabia. It aims to identify the differences in the pragmatic behaviours of the two groups (ASD and TD) with respect to four main pragmatic areas: discourse management, communicative functions, conversational repair and presupposition abilities. Impairments in these areas are the most commonly reported pragmatic deficits among people with ASD and impede their ability to conduct conversations successfully. This study addresses the gap in research on adolescents with ASD in Saudi Arabia and the lack of tools to evaluate pragmatic competence and impairment in the Arabic language. It further addresses methodological limitations of previous studies on pragmatic skills in ASD.

Methods. 15 Arabic-speaking Saudi adolescents with ASD and a control group of 15 Arabic-speaking Saudi TD adolescents participated in this study as well as their caregivers. The adolescents were matched for gender (10 male and 5 female in each group, TD and ASD); first language (Arabic); and verbal ability. All participants were in the normal IQ range. A comprehensive, mixed-methods approach was used to assess the pragmatic and conversational skills of the adolescents, including both direct and indirect measures from two sources of information, the adolescent participants and their caregivers, and both quantitative and qualitative methods. Data were collected on the adolescents' performances using semi-structured conversations with the Yale *in vivo* Pragmatic Protocol (YiPP; Simmons et al., 2014), and natural language samples. In addition, a caregiver questionnaire, the Pragmatics Profile of Everyday Communication Skills (PPECS; Dewart and Summers, 1996) was used to collect data on the caregivers' perceptions of the adolescents' abilities. Result of the YiPP and the PPECS were statistically analysed and language samples were analysed using discourse analysis methods.

Results. Findings based on both the adolescents' performances and the caregivers' perceptions show an overall deficit in the pragmatic and conversational skills of adolescents with ASD compared to their TD peers. However, variations were found in the pragmatic performances of participants with ASD, especially in their caregivers' ratings, and pragmatic

strengths were reported in some areas. Both the adolescents' performances and the caregivers' ratings show that adolescents with ASD have deficits in their conversational repair and presupposition abilities. In the discourse management domain, the TD adolescents performed significantly better than adolescents with ASD in the pragmatic areas of turn-taking, topic maintenance, and topic initiation. Yet, the caregivers did not detect differences between the two groups in these discourse management abilities. Moreover, the caregivers reported that adolescents with ASD have issues related to pragmatic behaviours, such as rejecting and terminating conversations; whereas, these difficulties were not found in the adolescents' performances. These variations may be the result of a number of social and environmental factors that may have facilitated their communication.

Conclusion. This study has significant implications for both ASD interventions and assessment. It provides a comprehensive assessment approach for measuring pragmatic skills, including both direct (participants' performances) and indirect (caregivers' perceptions) measures. Variations found in the adolescents' skills indicate that more personalised intervention programmes are needed to address their pragmatic difficulties and utilise their strengths. Future research may benefit from adopting the combined approach used in this study to explore pragmatics in ASD. Differences between caregivers' perceptions and the performances of individuals with ASD should be considered, as well as the influence of various factors on their communication.

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Terms and Definitions

Autism Spectrum Disorder (ASD): A lifelong developmental disorder involving deficits in social communication and social interaction, repetitive patterns of behaviour, and restricted interests and activities (APA, 2013).

Pragmatics Ability: The ability to use language appropriately in social contexts to serve communication functions by incorporating one's social knowledge with different contextual information and cues. Pragmatics ability includes both verbal skills, such as turn-taking and topic maintenance, and non-verbal skills, such as facial expressions and body language (Yule, 1996; Simmons et al., 2014).

Pragmatic Language Deficits: Deficits in mastering the social use of language, inability to use language in a way that is appropriate to the conversational context, difficulties in inferring and conveying the intended meaning of utterances, and inability to incorporate non-verbal and verbal skills (Adams, 2002; ASHA, 2016).

Discourse Management: The ability to follow the social rules of interaction within a particular conversational context, including, for example, the ability to take turns, maintain the continuity of the conversation by providing relevant information, and the ability to initiate a new conversational topic (Landa, 2005).

Communicative Function: The ability to initiate or regulate interaction to gain a specific purpose, such as request an object (Landa, 2000). The intended purpose of communication can serve a social (i.e., declarative) or non-social purpose (i.e., regularity).

Conversational Repair: The ability to identify and resolve a breakdown in conversation in order to avoid misunderstandings and to ensure the continuity and effectiveness of the exchange (Stirling et al., 2007).

Presupposition: Appropriate use of presupposition requires the ability to make assumptions about the needs of one's conversational partner and provide information that is quantitatively and qualitatively appropriate to the communication context and to the conversational partner,

including the ability to infer the appropriate type of language and topic and anticipate the appropriate amount of information (Landa, 2005; Volden, 2017).

List of Abbreviations

ASD	Autism spectrum disorder
TD	Typically developing individuals
DS	Down syndrome
SLI	Specific language impairment
YiPP	Yale *in vivo* pragmatic protocol
PPECS	Pragmatic profile of everyday communication skills
TROG	Test for Reception of Grammar
BPVS	British Picture Vocabulary scale
KBIT	Kaufman Brief Intelligence test
APA	American Psychiatric Association
ASHA	American Speech-Language-Hearing Association
CDC	Centres for Disease Control and Prevention
WHO	World Health Organization
NAS	National Autistic Society
NIH	National Institute of Mental Health
ANCOVA	Analysis of covariance
MANCOVA	Multivariate analysis of covariance

List of Symbols Used in Language Sample Transcripts

?	Rising intonation (not necessarily indicative of a question)
.	Fall at the end of an utterance (not necessarily the end of a sentence)
!	Animated tone
,	Slight rise in tone
(4)	Timed pause in seconds
(…..)	Unintelligible speech
(noise)	Non-linguistic events
(phone ring)	Non-linguistic events
(breathing)	Non-linguistic events
(laugh)	Non-linguistic events

(Adapted from Jefferson, 1984)

Chapter One: Introduction

1.1 Background

Autism Spectrum Disorder (ASD) is a complex developmental disorder characterised by deficits in social communication and interaction, along with restricted interests and repetitive behaviours (American Psychiatric Association, APA, 2013). These issues are interrelated and can negatively affect multiple aspects of one's life, including one's education and social and professional lives (Eaves & Ho, 2008). For example, in the UK, among 700,000 people with autism, 17% are children suspended from schools, while only 16% of the adults are employed and work in full-time jobs (Goddard, 2018). ASD also affects many cognitive functions, including the production and understanding of language. People with ASD suffer from noticeable deficits in their language skills, especially in terms of the social use of language for communicative purposes (i.e., pragmatics), such as maintenance of a topic, appropriate turn-taking, and conversational repair (Ying-Sng et al., 2018; Volden, 2017).

Pragmatic deficit is a hallmark of autism, unlike other language skills that vary from one individual with ASD to another (Tager-Flusberg et al., 2005; Volden, 2017). Volkmar et al. (1997) define pragmatics as the speaker's ability to use language properly in social contexts and the ability to organize thoughts, using the appropriate social code for the situation to create understanding for the listener. Knowledge of the symbols and rules of a language is not sufficient to converse successfully or to establish reciprocal social relations. These require the ability to understand the contextual cues and intentions of the participants in a conversation or social interaction, a complex ability that is more or less absent in people with ASD (Capps et al., 1998; Zufferey, 2015). Furthermore, some utterances have hidden functions and may contain highly-concentrated information, which relate to multiple functions, making spoken language particularly difficult to decipher for cognitively impaired people, such as people with ASD (Paltridge, 2006).

Language skills continue to develop throughout life and not all language skills develop at the same rate, pragmatic ability, for example, develops slowly and takes a long time to master, whereas lexis and grammar develop in early childhood (Hymes, 1972). Pragmatic deficit among people with ASD becomes clearer in adolescents and adults, as they

are more likely to have sufficient knowledge of other language skills, such as grammar and vocabulary (Baltaxe, 1977). Adolescence is a challenging stage for people with ASD (and their families). It is a period of considerable growth and development. During this stage of development, individuals often face difficulties in coming to terms with various cognitive, physical, and emotional changes (Trembath et al., 2018). During this period, autism traits, difficulties in social communication and social interaction, along with restricted and repetitive interests and behaviours act as barriers that prevent most people with autism from engaging in a variety of commonplace activities at home, school or socially in general (Trembath et al., 2018).

During adolescence, people with ASD become more aware of differences between themselves and typically developing (TD) peers. As one example of these differences, at this stage, TD adolescents tend to use more slang in their conversations whereas many people with autism use a more formal, pedantic style of speech, which is, in most cases, not appropriate to the conversational contexts (Whitmire, 2000). This causes them to be excluded from most social activities with peers and negatively affects their ability to make friendships and interact socially with others (Whitmire, 2000). Adolescence is also considered a transition period from childhood to adulthood (Seltzer et al., 2003). In this transition, people with ASD are challenged by the increasing "demands of social relationships, academics, employment, and independent living" (Kapp et al., 2011, p. 25). As they move into adulthood, they face different difficulties relating to supporting themselves, becoming more independent, making decisions about their education or their lives as well as attending higher education, accommodating to the workplace and engaging in social relations (Kapp et al., 2011).

Out of the many and varied problems that have been identified in relation to ASD, this study focuses on the pragmatic and conversational skills of adolescents with ASD in four basic areas: discourse management, communicative functions, conversational repair, and presupposition (more details in literature review chapter). Focusing on these four pragmatic skills derives from the fact that they are the skills a person needs in order to conduct a successful conversation and interact with others (Simmons et al., 2014; American Speech-Language-Hearing-Association, ASHA, 2019). These skills are aligned with the ASHA (2019) definition of pragmatic language as the appropriate use of language in terms of selecting and managing topics, taking turns, expressing politeness, repairing breakdowns,

understanding social roles, achieving social goals and identifying other interlocutors' needs in conversations (Simmons et al., 2014; ASHA, 2019). Additionally, impairments in these four skills are the most common problems with pragmatics in the population with ASD (Capps et al., 1998; Paul, 2001; Tager-Flusberg et al., 2005; De Villiers et al., 2007; Paul et al., 2009).

This study centres on the pragmatic and conversational abilities of Arabic-speaking adolescents with ASD in Saudi Arabia a population that has yet to be studied in this area. Pragmatic language and social communication are human behaviours that are closely related to social context and are influenced by cultural variations. The use of different pragmatic behaviours—such as speech acts, politeness, addressing terms, and discourse rules—are considered universal phenomena; yet, each language has its own ways of expressing pragmatic behaviours (Farghal & Almanna, 2014). For example, people's use of different discourse rules—such as topic choice, turn-taking, and interrupting during conversation—is typically controlled by cultural rules (Norbury & Sparks, 2013). The ability to understand the intentions of a speaker (e.g., whether they are sarcastic, formal, or polite) is primarily based on one's social experience of communication (Young et al., 2005). In expressing politeness, what may be acceptable and polite in one culture is not necessarily so in another culture (Lakoff, 1972).

Arab countries, and particularly the Saudi context, are characterised by substantial cultural differences with Western countries. In Arab culture for example, when responding to compliments, it is common to reply by offering the complemented item to the speaker, as a courtesy or praise in return, an uncommon response in Western culture (Farghal & Almanna, 2014). Relating to pragmatic language use, in English for example, Western people tend to use apology a lot using direct speech acts, such as *sorry* or *excuse me*, whereas in Arabic, people tend to give more explanations and justifications as basic indirect apology strategies. In a study by Ghawi (1993), he investigated pragmatic transfer in Arabic students who learn English as a second language in America and found that some Arabic participants think that the constant use of apology by American people is more of a routine than sincere apology. Likewise, some Americans see that providing explanation, as an apology act, is an avoidance strategy. He concluded that it is important to focus on cultural differences when investigating pragmatic language as these differences might cause miscommunication (Ghawi, 1993). In contrast to using direct apology speech acts in English, indirect speech acts are used for requests and orders, such as using a statement like '*it is hot in here*' to request the listener to

open the window (Farghal & Almanna, 2014, p. 94). In Arabic also, people tend to use indirect speech to express a greeting or thanks. Religious phrases, such as "Thank God," are used in reply to questions, such as "How are you?" and "God bless you" is a way of saying thank you (Al-Zoubi & Al-Hassnawi, 2001, p. 22; Farghal & Almanna, 2014).

1.2 Problem Statement

The prevalence of ASD is rising across the globe; however, many aspects of the disorder are still poorly understood (Oller & Oller, 2010), especially in Arab countries, with negative impact on the ability of parents, educators, and clinicians to help people with ASD. There is a paucity of ASD literature on Arab countries compared to Western countries, where most research on ASD has been conducted. Studies in the area of pragmatics, a significant impairment among people with ASD, have yet to examine Arabic-speaking ASD adolescents, particularly in the Saudi context. Furthermore, current instruments and tests for measuring pragmatic competence and diagnosing pragmatic deficits in people with ASD are not available in Arabic (to our knowledge) nor are they adapted to Arab culture for use in Arab countries. The lack of such tests and instruments negatively affects the ability to assess and evaluate pragmatic language function among people with ASD in Arab countries and effectively address their impairments. In fact, disorders such as autism are not directly related to a specific culture or language, but culture has a significant influence on pragmatic conventions (Leech, 1983). To cooperate successfully with others in their cultural and linguistic environment, people require efficient pragmatic skills that are appropriate for their specific situation (McKibbin & Hegde, 2011).

Many studies in the fields of linguistics and psychology have focussed on the pragmatic and conversational characteristics of individuals with ASD (Ozonoff & Miller, 1996). However, most studies have focussed on the pragmatic and linguistic difficulties of children with ASD, rather than adolescents or adults (Barnhill et al., 2015; Trembath et al., 2018). Adolescents tend to be exposed to more social demands than children are, which requires more advanced pragmatic skills. The complexity of social relations and expectations is increasing at this stage, which requires more developed social and language skills (Trembath et al., 2018). For individuals with ASD, being in situations that demand social interaction often makes them uncomfortable and anxious and therefore they tend to avoid social interactions (Baron-Cohen, 1988; Barnhill et al., 2015).

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Although adolescence is an important and critical stage with a lot of challenges for people with ASD, little data and few studies exist that attempt to understand this transitional period in the lives of individuals with ASD in terms of their strengths, weaknesses, challenges and needs (Barnhill, et al., 2015; Trembath et al., 2018). There is a need for more investigations of different social, communication and language skills across different stages of development among people with ASD, including adolescents (Matson & Neal, 2009). Adolescents with ASD require attention, services and support, especially with regard to their language, communication and psychological and employment needs (Seltzer et al., 2003).

Finally, as it is commonly known, measuring pragmatic language ability is a difficult task, as pragmatics refers to language in context, which is difficult to measure directly (Adams, 2002; Volden et al., 2009). Multiple instruments have been developed to evaluate pragmatic and conversational skills among different populations including direct measures of the actual behaviour of the participants themselves, and indirect measures collected from parents, teachers, clinicians and caregivers of the participants. Direct measures such as observations and conversations provide in-depth analyses of participants' language skills and real language performance highlighting contextualised pragmatic skills that are not captured by other standardised tools (Fenson et al., 1994; Paul, 2001; Tager-Flusberg et al., 2009). Whereas, the indirect measures such as parents' questionnaires, is useful in providing rich insights into participants' daily behaviour in an authentic environment, home or school without being affected by any variations that may occur in participants' behaviour from day to day (Bishop & Baird, 2001; Charman, 2003; Constantino et al., 2003; Volden & Phillips, 2010). In fact, both tools are useful measures in assessing pragmatic language and identifying language deficit and in order to develop a more comprehensive understanding of these abilities, it is advisable to employ multiple measures and different perspectives when evaluating pragmatic impairment in the ASD population (Condouris et al., 2003; Volden et al., 2009).

Despite these various indications in the literature pointing to the benefits of combined approaches in assessing pragmatic and conversational skills, to our knowledge only a small number of studies (Reichow et al., 2008; Volden & Philips, 2010; King & Palikara, 2018) have directly combined caregivers' estimations of individuals' pragmatic abilities with those same individuals' actual performance. To address this methodological limitation when evaluating pragmatic skills in ASD, multiple instruments and different sources of information

should be used. A comprehensive assessment of pragmatic skills should include both direct and indirect measures. Both the person with ASD and the people interacting with them should be included in the assessment and intervention (Parsons et al., 2017).

1.3 Significance of the Study

This study focuses on understanding the nature of the pragmatic and conversational skills of adolescents with ASD in Saudi Arabia in order to better help develop their language, communication, and social skills and, thus, help improve their quality of life. Language specific studies on the pragmatic skills are necessary because pragmatics is closely related to culture (Reichow et al., 2008), and cultural variations must be considered when investigating pragmatic language skills, in the design of new tools and the adaptation of existing tools, so as to avoid cultural bias (Carter et al., 2005). Therefore, this study aims to address this gap by investigating specific pragmatic abilities observed in the language of Arabic-speaking adolescents with ASD and provide a knowledge base for the development of interventions to improve their pragmatic and the conversation skills and further research in this area. This gap is also addressed by translating, adapting, and developing tools to measure and evaluate pragmatic competence and impairment in Arabic to provide a means for the accurate evaluation of Arabic speakers with ASD. In this study, existing English language tools, including the Yale *in vivo* Pragmatic Protocol (YiPP) (Simmons et al., 2014) and the Pragmatics Profile of Everyday Communication Skills in Adults (PPECS) (Dewart & Summers, 1996), were translated and adapted to provide a means for the accurate evaluation of Arabic speakers with ASD.

Communication impairment and pragmatic language deficit negatively affect the social relationships of people with ASD. This deficit, especially in conversational skills, is a major challenge facing people with ASD, and adolescents in particular, as at this stage of development making friendships and engaging in conversations are of particular importance and value (Whitmire, 2000). To understand language use competence, the assessment of pragmatics in adolescence is as necessary as it is in childhood because pragmatic skills are still being acquired in adolescence. This study attempts to obtain data on the pragmatics and the conversational difficulties of adolescents with ASD, which will further our understanding of the different difficulties that these adolescents experience and therefore contribute to the existing literature in the pragmatic development of individuals with ASD and in particular adolescents within the disorder.

Furthermore, this study addresses a model for exploring pragmatic skills in ASD where multiple sources of information and a combination of techniques were used to assess the conversational and pragmatic abilities of the participants. The study included a questionnaire for caregivers and conversations with the participants themselves to assess their performance. This combination was used to gain a better understanding of the subtle and complex issue of pragmatic skills in adolescents with ASD through an examination of the similarities and differences between the participants' performances and their caregivers' perceptions. Such multi-method approaches may be the most accurate way to assess and investigate linguistic and pragmatic abilities of individuals with ASD (Luyster et al., 2008).

The location of the study in Saudi Arabia and the focus on Arabic language add a cultural dimension to the study that extends the existing knowledge base about pragmatics and autism. This study provides a model for research of ASD in Arab countries and beyond by including both direct measures of Arabic-speaking adolescents with ASD and indirect measures of their caregivers' perceptions. This study also addresses the lack of tools to evaluate pragmatic competence and impairment in the Arabic language and develop guidelines that can be used in practical ways and applied in different intervention programmes for adolescents with ASD. Findings of this study may contribute to understanding language development among adolescents with ASD and provide an important reference for parents, clinicians, and educators.

1.4 Research Aims

The overall aim of this study was to identify the pragmatic and the conversational abilities of adolescents with autism spectrum disorder (ASD) and compare them to the language skills of typically developing adolescents (TD) in Saudi Arabia.
The study was guided by the following specific aims:

- To identify the conversational skills of Saudi-Arabian adolescents with ASD and compare them to those of TD adolescents—in terms of discourse management, communicative functions, conversational repair, and presupposition—based on a direct assessment of their skills.

- To identify the conversational skills of Saudi-Arabian adolescents with ASD and compare them to those of TD adolescents based on the perceptions of their caregivers.
- To clarify the similarities and differences of the pragmatic language characteristics of adolescents with ASD based on their performance and their caregivers' perception.

1.5 Research Questions

In order to achieve the research aims, conversational and pragmatic abilities were first identified in individuals with ASD using different assessment methods and then compared to their TD peers. Caregivers' perceptions were then collected and compared to the assessment results. Specifically, the following research questions were addressed:

1. What are the differences between the conversational skills of Saudi-Arabian adolescents with ASD and TD adolescents in terms of their:
   - discourse management ability?
   - communicative function ability?
   - conversational repair ability?
   - presupposition ability?
   - other pragmatic abilities?

2. What are the differences between the conversational skills of Saudi-Arabian adolescents with ASD and TD adolescents based in their caregivers' perspectives in terms of the same mentioned abilities?

3. What are the similarities and differences between the perceptions of the caregivers and the observed strengths and weaknesses of the ASD participants' pragmatic and conversational abilities?

1.6 Research Hypotheses

- In line with earlier findings in other languages, Saudi-Arabian adolescents with ASD were expected to lack some of the pragmatic and conversational abilities of TD adolescents with respect to discourse management, communicative functions, conversational repair, and presupposition.

- The caregivers' perceptions were expected to highlight the ASD adolescents' lack of some of the TD participants' abilities.

- The perceptions of the caregivers were expected to align systematically with the observed strengths and weaknesses of the ASD adolescents' pragmatic and conversational abilities.

1.7 Organization of the Dissertation

The dissertation is presented in six chapters as follows:

- **Chapter one (the current chapter)** gives an overview of the general background concerning autism and pragmatics. Gaps in the literature and the statement of this research problem are discussed with a provision of the significance and the importance of this current research and how the study intends to address these issues. Then, it states the research aims, questions and hypothesis.

- **Chapter two** reviews the available literature to develop the conceptual framework for the study by providing a comprehensive review of the key literature involving four main aspects related to this research, pragmatic language, autism spectrum disorder ASD, pragmatic language difficulties in individuals with ASD and autism in Saudi Arabia (the context of the current study). First, it starts with review the literature on pragmatic language presenting different topics related to pragmatic studies, such as pragmatic competence, its definitions, pragmatics and its relation to culture and pragmatic development through different developmental stages (childhood and adolescence). Then different pragmatic theories are explained, including speech act theory, Grice's cooperative principle, politeness theories and relevance theory. Second, the chapter provides an overview of autism, presenting its history and definitions, its prevalence rate around the world, possible causes of ASD and diagnosis criteria and core features. The chapter concludes by focusing on pragmatic language difficulties in the speech of individuals with ASD. It presents different conversational difficulties of individuals with ASD and summarises different cognitive theories that might explain this pragmatic deficit in autism, namely theory of mind deficit, weak central coherence and executive dysfunctions theory. This is followed by a discussion of the effect of conversational partner and interaction environment on the pragmatic performance. Then, different tools and assessments

used in measuring pragmatic skill are discussed and issues relating to these measures are explained too. Finally, a theoretical background about autism in Saudi Arabia (study context) is presented in terms of its prevalence in the country, support and services for individuals with ASD and presents some existing issues relating to diagnosis, families and public awareness, and research in Saudi Arabia.

- **Chapter three** describes the methodology of the study and the process that was used to collect data to address the central research issue. It is divided into two main sections; one is about the research sample and the other discusses the research design. The first section presents the characteristics of the research samples, namely, adolescents with ASD and TD adolescents and their caregivers. It also describes how these participants with ASD and TD participants were matched, this includes a description of the tests that were used for matching purposes. In the second section, the study design is explained by identifying the study's methodological approach, which is a mixed-method approach to allow data to be gathered from both quantitative and qualitative sources. The main tools used to collect the required data in this research are also described in detail, namely, questionnaire (PPECS), semi-structured conversation (YiPP) and natural language sample. Then the data collection procedure and the required ethical considerations that accompanied data collection are described. Also, this section describes the settings of the study, the approach used to translate the study's tools, piloting study procedures, different analysis techniques and finally validity and reliability issues.

- **Chapter four** includes a full explanation of the study results and findings supported by the different analysis techniques used in this study. First, quantitative analysis of two tools examining participants' performance (YIPP) and caregivers' perceptions (PPECS) were conducted using different statistical tests. This analysis was performed on two levels of analysis. The first level analysed the main pragmatic domains of each tool, and, on the other level, items analysis, a more detailed analysis of each pragmatic behaviour included in the main domains was performed. Second, the other section of this chapter presents qualitative data from the discourse analysis of the participants' free conversation, including a summary of the theoretical framework of the analysis, and an explanation of the different pragmatic difficulties found in the

participants' conversations supported by some examples of speech from both TD and adolescents with ASD.

- **Chapter five** discusses the main research findings about pragmatic and conversational difficulties derived from the analysis of both participants' conversations and caregivers' questionnaires. These findings and new data are discussed in relation to the research hypotheses and in the light of relevant literature to provide answers to the research questions.

- **Chapter six** presents the study conclusions by summarising the main findings and their contribution to the field of autism and pragmatic studies. It also highlights the research's limitations and identifies open issues and makes suggestions for future research.

Chapter Two: Literature Review

2.1 Introduction

This chapter provides an overview of literature in the areas of pragmatics and autism. The chapter is divided into four main sections. In the first section, an overview of pragmatic language is presented, including definition, conversational skills, pragmatics and culture, and competence. Key pragmatic theories are discussed to explain different pragmatic abilities, followed by an outline of pragmatic development in childhood and adolescence. In the second section, an overview of Autism Spectrum Disorder (ASD) as a developmental disorder is presented, including definition, diagnosis and core features, special abilities associated with ASD, aetiology, and prevalence. In the third section, pragmatic deficits in individuals with ASD, and related topics, are discussed, including common pragmatic difficulties, cognitive theories related to autism and measurement of pragmatic abilities. Finally, in the fourth section, an overview of the context of the current study is presented (i.e., ASD in Saudi Arabia), in terms of the support and services available to individuals with ASD, the challenges of ASD diagnosis and research, and the lack of awareness among families, teachers, and the public about ASD in Saudi Arabia.

2.2 Pragmatic Language

2.2.1 Background

In order to use language appropriately, the ability to produce grammatically correct utterances is important but not sufficient; utterances must also be appropriate to the context of the communication. For communication to be effective, social knowledge and the ability to process different social cues are as important as linguistic knowledge (Murza & Nye, 2013). As such, being a skilled language user requires "knowing how to use one's language appropriately and strategically in social situations" (Bryant, 2005, p. 191). The term "pragmatics" denotes the ability to use language appropriately in social contexts for communication purposes (Volkmar et al., 1997). The term was initially used in the fields of semiotics and the philosophy of language before extending to other disciplines and becoming an important branch of linguistics (Morris, 1938). Pragmatics comprises a mix of cognitive

abilities and stored information, which include the knowledge of other minds as well as knowledge about the social and physical situation (De Villiers et al., 2007a).

Pragmatics is the study of meaning and its association with the context of communication and how the intended meaning is produced by the speaker and understood by the receiver (Yule, 1996). This study of language use focuses on the importance of context and its role in facilitating comprehension and expression and how the interaction between these contextual factors and linguistic meaning help people to understand the intended meaning (Loukusa et al., 2018). Pragmatics research generally aims to determine the rules that control the use of language in daily communication and how users use language for the purpose of communication (Pütz & Aertselaer, 2008). The appropriate use of language includes both verbal and non-verbal aspects of communication (Murza & Nye, 2013). Verbal abilities include managing discourse, using cohesive devices, and using different styles; whereas the non-verbal abilities refer to the use of facial expressions, eye contact, and body language (Grice, 1975; Kasher, 1991). Pragmatics also includes the ability to use speech acts appropriately, such as requests, questions, promising, and congratulating (Kasher, 1991; Zufferey, 2015).

Pragmatics shares a close relationship with syntax (i.e., the study of the rules used in the formation of phrases and sentences in languages) and semantics (i.e., the study of the classification and change in basic word meaning; Yule, 1996). However, it is the only sub-field of linguistics that places human users of language at its centre. The advantage of studying language through pragmatics is that it examines speakers' intended meanings, assumptions, purposes, and goals as well as language users' linguistic choices, their impact on other users, and the constraints they face when using language to communicate (Yule, 1996; Crystal, 1997). Yule (1996) confirms that pragmatics, in general, makes for an interesting and fruitful source of study. Yet, the study of pragmatics has disadvantages, as it deals with human concepts (e.g., intentions, assumptions, purposes), which can be difficult to analyse in a consistent and objective manner, removed from the communication context (Yule, 1996). For example, in a conversation between two friends, the listener may infer the speaker's intended meaning without receiving linguistic clues about the meaning conveyed, as the following example demonstrates:

"Her: So–did you?

Him: Hey–who wouldn't?"

(Yule, 1996, p. 4)

One of the most interesting features of spoken and written communication is how the receiver interprets meaning and understands more than what is said, depending on the context of communication. Yet, instances such as the one above pose a challenge for researchers who want to ascertain the communicator's underlying intentions (i.e., what they have in mind; Yule, 1996).

2.2.2 Pragmatics and context

Pragmatic ability entails combining language and contextual information in order to communicate (Chaban, 1996). Contextual information influences the interpretation and understanding of the meaning of expressions and language used in communication (Yule, 1996; Loukusa et al., 2007). In fact, it is not possible to make a list of the different meanings of a particular utterance and determine what specific meaning can be accepted in the utterance's context, but instead the interaction of the context and the utterances is what helps in the emergence and the interpretation of intended meaning (Bilmes, 1986). Context is a dynamic, continually-changing surroundings in which certain events occur that allow participants involved in communication to interact and make their linguistic utterances intelligible and meaningful (Bilmes, 1986; Mey, 2001). It involves several dimensions, including linguistic and non-linguistic aspects, such as cultural, cognitive, physical, and social aspects (Prutting 1982; Sperber & Wilson 1995; Mey, 2001).

The context of communication involves the linguistic context (i.e., verbal information, including preceding and subsequent utterances in discourse); the social context, including the speaker's and listener's relationships and social statuses; and the physical environment (i.e., communication place and time, including objects that exist and actions that occurred in the context; Prutting, 1982). However, according to Sperber and Wilson (1995), the context is not only limited to the immediate physical and linguistic environment but also includes other assumptions from the hearer's side that help in the interpretation of different utterances. These assumptions include "expectations about the future, scientific hypotheses or religious beliefs, anecdotal memories, general cultural assumptions, [and] beliefs about the mental state of the speaker" (Sperber & Wilson, 1995, p. 15-16). Therefore, the relationship between the context (social, physical, or linguistic) and the expressed words and the effect of

context on what is said and how it is understood is a key aspect that must be considered in understanding pragmatics.

2.2.3 Conversational skills

Conversation is an essential human activity that can be observed almost anywhere. It is a form of communication that occurs to satisfy different needs, including instrumental goals, such as asking for an object or making requests, as well as social goals, such as social reciprocity and communication (Hutchison et al., 2019). Conversations are not merely symbols and words connected together. They are utterances of interrelated expressions between two or more speakers, which are said in a certain order, in a specific manner, and for a particular goal. According to D'Hondt et al. (2009), participants in a conversation continuously negotiate the participation framework during encounters as their talk proceeds. Conversations cannot simply be described as exchanges between speaker and listener. Rather, participants' "co-presence" has several complex implications for the resulting language output and the general conversational exchange, such as in signalling turn-taking (Downes, 1998). Thus, in a conversation, participants are required to share a joint focus of attention, managing turns in an appropriate manner and providing related information to the topic of the conversation to keep the conversation flowing (Veneziano, 2014).

Conversational skills involve using language for various purposes, producing organised and clear language, and considering the needs of the other conversation interlocutors. These skills also include the proper use of conversation strategies, such as register and inferences; mastering the underlying rules of conversations, such as initiation and maintaining conversation; using different communication functions, such as requesting and rejection; and requesting clarification and using repair in the event of a misunderstanding (Veneziano, 2014).

Many factors affect how a conversation functions and the utterances used in it. For example, the relationship between conversational interlocutors may affect how each chooses their utterances. The relationship may include the desire to be polite, formal, or informal, all of which affect the conversation. The age of the speakers and their linguistic competences also affect the choice of language in the conversation. For example, when adults talk to children, they choose simple words to make it easier for them to understand, unlike the language they choose when they speak to other adults. Insofar as the context of an utterance

shapes the output formed by a speaker or writer, the relative social, physical, or conceptual distance between speaker/writer and hearer/reader fashion the output further (Yule, 1996; Volkmar et al., 1997).

2.2.4 Pragmatics and culture

Culture is a key factor affecting the parameters that speakers set in the construction of well-formed utterances, since many of the key aspects of verbal communication are culture specific (Kecskes, 2013). Pragmatic skills are significantly connected to culture, and speakers engaging in intercultural communication will not be able to rely on the same set of assumptions with regards to their spoken output as speakers interacting in the same cultural setting (Leech, 1983). Nibun and Wigglesworth (2014) found that a child learning both German and Japanese as their first languages displayed different pragmatic markers according to the language. The participants in their study used each language differently, depending on several factors, such as the "child's lexicon, habitual language use, parental discourse style, and the language dynamics surrounding the child" (p. 76).

According to Leech (1983), speakers produce language in various ways in different language or culture societies. Leech (1983, p. 10) also highlights the importance of "the sociological interface of pragmatics" in explaining the way different rules work in different communities. Interlocutors need to pay attention to the key socio-cultural foundations that are relevant to a given cultural context in producing language (Ariel, 2010). Speaker-hearers seek to produce language that is appropriate to the general socio-cultural environment and usually anticipate the type and amount of information that is appropriate and adequate in a specific situation. This anticipation plays an important role in pragmatic explanations; for example, in the context of role-playing or turn-taking, sociocultural parameters may influence what is viewed as acceptable and/or appropriate output (Zufferey, 2015).

2.2.5 Pragmatic competence

Pragmatic competence is the ability to use and interpret language in a way that is appropriate to the context and social relationships (Thomas, 1983); it refers to the ability to use language for different functions and purposes, knowledge of the cultural aspects of the language, and appropriate use of the language in specific contexts (Thomas, 1983; Bialystok, 1993). According to Penn, (1999) pragmatic competence encompasses knowledge of the

language and its rules, knowledge of the world around the person, and social knowledge, including the rules that control social interaction between people in a specific culture. According to the American Speech-Language-Hearing Association (ASHA, 2019), pragmatic competence, and effective use of pragmatics, includes three main communication abilities: the ability to use language for different purposes, such as greeting and requesting; to change language and adapt speech and tone depending on a listener's needs or a situation; and to follow the rules of conversations, such as turn-taking, sustaining a conversation, and providing an appropriate amount of information in keeping with the listener's knowledge (ASHA, 2019). However, despite the universality of these three main abilities, the ways of expressing them and the degree of their priority varies across different cultures. A person's experiences of communication in different communities is affected by their understanding of cultural conventions and rules of communication in a particular society. This understanding is helpful, for example, in recognising the intentions of speakers, using appropriate language for a situation and other interlocutors, following appropriate rules in communication, such using addressing terms, following turn taking and interrupting and even determining appropriate physical distance between partners (Lakoff, 2004; Zufferey, 2015).

Researchers differ in their views of pragmatic competence. Some consider it one of the central components of general communicative competence, an aspect of communicative competence alongside other competences, such as grammatical and psycholinguistic competences (Thomas, 1983; Savignon, 1991). Other scholars, such as Candlin (1976) and Schmidt and Richards (1980), equate pragmatic competence with communicative competence and use them interchangeably. Prutting (1982) considers pragmatic competence as equal to social competence and stresses the importance of the relationship between pragmatics and the social context. Similarly, Windsor (1995) agrees that language is the main tool of social communication and using it properly is a social skill. To gain advanced social skills, it is important to have proper pragmatic language skills, as pragmatic competence supports and facilitates social skills (Wiseman-Hakes et al., 1998).

This brief overview of pragmatic definitions and other related concepts, such as pragmatic competence, context, and culture, will further the understanding and serve as the background of the next section, which presents and discusses a number of important pragmatic theories.

2.2.6 Pragmatic theories

Many theories in the field of pragmatics have affected its development and provide the basis for understanding pragmatic language skills. The following key theories are discussed in detail below, the speech act theory (Austin, 1975; Searle, 1979, 1985), the cooperative principle (Grice, 1975), the politeness theories (Lakoff, 1972; Leech, 1983; Brown & Levinson, 1987) and the relevance theory (Sperber & Wilson, 1986; 1995).

2.2.6.1 Speech-act theory

According to speech-act theory, language is not only a means of conveying or expressing information but also a means of doing things and performing actions. People use language to perform actions or influence others to perform certain actions (Austin, 1975). This language use is called a "speech act" and denotes different acts, such as apologising, requesting, promising, or inviting (Yule, 1996). Speech-act theory is considered one of the earliest and key theories in the study of linguistics. It was first developed by Austin in a series of lectures that he delivered at Harvard University in 1955, which were later collected in a book entitled, *How to do things with words* (1962, 1975). Austin's theory was further developed by Searle (1979, 1985). The speech-act theory was originally used in the field of the philosophy of language but later became widely used in linguistics as well. It is a pragmatic theory and includes consideration of the intentions of the speaker and the inference of the listener (Birner, 2013).

Austin divided utterances into "performatives" and "constatives". According to Austin "the performative should be doing something as opposed to just saying something" (Austin, 1975, p. 133). By using performative utterances, individuals actually perform an act by uttering certain words; the words are not used to describe or report something but rather are used to incite action (Austin, 1975). Examples of performative speech acts are apologising and promising (e.g., "I apologise" and "I promise"). By uttering these words, the speaker is actually performing the act of apologising or promising, not simply describing the act. Performative utterances can be explicit or primary (implicit). The explicit performative is an utterance that includes a performative verb (e.g., "I promise that I shall be there"); these verbs both indicate and name the specific required actions, while the implicit performative does not include a performative verb (e.g., "I shall be there"; Austin, 1975, p. 69). However, both utterances imply the same act, which is promising.

On the other hand, constative utterances are declarative utterances that describe something and convey facts; they do not incite an action (Austin, 1975). Constative utterances can be true or false; for example, in an utterance such as "He travelled yesterday", it is easy to determine whether the statement is true or false (Austin, 1975). According to Austin (1975), performative utterances cannot be true or false but instead can be felicitous or infelicitous. Austin coined the term, "felicity conditions" to describe the specific requirements and rules related to the utterance's context and intention, which must be met to achieve the purposes of a speech act and to identify its appropriateness and felicity (Austin, 1975; Birner, 2013). Felicity conditions include, a preparatory condition (i.e., the appropriateness of the speech act circumstances and its participants); an executive condition (i.e., the appropriateness of the execution of the speech act); a sincerity condition (the sincerity of the speaker when they utter the speech act); and a fulfilment condition (i.e., "the perlocutionary effect of the speech act"; Allan, 1998, p. 6).

Austin, in a later lecture, rejected his distinction between performative and constative utterances because he realised that even constative verbs perform an act of stating (Austin, 1955; 1975). He replaced this distinction with a more general speech act theory. According to his revised theory, every utterance has three related acts: a locutionary act (i.e., the actual uttering of an expression); an illocutionary act (i.e., the intention or the force of the speaker); and a perlocutionary act (i.e., the results or effect of the utterance on the hearer; Austin, 1975). These three acts work together simultaneously and cannot be performed separately. However, since the illocutionary act is the most noticeable of the three, the term "speech act" often refers to the illocutionary act (Yule, 1996).

Searle (1985) further added the classification of speech acts according to their general function and structure. According to Searle's taxonomy, speech acts can be divided into five categories depending on their function: representatives, commissives, directives, declarations, and expressives. In a representative speech act, the speaker commits "(in varying degrees) to something's being the case, to the truth of the expressed proposition" (Searle, 1985, p. 12). In a commissive speech act, the speaker commits (in varying degrees) to a future action, such as promising or offering. In a directive speech act, the speaker tries (in varying degrees) to make the hearer do an action, such as in requesting or advising. The declaration speech act implies the successful performance of the acts; it arises from "the correspondence between the propositional content and reality" (Searle, 1985, p. 16), such as in hiring and arresting.

Finally, in an expressive speech act, the speaker expresses a psychological state, such as in greeting and congratulating.

According to Searle (1985), a speech act can also be direct or indirect. An utterance can be used to perform another illocutionary acts in addition to its main illocutionary act. The distinction between direct and indirect speech acts can be made by identifying the relationship between the main sentence types and their communication functions. In other words, identifying the relationship between different types of sentences (statement, question, or command) and their communication functions (declarative, interrogative, or imperative; Yule, 1996). A speech act is considered direct if there is a direct relationship between a sentence structure and its function, such as a declarative sentence used to make a statement; whereas an indirect speech act has a structure and function that are not directly related, such as a declarative structure used for a command or question (Yule, 1996). A declarative sentence, such as "It is cold outside" could be a direct speech act stating the weather condition (Yule, 1996, p. 55). It could also be a request or a command to close the door or the window; in this case, it is an indirect speech act. The classification depends on the context in which the statement is uttered.

2.2.6.2 Cooperative principle

Speech act theory, particularly Searle's idea of direct and indirect speech acts (1985), led the way to Grice's cooperative principle (1975). Grice views conversation as a cooperative effort. The cooperative principle focuses on the speaker's intention and the implied meaning of an utterance beyond its literal meaning as well as how the listener infers and understands the speaker's implied meaning even if it is not clearly stated. It postulates that people in conversations assume they are cooperating to reach a proper end. According to the cooperative principle, a conversational participant should make their "contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which [they] are engaged" (Grice, 1975, p. 45).

This cooperative principle consists of implicit rules that monitor language use in conversations. These rules or "maxims" are not based on arbitrary assumptions about how conversations should be, but instead they are rational rules for conducting interactions in a cooperative manner and providing a comprehensive set of guidelines for the effective use of language in conversations (Grice, 1975). Grice (1975) identifies four maxims, quantity,

quality, relation, and manner. The quantity maxim is the amount of information participants provide in a conversation; it should be sufficient for the exchange purpose. The quality maxim refers to the truthfulness of the participants in terms of what they say in a conversation; the participants in a conversational exchange are expected to be honest. The relation maxim states that the contributions should be relevant to the topic of the discussion. Finally, the manner maxim is concerned with the appropriate style, clarity, and order of the conversation.

Grice's maxims are not strict rules for conversations, which should be obeyed and followed all the times; people may fail to observe a maxim at times, either intentionally or accidently. According to Grice (1975), failure to observe the maxims can be occur in four ways, namely flouting, violating, infringing, and opting out. Flouting a maxim occurs when a speaker disregards a maxim in an obvious manner to direct the listener to an inferred or hidden meaning; whereas, violating a maxim occurs by not observing it "quietly and unostentatiously" (Grice, 1975, p. 49), which may mislead the listener and impede their attempt to infer the implied meaning. Infringing on a maxim occurs when a speaker does not observe it without intention of implying another meaning or deceiving the listener. Finally, a speaker is opting out when they are unwilling to collaborate as required (Grice, 1975).

Different ways of flouting these maxims generate what Grice calls "implicatures": the speaker's implied meaning beyond the literal meaning of the words uttered, a meaning that is not explicitly stated and needs to be inferred by the listener (Grice, 1978; Grundy, 2013). For example, flouting the quantity maxim (be as informative as required) by using a general term such as *flowers* to refer to a particular type of flower, in a context such as a garden that contains many types of flowers, could lead the listener to infer that the speaker does not know the name of this type of flower; or they may infer that there is some aspect of the interactional context, such as a previously mentioned reference, which removes the ambiguity of this under-informative expression (Davies & Arnold, 2019). The importance of Grice's cooperative principle and maxims is not only in prescribing how proper conversations should be but rather in explaining and considering these conversational implicatures (Davies & Arnold, 2019).

The cooperative principle has been used in many studies to investigate pragmatic phenomena across different populations, such as typically developing children or children with developmental disorders (e.g., Bishop & Adams, 1989; Surian et al, 1996); however, it

is not without limitations. According to Davies (2000, p. 23) the main limitation of this theory is that "it is based on introspection rather than data and takes no account of interpersonal factors". Others argue that the maxims are very general and there is some ambiguity in their explanation (Sperber & Wilson, 1995). A number of researchers have tried to resolve these limitations by providing further explanations to Grice's model. Such attempts are found in the politeness theories of Lakoff (1972), Leech (1983), and Brown and Levinson (1987), and the relevance theory of Sperber and Wilson (1986; 1995), reviewed below.

2.2.6.3 Politeness theories

Politeness can be interpreted as an underlying motivation of an individual's linguistic behaviour and a genuine desire to be pleasant and acceptable to others (Thomas, 1995). The concept of politeness is related to the appropriateness of an utterance within a culture, which can be defined by the general norms and principles that speakers in a society usually follow in their interactions, such as being considerate, generous, tactful, and sympathetic to others (Yule, 1996). Politeness has been the focus of many studies in the field of pragmatics. Numerous researchers have attempted to conceptualise the idea of politeness and have contributed to its theoretical discussion, resulting in several theoretical approaches to politeness (Inagaki, 2007). Three of the most influential theories of politeness were proposed by Lakoff (1972), Leech (1983), and Brown and Levinson (1987).

According to Lakoff's model of politeness (1972), the idea of politeness is closely related to culture and expressing politeness varies from culture to culture and from language to language, and what may be considered polite among speakers in a particular culture may be considered rude or foolish in another culture. Although there is a universal definition of politeness, questions of when to be polite, to what extent, and what linguistic choices and devices are appropriate to express politeness (e.g., when and how to behave as though one's status is lower than the addressee) may vary in different language and cultures (Lakoff, 1972). Therefore, to choose the appropriate form and degree of politeness in any conversation, it is important to consider different contextual aspects, including the social status of the participants, the social situation of the conversation, the speaker's beliefs and knowledge; and not depend on the syntax of the utterances alone (Lakoff, 1972).

Lakoff outlines three rules of politeness, "Formality: keep aloof"; "Deference: give options"; and "Camaraderie: show sympathy" (Lakoff, 2004, p. 88). Applying the first rule

(i.e., formality) involves creating a distance between the speaker and the listener and avoiding interference in the other's business. An example of this rule is the use of passive voice to avoid the direct involvement of the speaker (Lakoff, 2004). The second rule (i.e., deference) concerns giving the listener the choice of how to react and what to do by, for example, showing hesitation and using hedges (i.e., words that have a vague meaning to modify the force of utterances; Lakoff, 2004). An example of being polite by using hedges is saying "John is *sorta* short" instead of saying directly "John is short" (Lakoff, 2004, p. 89). The third rule of politeness (i.e., camaraderie) refers to showing sympathy and interest and being friendly to the listener by using nicknames or their first name in the correct situation (Lakoff, 2004). It is possible for a speaker to be aloof and respectful at the same time, combining the first and second rules; and it is possible to be respectful and friendly, combining the second and third rule. However, the first and third rules "are mutually exclusive" and cannot occur simultaneously, since the speaker cannot be aloof and friendly at the same time (Lakoff, 2004, p. 89). While these three rules are universal, the order of their priority and the conditions of their occurrence vary according to different cultures or speech communities (Lakoff, 2004).

Leech's (1983) theoretical approach to politeness, the *politeness principle*, supports Grice's cooperative principle and considers its rules for conversations rational; yet, Leech argues that Grice's model is insufficient and requires further explanation. Leech claims that the politeness principle is an essential complement to Grice's cooperative principle and not just another factor to be added to it. Leech proposes that the politeness principle and the cooperative principle function differently in different cultures, social classes, and social situations (Leech, 1983). According to the cooperative principle, participants in a conversation communicate with each other based on the assumption that they are being cooperative. Whereas, according to the politeness principle, politeness "has a higher regulative role than this: to maintain the social equilibrium and the friendly relations, which enables us to assume that our interlocutors are being cooperative in the first place" (Leech, 1983, p. 82).

According to Leech (1983), politeness sustains a pleasant relationship and social balance with conversational participants, assuming they all cooperate in a given conversation. It relates not only the content of conversations but also to the ways in which the conversational participants manage and structure their conversation. For example,

interrupting others when they are talking or staying silent when they ask you to talk are impolite actions related to a participant's ways of managing the conversation (Leech, 1983). Politeness (or "absolute politeness"), in Leech's (1983) theoretical approach, can be negative or positive depending on the illocutionary functions of utterances. Negative politeness refers to "minimizing the impoliteness of impolite illocutions", such as in orders; whereas positive politeness refers to "maximizing the politeness of polite illocutions", such as in offers (Leech, 1983, p. 83–84). Leech presents six maxims for politeness, with different degrees of importance, which involve minimizing or maximizing the function of an utterance for the "self" (i.e., the speaker) and/or the other (i.e., the listener or a third party who may or may not exist in the speech situation):

1. **Tact maxim**: a) minimizing the cost to the other; b) maximizing the benefit to the other
2. **Generosity maxim**: a) minimizing the benefit to the self; b) maximizing the cost to the self
3. **Approbation maxim**: a) minimizing the dispraise of the other; b) maximizing the praise of the other
4. **Modesty maxim**: minimizing the praise of the self; b) maximizing the dispraise of the self
5. **Agreement maxim**: a) minimizing disagreement between the self and the other; b) maximizing agreement between the self and the other
6. **Sympathy maxim**: a) minimizing antipathy between the self and the other; b) maximizing sympathy between the self and the other
(Adapted from Leech, 1983, p. 132).

Finally, Brown and Levinson's (1987) politeness theory concentrates on conversational interlocutors and what motivates them to use politeness. The underlying motivation of using politeness among language users was not pursued in the earlier politeness theories of Lakoff and Leech, who viewed politeness as part of the pragmatic rules that participants in a conversation are expected to observe during the interaction (Inagaki, 2007). According to Brown and Levinson (1987), principles that govern the use of language in an interaction are not separate from the principles of social relationships among the people who speak the language. Brown and Levinson, therefore, aimed to provide an explanation of both the principle of language use and the principle of social interaction (Inagaki, 2007). They aimed to establish a politeness model that identifies the universal and social principles of politeness, while observing cross-cultural similarities in its use (Brown & Levinson, 1987).

Brown & Levinson's theory built upon the idea of "face", a concept first developed by Goffman (1967), which involves "the public self-image that every member wants to claim for himself" (Brown & Levinson, 1987, p. 61). Face is a person's social and emotional image that they have for themselves and expect others to see (Yule, 1996). Politeness, as such, is a social behaviour that is used to observe one's own face and the face of others. People usually try to preserve each other's face and defend their own face in the event of a threat (Brown & Levinson, 1987). Two types of politeness, negative and positive, originate from this concept of face. Negative politeness refers to a person's need to be independent, respected, and not disrupted by others. Positive politeness is a person's desire to be accepted and to connect with others in a positive relationship as part of the group (Brown & Levinson, 1987; Yule, 1996). Positive and negative politeness in Brown and Levinson's theory relate to the idea of negative and positive face and must not be confused with positive and negative politeness in Leech's politeness principle, which relate to the illocutionary functions of utterances.

2.2.6.4 Relevance theory

Relevance theory, initially established by Sperber and Wilson (1986; 1995), is an inferential approach to pragmatics; it aims to explain how the listener infers the intended meaning of the speaker by relying on the evidence provided in the conversational context (Wilson & Sperber, 2004). The main claim of relevance theory is that utterances raise expectations of relevance, and these expectations are predictable and accurate enough to direct the listener to infer the intended meaning of the speaker (Wilson & Sperber, 2004). Relevance theory is an attempt to explain Grice's (1989) claim that the expression and recognition of intentions are an essential characteristic of most verbal and non-verbal human communication (Wilson & Sperber, 2004). The theory is also inspired by Grice's foundation of an inferential model of communication as opposed to a code model of communication and his distinction between decoding and inferences (Sperber & Wilson 1995; Wilson & Sperber, 2004).

According to the code model, communication is a process of encoding and decoding messages; the intended message is encoded by a speaker into signals, which are then decoded by the listener using the same copy of the code. In the inferential model, the speaker conveys a specific meaning by providing evidence of their intention; and the listener, in turn, infers these intentions based on the evidence presented. According to Sperber and Wilson (1995),

successful communication can be achieved by inferring and recognising the speaker's meaning, and not only the linguistic meaning of an utterance. Although the decoded linguistic meaning of utterances is important, it is only one part of the communication process and one possible interpretation of the speaker's intended meaning (Wilson & Sperber, 2004).

Relevance theory addresses and clarifies the ambiguities and weaknesses of Grice's important account of communication and his attempt to create a common-sense view of communication (Sperber & Wilson, 1995). For example, the relevance maxim, an important maxim in Grice's cooperative principle, was not entirely explained nor identified. Additionally, the role of the communication context and its importance in communicating and understanding the meaning of an utterance did not receive sufficient attention in Grice's model. In relevance theory, the communication context is of major concern, as it plays an important role in choosing the intended meaning of an utterance from a large number of available assumptions at the time of the utterance.

Sperber and Wilson (1995), stress that recognizing the meaning of an utterance involves more than linguistic decoding; it entails a set of identifications about what is said, what is implied, and contextual implications and information. People tend to use relevant linguistic information and physical contextual information as well as their own knowledge of the world to interpret different utterances in specific situations (Loukusa et al., 2007). When trying to understand the meaning of an utterance, using relevant contextual information makes the comprehension process easier and requires less effort. The human cognitive system automatically observes and uses information that is relevant, instead of processing all available information in a communication context (Loukusa et al., 2007). Searching for relevance is an essential feature of human cognition, and it is the reason that different utterances raise the expectation of relevance, and not communication conventions or principles, such as Grice's cooperative principle (Wilson & Sperber, 2004; Loukusa et al., 2007).

An utterance has several possible interpretations related to its linguistic information, but not all interpretations are equally accessible in a particular context (Loukusa et al., 2007). Input is more relevant to individuals when it is associated with available background information, which helps them reach conclusions that matter to them. So, a particular input is chosen from the mass of available alternatives at one time, not only because it is relevant, but because it is the most relevant and worthy to process (Sperber & Wilson, 1995). This is

achieved by, for example, developing knowledge of a particular topic, answering questions that require answers, or correcting false impressions (Wilson & Sperber, 2004).

The relevance of input to an individual, be it a sight, sound, or utterance, is a matter of degree and is linked to cognitive effect and processing effort. According to Sperber and Wilson (1995), the input will be more relevant to an individual, among other alternatives in a context, if processing it will produce "positive cognitive effects" (Wilson & Sperber, 2004, p. 251). Positive cognitive effects help attain goals and make a meaningful and worthy difference to the representation of the world for the individual. The greater the positive cognitive effect with the least processing effort, the greater the relevance of an utterance to an individual (Wilson & Sperber, 2004; Loukusa et al., 2007). To clarify the idea of positive effect, Wilson and Sperber (2004) provide the following example: A train that arrives after a delay of one minute would not trigger the same cognitive effect as a train that is delayed for half an hour, because it will not make a significant difference to a person's representation of the world, like reorganizing one's day.

In conclusion, different pragmatic theories have been employed as theoretical frameworks in the study of the pragmatic problems of individuals with atypical development such as ASD. For example, Loukusa et al., (2007) used relevance theory to explain the pragmatic comprehension of children with autism and found that these children have difficulties in using relevant contextual information and providing information relevant to the communication context. Surian et al. (1996) used Grice's maxims to test the ability of children with autism to detect pragmatic errors. They found that most children with autism were unable to detect violations of Grice's maxims. The use of these theories as a theoretical framework in research is useful for guiding empirical investigations. The framework provides explanations that help researchers to build specific predictions based on the interpretation of different utterances, to designate typical and atypical pragmatic behaviours (Cummings, 2017).

2.2.7 Pragmatic development

Having introduced key pragmatic theories that extend the understanding of different pragmatic skills, it is essential reviewing pragmatic language acquisition in typical development. Pragmatics, like any skill, is acquired by children as they grow up and begin to learn more advanced linguistic skills. Pragmatic language skills appear gradually among

typically developing children from childhood to adulthood (Peccei, 2006; Owens, 2015). Knowledge of pragmatics develops throughout one's life, from the primary school years to adulthood, until an individual can be said to have developed communicative competence in a wide and diverse range of speech situations (Hymes, 1972; Owens, 2015).

2.2.7.1 Pragmatic development in children

Children gradually acquire the ability to use and link different contextual aspects for the purpose of communication. Essential aspects of pragmatic skills are acquired by children from the preverbal stage such as the most basic speech act which is illustrated in the ability to request by pointing to an object (Airenti, 2017). They are also able to seek the attention of others vocally, physically, and possibly with gestures (Tolchinsky, 2004). Turn-taking ability also develops early in children and is related to their joint attention ability which emerges around the age of six months. However, turn-taking ability needs more time to master and it keeps progress with age until school years (Airenti, 2017). By the age of 2–2.5 years, children are able to use gestures with words to get their needs met and to use verbal and non-verbal means to make different demands, such as asking questions (Stephens & Matthews, 2014). They have also developed the ability to use simple phrases for different purposes; for example, attracting attention by using a question, such as "What's that?" They can use single words, such as "move", "mine" or "ouch", to express commands, possession, or problems (James & Seebach, 1982; Stephens & Matthews, 2014). Additionally, around this age, a fundamental pragmatic conversation ability emerges in children – they begin to use self-repair. As they grow and acquire new skills this ability becomes more sophisticated (Airenti, 2017).

By the age of 3–3.5 years, children are able to talk about events, imagine stories, and use different registers (Patterson & Westby, 1994). They can also engage in longer conversations and assume other roles in play. Other developments around this time include using a different register when talking to younger children, asking for permission, and using language for joking and hypothesising (Klecan-Aker & Swank, 1988). Finally, by the age of 5 years, children have mastered most of the basic pragmatic skills required to socialise and develop throughout their remaining pre-adolescent years. A child of 5 years becomes more able to change their tone of voice to suit listeners' needs and to rely more on verbal devices than physical ones to express themselves. Children of this age can also begin to use indirect requests, an important skill further developed in adolescence. Children also learn to control

aspects of conversations, such as the needs of other participants with respect to turn-taking; planning communication content and adhering to social rules of conversation (Downes, 1998; Airenti, 2017).

In general, a particularly important factor affecting pragmatic development in children after the age of 3 years is their ability to extract meaningful social, physical, or other similar cues from their immediate environment. According to Zufferey (2015), children make good use of social cues to develop their pragmatic skills and achieve their goals in spoken communication, such as learning new word meanings in context. This process works side by side with other facets of language acquisition (Zufferey, 2015) and becomes more sophisticated with increasing age. In other words, pragmatics and other domains of the learners' language faculty help each other so that learning and skills are enhanced (Peccei, 2006).

2.2.7.2 Pragmatic development in adolescents

While adolescents have just completed the acquisition process "proper", they will continue to acquire further pragmatic skills as they go through life, and change their pragmatic "style" as they become older (Cekaite, 2013). Adolescents have different pragmatic conventions than children and need more advanced pragmatic skills as a result of the increased social demands that they are exposed to, in terms of developing reciprocal relationships with peers and communicating effectively in different contexts. For example, in high school, adolescents face more language requirements and require more advanced pragmatic skills than when they were younger and attended primary school. At this stage, their interest in forming relationships and friendships increases as a result of several factors, including social and psychological changes, puberty and the tendency towards independence (Heath, 1982; Vermande et al., 2018).

In adolescence, pragmatic skills play an important role not only in social situations, but also in academic contexts and other contextually-bound environments and situations. Positive social interactions with adolescents' peers facilitate behaviours, such as developing and maintaining interpersonal relationships. In addition, pragmatics also plays a role in academic attainment and help in understanding different social cues (Weiner, 2004). Hyter et al. (2015) studied the pragmatic markers of African American adolescents and found that

pragmatic language skills help adolescents to see the world from the perspective of others and regulate social communication.

Pragmatic problems have negative effects on adolescents' emotional and social lives (Conti-Ramsden et al., 2019). Adolescents with pragmatic problems have difficulty establishing and maintaining friendships. Moreover, it is common for these individuals to have behavioural problems, such as internalising behaviours, and increased levels of stress and depression (Cohen, 1986; Smit et al., 2019). Overall, adolescents with pragmatic problems lack social behaviours that positively affect social relationships with their peers, such as cooperating and sharing (Vaughn et al., 1990). The reason for this may be their difficulties in understanding and interpreting social cues.

The majority of studies on pragmatics and adolescents focus on adolescents with disorders or impairments that negatively impact their pragmatic skills. Deficits in pragmatic language competencies have been linked to child and adolescent disorders, including Autism Spectrum Disorder (ASD), Down syndrome (DS), and Attention Deficit Hyperactivity Disorder (Rice et al., 2005; Volden & Phillips, 2010; Loukusa, 2017; Volden, 2017). Nevertheless, pragmatic deficit is more common in ASD and it is widely reported that most individuals with autism have pragmatic impairment (Landa, 2000; Norbury & Bishop, 2002; Tager-Flusberg et al., 2005; Volden, 2017). Therefore, next section presents more information about ASD as a developmental disorder, its definitions, diagnostic features, aetiology, and prevalence.

2.3 Autism Spectrum Disorder (ASD)

2.3.1 Background

The word *autism* is formed from two Greek words, "autos" (i.e., self) and "ism" (i.e., state); it was first used by a psychiatrist, Eugen Bleuler, in 1911 to describe schizophrenia (Evans, 2013). Child psychiatrist Leo Kanner, a pioneer in the field of autism, was the first to provide a description of the basic characteristics of autism based on a study of a group of 11 children with disordered behaviour (Kanner, 1943). He named this condition as "early infantile autism" and described it as an innate, developmental deficit that prevents the affected person from creating or developing successful communication with others (Baron-Cohen, 2015). According to Kanner, individuals with autism suffer from an inability to

establish social relations and to connect emotionally with other people; and they tend to have obsessions with certain objects and with maintaining routines with resistance to change (Kanner, 1943).

Another pioneer in the field of autism is the paediatrician Hans Asperger. In 1944, one year after Kanner's study, Asperger conducted a study on four children and found almost the same traits as Kanner did. Asperger named the condition "autistic psychopathy", which is now known as Asperger's Syndrome. Both Kanner and Asperger differentiate autism from schizophrenia and found issues, such as deficits in social interaction, restricted interest and behaviour, and resistance to change in their study participants. However, in Asperger's study, the children had higher intellectual abilities and better language skills, and their symptoms did not appear in early infancy (Achkova & Manolova, 2014).

Throughout the 20th century, research into definitions of autism and diagnostic criteria for children has been extensive, leading to various international recommendations. According to the World Health Organization (WHO, 2017), ASD comprises a range of disorders characterised by problems with social behaviour, language, and communication as well as limited activities and interests that are often repetitive and restricted. Hill and Frith (2003) and Volkmar and Klin (2005) define autism as a developmental disorder characterized by communication and cognitive difficulties, together with the emergence of repetitive behaviours. Wing and Gould (1979) describe autism as a "triad of impairment", a deficit in communication ability, an impairment in social relations, and a lack of social imagination. De Villiers et al. (2007a, p. 293) define ASD as "a neurodevelopmental disorder with a biological basis".

In practice, it is difficult to define, diagnose, and classify ASD because its symptoms vary from one individual to another, and not all cases demonstrate the same symptoms (Dodd, 2005). Moreover, the symptoms and their severity may vary, from one age to another, in the same person. Some individuals with autism may suffer from severe cognitive disabilities, while others could have normal or higher than normal IQs. The idea of autism as a range of disorders forming a continuum and not a differentiated disorder was first introduced by Wing (1988). This idea was developed in order to include all individuals with ASD according to the severity of their symptoms as well as their cognitive abilities (Dodd, 2005; Volkmar & Klin, 2005; APA, 2013).

2.3.2 Diagnosis and core features

Most children with autism are diagnosed with the disorder at the age of 3 years or older; nonetheless, some symptoms appear before the actual diagnosis, at about the age of 1 or 2 years (Rogers, 2000). However, some factors, such as the individuals' environment, developmental level, chronological age, and degree of autism severity, affect the extent of symptom clarity and manifestations and thus the age of diagnosis (APA, 2013). In some cases, autism symptoms are apparent from birth and concerns regarding these symptoms are often reported by parents (Tager-Flusberg et al., 2005; Tonge & Brereton, 2011). Some examples of these very early symptoms among children with autism include, lack of response to their mothers' voice or to people speaking around them and weakness in responding to their own names (Tager-Flusberg et al., 2005). Some of these children also experience issues with their language and social skills, reduced eye contact, and difficulty paying visual attention to social cues (Tonge & Brereton, 2011).

Wing (1988) expanded the term "autism" to "autistic spectrum" to include cases of autism with varying onset and characteristics and a range in the severity of the symptoms. Several types of disorders, including childhood autism, Asperger's disorder, high-functioning autism, atypical autism, and pervasive developmental disorder-not otherwise specified (PDD-NOS) were encompassed in the single category of autism spectrum disorder, ASD (APA, 2013). ASD includes all such disorders from mild, moderate, to severe degrees. The proper diagnosis of individuals and their place within the spectrum are determined based on the skills affected and the individual's intellectual and linguistics abilities (Lotspeich et al., 2004).

According to last version of The Diagnostic and Statistical Manual of Mental Disorders-5th Edition (DSM-5; APA, 2013), which is the most recognisable and authoritative guide to the diagnosis of different disorders, the main diagnostic criteria of ASD are deficits in social communication and social interaction; and preference for restricted and repetitive behaviour. ASD's symptoms appear in early childhood and cause difficulty and the need for assistance in daily life (APA, 2013).

2.3.2.1 Impairment in social communication and social interaction

Impairment in social communication and social interaction is a prevalent and persistent feature among people with ASD. This deficit appears in verbal and non-verbal

social communication in varying degrees and manifestations, based on several factors related to the affected individual, such as age, cognitive ability, language ability, history of treatment, and current intervention and support (APA, 2013). Individuals with ASD experience deficits in different areas of social communication and interaction, including social reciprocity; conversational abilities, such as initiating, sustaining, or terminating a conversation; requesting assistance and clarification; understanding non-verbal behaviour and developing relationships (Dodd, 2005; APA, 2013).

Communication deficits and language problems are among the first and most common symptoms of autism (Dodd, 2005). Despite the prominence of language impairment in many people with ASD, there is controversy regarding its significance as a diagnostic factor (Mody & Belliveau, 2013). This controversy might result from the fact that language problems among individuals with ASD don't come in a uniform representation but come in varying degrees, ranging from a complete absence of speech to a delay in language acquisition to typical language functioning (Mody & Belliveau, 2013; Tager-Flusberg, 2016).

In fact, a complete language impairment or a delay in language development of different language abilities is not universal among all individuals with ASD, but there is a tremendous variation in their linguistic profiles (Tager-Flusberg et al., 2005; Tager-Flusberg, 2016; Lim, 2018). For example, lexical and syntactic skills in children with autism are considered to be relatively strong despite a delay in the acquisition and development of these skills. Some individuals with ASD who also have an IQ within the normal range are reported to have normal language skills (e.g., vocabulary, articulation, and grammar) (Tager-Flusberg et al., 2005; Paul et al., 2009). However, even with the presence of intact formal language skills in individuals with ASD, using language for social purposes (pragmatic language) is often found to be impaired in individuals with ASD (Landa, 2000; Norbury & Bishop, 2002; Tager-Flusberg et al., 2005; APA, 2013).

As a result of these variations in the linguistic profiles of different individuals within the autism spectrum, the final version of DSM-5 uses a *specifier* that is "with or without accompanying language impairment" (APA, 2013, p. 51) which comes along with and is added to the main ASD diagnosis criteria to express the level of language functioning. With this specifier, an assessment and description of the current level of verbal performance should be recorded as well. For example, if an accompanying language impairment exists, a further description such as "no intelligible speech" or "phrase speech" can be added. If there is no

accompanying language impairment, the description of the language functioning level can be expressed by adding phrases such as "has fluent speech" or "speaks in full sentences" (APA, 2013). Also, as a result of linguistic skill heterogeneity in ASD, different subgroups of individuals with ASD based on their language functioning (e.g. autism with normal language and autism with impaired language) are used as classifications in many studies of populations with ASD (Kjelgaard & Tager-Flusberg, 2001; Paul et al., 2009; Modyanova et al., 2017).

Differences in language development between children with ASD and typically developing children can be observed in a number of specific behaviours that indicate language deficits among individuals with ASD, including using language mostly to fulfil specific needs, such as getting food or a specific object and rarely using language for social communication; delay or lack of spontaneous functional talk; improper use of formal speech; and lack of discourse coherence (De Villiers et al., 2007a). Children with ASD also have problems using non-verbal gestures to compensate for speech limitations and demonstrate reduced facial expressions and eye contact (Loveland et al., 1988; Capps et al., 1998; De Villiers et al., 2007a).

People with ASD also have difficulties establishing reciprocal social-emotional relationships with their peers and sharing their interests, feelings or activities with others. They have difficulties in initiating social interaction, imitating the behaviours of others, and using language to engage with others in conversations (APA, 2013). Sometimes they react in unusual ways towards others' feelings of anger or affection (National Institute of Mental Health, NIH, 2018). They also have a deficit in developing and maintaining different social relationships, such as friendship. This deficit appears in young children with autism in the form of difficulty in joining activities that require social skills, such as pretending and imaginative play. In adolescents and adults with ASD, the deficit is evident in their difficulty in choosing the appropriate behaviour or register for specific social situations, such as being informal in a formal situation like a job interview (APA, 2013).

Social impairment in individuals with autism might come in the form of preference for withdrawal from others, treating others as objects, or lacking attention and emotions towards others and their feelings (Goldstein & Ozonoff, 2018). Individuals with autism also tend to not use language for social communication (e.g. shares feelings, joins conversations), not follow cultural rules, and lack social awareness overall. Some adults with ASD who have intact cognitive and linguistic abilities sometimes develop strategies that are used as

compensation when facing some challenges they might encounter during social interaction. However, in more complicated and novel contexts that require attention to different social cues, it is difficult for individuals with ASD to apply these strategies, and their impairment in social-emotional reciprocity becomes more obvious (APA, 2013).

Furthermore, according to the APA (2013), people with ASD suffer from deficits in understanding facial expressions, gazes, gestures and body language in socialising with other people. This social impairment in non-verbal communicative behaviours may be caused by poor awareness of social cues (Dodd, 2005). People with ASD were reported to have an impairment in the area of joint attention that appeared in early infancy (APA, 2013). Joint attention is the ability to share attention with a partner in social interaction to a particular object or event (Landa, 2005). Impairment in this non-verbal social behaviour (joint attention) might be an early sign that can predict ASD (Baron-Cohen, 1989; Gillespie-Lynch et al., 2013). This deficit can manifest in the inability to point to an object, look at others, share toys, share interest with others in a moment of joint attention, or follow others' pointing or eye gaze. The integration of non-verbal communication, such as body language, with speech in some adults with ASD who can speak fluently may seem strange or exaggerated in some situations (APA, 2013).

2.3.2.2 Restricted interests and repetitive behaviour

Individuals with autism are abnormally obsessed with particular interests, objects, routines, and repetitive movements. Repetition can appear in motions, such as flapping hands; in speech, such as echolalia (i.e., repetition of immediate or delayed speech); or in the use of objects, such as lining up cars (APA, 2013). Individuals with autism may also obsessively focus on the way a certain object moves or show an extreme interest in specific topics, such as numbers or facts. Their restricted pattern of behaviour is evident by their resistance to change and holding on to routine, and any change may upset them and, for some, result in aggressive behaviour (NIH, 2018). Finally, for individuals with ASD, restricted interest can manifest in their abnormal focusing on things such as a vacuum cleaner or spending long hours writing timetables (APA, 2013). However, these behaviours and traits appear in people with ASD in different forms based on age, intervention, and support (APA, 2013). For example, in children, the impairment appears in the way they play or fail to play, lack of imaginative play, absence of team play with other children, and interest in repeating a specific game over and over. For adults, it appears in the form of abnormal interest in a

particular topic and repeating it without caring or noticing if other people are interested in it or not.

2.3.2.3 Other impairments associated with ASD

Sensitivity to light, noise, and textures and sleep problems are reported in many studies as common issues in people with ASD (e.g., Wilbarger & Wilbarger, 1991; Fouse & Wheeler, 1997; Ozonoff et al., 2003; Levy et al., 2007). Many people with autism have a very sensitive sense of hearing; they hear certain sound frequencies intensely, which makes them very uncomfortable and causes pain, and may cause aggression or violent reactions (Berard 1993, Rimland & Edelson 1994). Negative behaviours, such as rage and violence, which some individuals with ASD show, may be defensive strategies and reactions to their sensitivity to things, such as light, noise, and textures (Grandin, 1995; Fouse & Wheeler, 1997).

Sleep problems are also commonly found in people with ASD. Richdale and Prior (1995) found that school-aged children with ASD, according to their parents' report, have more sleep problems than typically developing children of the same age (44% compared to 27%). Examples of these sleep problems are short night sleep, frequent waking during the night, and early wake up in the morning despite not going to sleep early (Richdale & Prior, 1995). Possible causes for these sleep problems have been reported in the literature. According to Richdale and Prior (1995) social deficit, a core feature of ASD, may lead to sleep problems because of difficulties individuals with ASD have in observing and using social cues to synchronise and organise their sleep/wake cycle. Medical reasons have also been identified as causes, including, medical conditions, such as seizures, breathing problems, digestion problems; and side effects of prescribed medications (Krakowiak et al., 2008).

2.3.2.4 Special abilities associated with ASD

Although, individuals with ASD have a lot of problems, it is common for them to have some special abilities and talents as well; for example, in drawing, music, art, and math (Happé, 2018). Some individuals with ASD also have above-average IQs, a strong memory, and the ability to learn things in detail and to master subjects, such as mathematics and science (Centres for Disease Control and Prevention, CDC, 2018). According to Happé and Vital (2009), some special skills and talents are found more often in people with autism than

in any other group with developmental or intellectual disorders. Approximately one in 10 people with autism is savant, based on reports from parents and caregivers (Rimland, 1978, as cited in Happé & Vital, 2009). Meilleur et al. (2015), in their study of special skills and talents in individuals with autism, found that 62.5 % of their participants (N= 254) had special skills and talents.

A possible cause for the presence of special skills in individuals with autism may be due to traits associated with ASD, such as restricted and repetitive interests and behaviours and a detail-focused cognitive style (Happé & Vital, 2009; Happé 2018). Children with ASD tend to notice and remember details rather than focus on a holistic view of things. This cognitive style is called "weak central coherence", a cognitive deficit commonly found in people with ASD causing them to pay more attention to details and process local and not global information (Happé, 2018).

2.3.3 Aetiology

The causes of autism disorder continue to be explored; and, to date, no definite cause has been identified. Based on the diverse behaviour patterns of individuals with ASD, it seems that there is no single cause for this disorder; and, instead, there are multiple causes (CDC, 2018; National Autistic Society, NAS, 2019). Over the years, there has been a lot of controversy regarding the causes of autism. In the past, some believed that autism was caused by bad parenting, maternal coldness, or lack of affection. Kanner (1949) suggested that a "genuine lack of maternal warmth" causes autism. In 1967, Bettelheim proposed the theory of "refrigerator mothers", with no scientific evidence to support it. Vaccines were also considered a catalyst of autism. This hypothesis was first proposed by Wakefield et al. (1998), who claimed that the measles, mumps, and rubella (MMR) vaccines may cause autism. Wakefield et al., in their 1998 *Lancet* paper, reported that eight out of 12 children with autism who participated in their study experienced the appearance of autism symptoms 1 month after receiving the MMR vaccine. Despite its small sample, insufficient data, questionable results, and ethical violations, many parents throughout the world were affected by the Wakefield study findings and avoided vaccinating their children because they were worried their children would develop autism. As a result, vaccination rates decreased in both the United Kingdom and the United States and around the world (Rao & Andrade, 2011). Wakefield et al.'s results were never replicated and a large body of evidence and extensive research failed to find a causal relationship between MMR and autism (Taylor et al., 2002;

Honda et al., 2005). In 2010, Wakefield et al.'s (1998) paper was fully retracted by *The Lancet*. However, this study continues to have significant impact on the public, and some still believe vaccines may cause autism in children (Kasik, 2012).

Although there is no evidence of the exact causes of autism, recent studies have reported genetic, biological, and environmental factors as possible causes that may increase the likelihood of ASD among children. Different contributions of these factors may explain the heterogeneity of symptoms found in people with autism (WHO, 2017).

Some types of autism are associated with genetic factors (Huguet & Bourgeron, 2013). Scientists have been trying to identify the specific genes responsible for its emergence for many years, as multiple genes are involved in autism development (Freitag, 2007; NAS, 2019). Specific genetic or chromosomal conditions, such as fragile X syndrome, heighten the risk of ASD. Twins or siblings of a child with ASD are more likely to have ASD as well. Studies of genetic heritability in twins found a high occurrence rate of autism among twins and the genes responsible for 60%–90 % of twins with ASD (Bailey et al., 1995; Freitag, 2007). The genetic heritability of autism is also supported by the increased prevalence of autism among infants who have siblings with ASD (Ozonoff et al. 2011). Studies have also found that different genetic factors are responsible for different autism symptoms; identifying the specific genes responsible for each symptom will help study these symptoms in more detail (Ronald et al., 2006). However, genetic factors may account for some cases of autism but not all, as genes are responsible for only about 1%–2% of cases, and other factors contribute to the occurrence of autism (Abrahams & Geschwind, 2008).

Biological factors have also been reported as possible causes of autism and may underlie some of the behaviours of children with ASD (Volker & Lopata, 2008; Strathearn, 2009; Lord et al., 2018). Biological factors may be associated with brain development, as abnormalities in the structure of the brain are found in individuals with ASD (Tager-Flusberg, 2016). The brains of children with autism undergo an abnormal growth pattern immediately after birth compared to the brains of typically developing children (Lord et al., 2018). Overgrowth in brain volume among children with autism begins to subside before the age of two (Volker & Lopata, 2008). However, rapid growth in the brain of infants with ASD may change and alter connectivity and collaboration between different brain areas (Just et al., 2004; Lord et al., 2018). Just et al. (2004, p. 1812) found that the functional connectivity (i.e., "the correlation between the activation time series data of two brain areas") of individuals

with ASD, between brain areas involved in sentence comprehension, was lower compared to TD individuals. Abnormal neural connectivity between brain areas has been considered the cause of deficits in some people with autism, and not deficits in particular brain regions (Wickelgren, 2005). Poor connection in the brain regions of individuals with autism may make it difficult for them to shift quickly from one brain state to another (King et al., 2018).

Finally, environmental factors have been studied as potential causes of autism. Some environmental factors are related to the pregnancy period, including a mother's exposure to toxins, use of certain drugs during pregnancy, or contracting infections or fever. All of these factors may increase the risk of autism in the children born (Gardener et al., 2009; Zerbo et al., 2013). Parental age and having children at an older age as well as birth complications and conditions, such as light weight at birth or premature birth, are also possible environmental causes for autism (CDC, 2018).

2.3.4 Prevalence

Autism occurs among people of different ages, races, ethnic groups, and social levels. It is more prevalent in males than in females, with a ratio of about four males to one female (CDC, 2018). The number of people diagnosed with autism has increased significantly around the world (Onaolapo & Onaolapo, 2017). According to Tincani et al., "autism is one of the fastest growing disability categories in the United States" (2006, p. 177). This increase can be attributed to continuous change in the diagnostic criteria, improvements in measuring and screening tools and in their validity and reliability, as well as increased public awareness about autism (Bishop et al., 2008; Matson & Kozlowski, 2011).

In 2017, the WHO reported that an estimated 1 in every 160 children has ASD. According to the NAS (2018), about 700,000 people in the United Kingdom have ASD, or more than 1 in 100 people. In the United States, ASD affects about 1 in 68 children (CDS, 2017). According to the Saudi General Authority for Statistics (2017), in Saudi Arabia (the study context), with a total population of approximately 32 million, 53,282 individuals have autism. However, a number of studies (e.g., Al-Jarallah et al., 2006; Al-Salehi et al., 2009) have reported different data about the number of people with ASD in Saudi Arabia, and many children with ASD may remain unidentified. As such, there are no confirmed data about the prevalence of autism in Saudi Arabia (Alnemary et al., 2017a). At the same time, available information indicates that there is an increase in the number of people diagnosed with ASD in

Saudi Arabia as in the rest of the world (Zeina et al., 2014). A review of the status of ASD in the Saudi Arabian context, information about support provided to individuals with ASD in Saudi Arabia, and the issues they face are discussed in detail in section 2.5.

In summary of the previous two sections, many topics related to both pragmatics as a branch of linguistics and ASD as a developmental disorder have been introduced and reviewed in order to provide an overview of each of them. The link between these two areas is that presences of pragmatic deficit as a central impairment, or a defining feature of ASD that is found in most individuals with ASD (Landa, 2000; Tager-Flusberg et al., 2005; APA, 2013). Thus, in the next section, pragmatic deficit in individuals with ASD and different topics related to it are discussed in more detail.

2.4 Pragmatic Deficits in Individuals with ASD

2.4.1 Background

Autism has a great impact on children's growth, learning, and cognitive processes, including understanding and expressing language (Ozonoff & Miller, 1996). Developmental language research suggests that individuals with ASD are extremely heterogeneous in their phonological, morphosyntactic, and lexical abilities; whereas, most of this population has deficits in their pragmatic competence (Landa, 2000; Norbury & Bishop, 2002; Tager-Flusberg et al., 2005; Tager-Flusberg, 2015). Language impairment is no longer a core feature of ASD; many children with ASD can learn and use some language although their language use might vary from average to below average competency or emergence may be delayed when compared with typically developing children (ASHA, 2013; Yamashiro & Vouloumanos, 2019). Thus, pragmatic deficits do not necessarily have to be accompanied by deficits in other language skills and they can exist in the presence of intact formal language skills (Yamashiro & Vouloumanos, 2019). Impairment in all or some of the pragmatic skills appears in most cases within the autism spectrum, across ages and various language and cognitive abilities (Tager-Flusberg, 2000). Even in cases where their other linguistics abilities are advanced, the pragmatic language skills of individuals with autism are repetitive, formulaic, and significantly weaker than the skills of individuals without autism (Baltaxe, 1977).

Interaction between linguistic, social, and cognitive competence leads to pragmatic competence, and a deficit in any of these competences may lead to impairment in the social use of the language (i.e., pragmatics; Baltaxe, 1977). Pragmatic language impairment is the inappropriate use of language in a social context, inability to adapt language based on the listeners' needs and contextual demands as well as difficulty in understanding implied meanings and following social rules for conversations (Volden & Lord, 1991; Ketelaars & Embrechts, 2017). Eales (1993) investigated a number of factors linked to pragmatic impairment among a group of people with autism. He concluded that pragmatic difficulties in individuals with autism originate from their difficulties in forming contextually-appropriate communicative intentions and from their inability to execute and express these intentions in appropriate utterances.

Pragmatic deficits are not only errors in language decoding, processing, and production; they also hinder social relations in people with ASD and negatively, often severely, affect their social interactions and cause serious behavioural problems (Ziatas et al., 2003; Conti-Ramsden et al., 2019). Language is a fundamental part of sustaining social interaction and interpreting the emotional content of communication, which in turn is essential for understanding the relationships between people (Yule, 1996). Pragmatic deficits also prevent individuals with ASD from forming friendships, especially among individuals with high-functioning autism (HFA) because individuals with HFA are more aware of their difficulties than individuals with ASD who have lower cognitive abilities (Murza & Nye, 2013). Individuals with HFA also use language in a way that often appears to be structured as normal language and acquire some language skills (Kasher & Meilijson, 1996). As a result, people interacting with individuals with HFA may, at times, overestimate their language capabilities and often have unrealistic views and expectations of their level of understanding and communication and social skills (Landa, 2000; Young et al., 2005).

2.4.2 Common pragmatic language difficulties in individuals with ASD

Various difficulties in pragmatic abilities, such as non-literal language, narrative abilities, and conversational skills, have been widely reported in individuals with ASD and extensively studied (Loveland et al., 1990; McCormick et al., 2003; De Villiers et al., 2007a; Paul et al., 2009). According to Tager-Flusberg (2000), pragmatic difficulties in autism can be grouped into three main deficit categories, difficulties in understanding intended meaning and interpreting literal meaning instead; inability to use narrative as a tool to communicate different states and events; and deficits in conversational context and taking account of other conversational participants.

Difficulties in understanding and interpreting non-literal language, such as metaphors, similes, and irony, have been reported widely in individuals with ASD (e.g., Happé, 1993; McCormick et al. 2003; Paul et al., 2009). Non-literal language requires that individuals infer the meaning behind the literal words. This ability is found in normal development between the ages of four and six years and it is an important ability to successfully communicate with others (Dennis et al., 2001; Adams, 2002). However, individuals with ASD tend to focus on the literal meanings of an utterance and fail to consider symbolic meanings or contextual factors that are relevant to the meaning of an utterance in a particular situation (Tager-Flusberg et al., 2005). According to Mitchell et al., (1997), children with autism fail to infer

the intended meaning of speakers in a conversational context and instead understand the literal meaning of words. Processing metaphors, irony, or any other form of non-literal language imposes a bigger challenge on people with ASD, as figurative language is a demanding inferential process (Dennis et al., 2001).

Pragmatic difficulties in non-conversational contexts, such as storytelling and narrative are also a common problem for individuals with autism (Loveland & Tunali, 1993). This ability of producing narrative is usually acquired by typically developing children during their preschool years (Adams, 2002). In contrast, individuals with autism lack the ability to interpret and convey experiences through narrative and have difficulties when trying to enrich their stories with social and psychological significance (Loveland et al., 1990). Losh and Capps (2003) found that individuals with ASD are disinclined to narrate in conversational interactions and tend to produce stories lacking in coherence even when prompted (Diehl et al., 2006). In their study of narrative ability in children and adolescents with autism, Loveland et al. (1990) showed participants a puppet show or a video and then asked them to recount the story. Loveland et al. found that participants with autism tended to commit more linguistic errors, used more bizarre language and expressions, and had difficulty linking story events in a logical and meaningful way.

However, Bottema-Beutel and White (2016) argue that some individuals with ASD in their study reported to favour using a more coherent discourse in the narrative. They tried to use linking devices in their story-telling and the capabilities of building a narrative between TD teenagers and teenagers with ASD were not extremely different. Both groups displayed a diversity of competencies and difficulties. The authors point out that even though participants wished for a more coherent narrative, they did not produce solutions to make their stories more coherent. This may mean there is a difference between linguistic production and linguistic comprehension. While individuals with ASD may be capable of comprehending well, they may not have the same capacity when producing a narrative.

People with ASD also have difficulties in conversational context and the basic aspects of conversation (Tager-Flusberg, 2000; Paul et al., 2009; Volden, 2017). Conversation depends heavily on reciprocity and the understanding of others' mental states and perspectives, which are reported areas of dysfunction and weakness in individuals with ASD (Goldman & DeNigris, 2015). In typical development, children, from their early years, start to use various conversational skills to maintain reciprocity in conversations (e.g., asking

questions); these skills continue to develop and become more complex with increasing age (Koegel et al., 2014). Individuals with ASD are widely reported to have issues with reciprocity and engaging in collaborative social conversations (Tager-Flusberg et al., 2005; Paul et al., 2009; Koegel et al., 2014). Examples of these conversational difficulties include, deficit in understanding the relationship between the roles of speaker and listener, which may be the result of difficulties in understanding the notion self and other (Tager-Flusberg, 2000). Individuals with ASD also have difficulties following conversational rules, differentiating between new and old information and maintaining conversations by adding new and relevant information to the ongoing topic (Baltaxe, 1997; Tager-Flusberg & Anderson, 1991; Tager-Flusberg, 2000). They also have difficulties in understanding that communication is not only about interpreting and understanding the literal meaning of utterances, but also there are intended meanings that need to be inferred and interpreted as well (Happé, 1993; Tager-Flusberg, 2000).

Paul et al. (2009) attempted to detect conversational behaviours and difficulties among a group of individuals with ASD compared to their typically developing peers. They found that pragmatic difficulties in participants with ASD were mainly in three areas, topic management, information management, and reciprocity. *Topic management* refers to the ability to produce coherent discourse and comments relevant to the topic of conversation and of common interest between interlocutors. *Information management* refers to the ability to produce the appropriate amount and type of information for the listener and the situation. Finally, *reciprocity* refers to the capacity to maintain a conversational exchange where breakdowns or misunderstandings can be repaired (Paul et al., 2009). Paul et al. suggested that people with autism, especially individuals with HFA, do have some conversational skills. "Thus, in some sense, these speakers may not need to learn 'how' to converse but may need additional cues as to 'when' their successful conversational behaviours should be applied" (Paul et al., 2009, p.122).

Although individuals with autism have many conversational difficulties, this study focuses on four key pragmatic skills that are required to conduct a successful conversation (See Simmons et al., 2014), and are the most common pragmatic difficulties found in individuals with ASD (See Landa, 2005; Tager-Flusberg et al., 2005; De Villiers et al., 2007b; Paul et al., 2009). These four main areas are discourse management, communicative functions, conversational repair, and presupposition.

2.4.2.1 Discourse management

One of the main pragmatic difficulties people with ASD face is a deficit in their discourse management abilities. Austin (2013) defined discourse management as the ability to organize topics and turns and to repair any communication breakdowns during conversation. Discourse participants need to organise and structure discourse and consider the intentions and needs of other interlocutors. Managing discourse could be viewed as the most challenging and complicated pragmatic ability, since it contains many advanced conversational skills that are necessary for a conversation to be productive (Landa, 2005). Examples of these skills include the ability to take turns, initiate topics, maintain and terminate conversations, maintain proper eye contact, and recognize non-verbal cues.

Difficulties in different skills required for discourse management are common among individuals with ASD. For example, they have problems recognising communicative intentions and contributing new information to new topics. They also have difficulties employing appropriate repair strategies when miscommunication occurs, questioning or answering in an appropriate manner, and understanding what is acceptable in a particular culture or society, which results in problems with politeness (Baltaxe, 1977; Capps et al., 1998; Paul, 2001; McCormick et al., 2003; Tager-Flusberg et al., 2005; Paul et al., 2009; Volden, 2017).

Inability to take turns appropriately or taking turns at the right times are commonly reported in individuals with ASD (Paul et al., 2014). Taking turns in a conversation is a complicated task that requires conversational interlocutors to recognise juncture points in the conversation, which require a change of turn, to ensure the smooth transition from one speaker to the other (Ochs et al., 2004). The ability to take turns begins to appear in the first year of a child's life, in typical development, and is established at the age of 3 years (Adams, 2002). Baltaxe (1977) found that teenagers with autism have problems taking turns in conversations, in the form of difficulties in shifting roles from listener to speaker; they inappropriately maintain their role as listener, leading to permanent confusion between the pronouns "you" and "I" in their conversations. Baron-Cohen (1988) explains that difficulties in turn-taking in individuals with autism may manifest in different forms, such as inappropriate interruptions, the inability to signal turn-taking and offer appropriate cues to take turns, and holding the speaker or respondent role for too long.

In addition, many individuals with autism have issues in initiating and sustaining spontaneous communication, important social tools that enable individuals to be involved in their communities (Tager-Flusberg et al., 2005; Paul et al., 2009; Volden, 2017). Individuals with autism encounter difficulties in staying with the topic of a conversation and contributing new and related information to the topic (Landa, 2000). Capps et al. (1998) also found that children with autism performed poorly in contributing new and related information to the topic during a conversation compared with the other group (children with developmental delays). According to Tager-Flusberg and Anderson (1991), typically developing children and children with Down syndrome can expand on the topic of a conversation, relate new and topic-relevant information, and change their communication content, whereas children with ASD lack these skills.

Individuals with ASD also have difficulties in terminating conversation topics and struggle with how and when to end a conversation. Chuba et al. (2003) found that adolescents with ASD had deficient topic-termination abilities. Landa (2000) attributed the inability to terminate the topic of a conversation to a deficit in the executive-control function of inhibition that occurs in people with autism. This ability is part of an individual's cognitive system, which is an important aspect of development for pragmatic acquisition.

2.4.2.2 Communicative functions

Knowledge of basic speech-act types, such as assertions, questions, requests, and commands, is a part of speakers' knowledge of any language (Kasher, 1991). Typically developing children acquire a large number of these basic speech acts by the age of 3 to 4 years; at the age of 9 years, they master more advanced speech acts, such as persuading (Adams, 2002). However, children with ASD show different patterns of development in terms of communicative functions, which are distinct from the development of typical children (Calloway et al., 1999; Wetherby et al. 2007). Children with ASD have problems acquiring this type of pragmatic knowledge and difficulties in expressing communicative functions with words. They also have issues dealing with basic and more advanced speech acts, such as congratulating, proclaiming, and promising; and they may become extremely echolalic in such cases (Kasher & Meilijson, 1996). Paul et al. (2014) also reported that children with autism use a restricted number of speech acts.

Communicative functions also refer to the goals and intentions of communication. According to Landa (2005), these intentions and goals can be either *declarative* or *regulatory* in nature. Declarative intentions refer to social purposes of communication, while regulatory intentions refer to non-social goals of communication, when communication is used to request things or regulate interactions to achieve a specific purpose or action (Landa, 2000). For people with autism, the use of language for communication is often limited to instrumental functions for behaviour regulation, where they regulate the actions of others to meet their own needs, and not for social purposes (Landa, 2000, Tager-Flusberg, 2000). Individuals with autism develop the ability to use communicative functions to govern behaviour regulation, such as making requests, before other functions, such as commenting (Stone et al., 1997; Wetherby et al., 1989). Wetherby and Prutting (1984) confirm this result in their study, where they found that children with autism request and protest more frequently than other communicative functions. Krantz and McClannahan (1998) add that children with autism use requesting as a way of initiating conversation, but this ability is limited to single word requests for basic needs, such as toys or food.

Difficulties in acquiring the ability to use some communicative functions in individuals with ASD, such as commenting and protesting, may stem from the joint attention these functions demand, an area of deficit in autism (ASHA, 2006; Wetherby et al. 2007). People with ASD tend to have issues with jointly directing attention to someone else or to an object (ASHA, 2006). This deficit is considered one of the earliest symptoms of ASD and contributes to the diagnosis of autism (Woods & Wetherby, 2003). Paul et al. (2009) suggest that this deficit may reflect a failure of attention and sensitivity to others. Neglecting the cues of others may result in a failure to form hypotheses in order to understand and act upon these cues.

People with autism, at times, utilise conventional or unconventional behaviours for communication to maintain simple social contact (Wetherby & Prutting, 1984; Tager-Flusberg, 2000). Loveland et al. (1988) reported that people with autism either lack or have a limited number of communicative functions. Their deficit in communicative functions is evident when they use verbal and non-verbal actions for social-pragmatic functions (Stone et al., 1997). Wetherby and Prutting (1984) analysed the speech acts of children and found that children with autism use some communicative functions, such as protesting and expressing rejection, but they do not acquire these skills until they are older and may require intervention

to do so. However, even if individuals with ASD use some communicative functions, they rarely use these functions to interact socially with others, to offer new information, comment on current or past events, or attract the attention of others (Tager-Flusberg, 2000). Therefore, significant limitations in using different communicative functions are a main characteristic of the language of people with autism (Tager-Flusberg, 2000).

2.4.2.3 Conversational repair

Conversational breakdown and repair is another area of difficulty common among individuals with ASD (Baltaxe, 1977; Paul, 1987; Simmon et al., 2014). In discourse, it is important for speakers and listeners to collaborate to ensure the delivery of meaning. Both speakers and listeners share the responsibility to engage in meaningful social exchange. However, if one of the discourse participants fails to keep the exchange meaningful, a communication breakdown occurs and the need for repair and clarification arises. According to Garvey (1977), a request for clarification is a query from a listener to a speaker, following a conversational breakdown and the need for repair. Such requests are important gestures for speakers and help them determine the nature and source of any breakdown and employ appropriate repair strategies (Garvey, 1977; Volden, 2017).

Brinton et al. (1986) noted that conversational repair strategies are essential for effective communicative interaction. Conversational repair is a complicated task that demands the successful implementation of a set of cognitive, linguistic, and social skills (Volden, 2004). Stirling et al. (2007) suggested that children with autism encounter problems repairing conversational breakdowns and require multiple attempts to succeed. In Greenlee's (1981) study of individuals with ASD repairing communication and responding to clarification requests from a conversational partner, a participant succeeded in repairing only two communication breakdowns out of 27. Similarly, Baltaxe (1977) found that adolescents with autism in her study repaired breakdowns only in few situations. On the other hand, Paul and Cohen (1984), and Geller (1998) found that individuals with ASD do have the ability to notice breakdowns in communication and ask for clarification. Yet, despite their importance, these studies did not use a control group and, as such, the validity of their findings is limited (Volden, 2004).

A number of skills are required to repair communication appropriately (Volden, 2004). People with ASD have difficulties related to these skills resulting in conversation

breakdowns and deficits in repair strategies (Ozonoff et al., 1991; Baron-Cohen, 2000). These skills include, the speakers' ability to attribute other participants' knowledge and mental states, the speaker's ability to recognize the listener's clarification requests and identify which part of their utterances need to be clarified, and finally the speaker's ability to repair and modify their message (Volden, 2004). Difficulties in these different skills can pertain to deficits in two main social and cognitive functions found among individuals with ASD. The first deficit is the inability to recognise the needs, desires, and mental states of others, a deficit in what is called the theory of mind (Baron-Cohen, 2000). The second deficit refers to mental skills, such as planning, organising, and problem solving, known as the executive function deficit (Ozonoff et al., 1991). More information about impairment in the theory of mind and the executive dysfunction is presented in section 2.4.6.

2.4.2.4 Presupposition

Presuppositions is the knowledge and expectations about the needs of conversational partners and thus provide information that is appropriate to the communication context in both quantitative and qualitative ways (Landa, 2000; Young et al., 2005). Lyons (2013, p. 2356) defines presupposition as "an implicit assumption about the background knowledge relating to an utterance whose truth is taken for granted in discourse". This background knowledge is expected to be known by all participants in a conversation. Presupposition competence requires the speaker to consider different aspects of the communication context and other conversational participants, in term of their relationship and background information (Volden, 2017). The speaker needs to estimate the amount of information required, what the listener already knows, and how much remains to be communicated, as well as infer the appropriate type and form of language to be used in the context and topic of the conversation (Landa, 2005; Volden, 2017). Therefore, presupposition is triggered and derived from the linguistic information contained in utterances as well as from the conversational participants' background information.

Presupposition requires mastery of several skills, including awareness of the perspectives of others, and consideration of social rules (Landa, 2000). An example of presupposition is demonstrated in the sentence "The King of France is wise" (El-Gamal, 2001, p. 49). This utterance assumes that there is a country called France and that France has a king; there is no need to mention this in detail because the sentence presupposes this knowledge. Presupposition competence enables the speaker to provide appropriate and

adequate information in a conversation. DeHart and Maratsos (1984), proposed three basic types of presupposition. The first type relates to assumptions regarding the rules governing a conversation and communication; the second type relates to specific linguistic forms, such as definite pronouns and articles, that presuppose their referents; and the third type relates to linguistic devices, such as presupposing information using stress or word order in a sentence.

The concept of presupposition interfaces to some extent with what is called informativeness. Utterances typically contain explicit information (informativeness) along with a number of underlying implicit assumptions (presuppositions). According to Davies and Arnold (2019), informativeness is a property of expression in its context, which includes physical context, intention of speakers and features of discourse. The degree of informativeness of an utterance is related to context and expression changes; a more informative expression limits the possible candidate referents in a given context and corresponds to a smaller set of possible referent options. Informativeness is also a property of speakers. A speaker's use of highly informative expressions that are close to their intended meanings makes it easier for listeners to infer the speakers' meaning from several possible choices in a specific communicative context. Thus, the basic idea behind presupposition and informativeness is providing information that is appropriate to the communication context and to the conversational partner. The two terms (Informativeness and presuppositions) could be regarded as two sides of the same phenomenon. However, throughout this thesis the term "presupposition" is used to refer to this pragmatics phenomenon as guided by most of the literature in this subject area and by the main tools used in this research where the term presupposition is used.

Typically developing children, begin to develop presupposition competence from an early age, and in their preschool years they seem to have some of the basic presupposition skills (DeHart & Maratsos, 1984; Landa, 2005). Whereas, individuals with ASD commonly experience difficulties in their ability to engage in presuppositions (Young et al., 2005). Individuals with ASD lack the linguistic and cognitive abilities required to understand presuppositions. This failure can result from their lack of understanding of verbal and non-verbal cues, and consequently, their inability to produce language in a way that is suited to dynamic context cues (Kanner, 1943). As a result of this deficit, individuals with ASD may fail to share the background details of a conversation or to use the appropriate style for the context (Baltaxe 1977; Landa, 2000).

McCaleb and Prizant (1985) investigated the ability of children with autism to highlight old and new information using contrastive stress in multiple words and phrases and one-word utterances. They examined this ability during an interaction between four children with autism and their language pathologist and teacher. Study findings show that none of their participants were able to highlight old information and instead presented it as new information. This suggests that participants coded old and new information in the same way. Young et al. (2005) similarly found that individuals with ASD have presupposition problems, which may result from an inability to identify the needs of other conversational participants. For example, they may not understand whether it is appropriate to use a pronoun or mention a particular referent. Paul et al. (2014) reported that children with ASD have issues understanding the perspectives of others and judging how much to say. Baltaxe (1977), in her study of pragmatic difficulties in the language of adolescents with autism, found that they do not have the ability to determine the appropriate amount of required information. They also have an impairment in foregrounding and backgrounding information in a given context, as their words choices make it challenging for the listener to distinguish between old and new information.

The presupposition deficit may be linked to the difficulties ASD individuals face in topic and information management skills, which are necessary elements for decoding presuppositions (Ward & Horn, 2004). As presuppositions require the ability to anticipate the knowledge and thoughts of listeners, it also requires knowledge of how listeners think and what they wish to know; this information is necessary when selecting the information to convey in a conversation. However, ASD individuals have issues in predicting both what listeners already know and what they wish to know. Hence, they experience problems selecting information in their discourse.

2.4.3 Factors affecting pragmatic performance in individuals with ASD

Communication is a dynamic and complex process that is highly influenced by the environmental conditions and people involved in the process. Communicative environments and communicative partners are important factors that influence the communication context; and, as pragmatic behaviour is closely related to context, these factors must be considered in pragmatic studies and investigations (Chaban, 1996; Yule, 1996; Volkmar et al., 1997). The communicative environment is the physical context where the communication occurs and

communicative partners refer to other conversational participants. These two factors are important aspects of communication and affect communication abilities and performance (Bradshaw, 1998). Children with ASD are sensitive to these contextual factors during interactions (Keen, 2014). Communicative partners and environments have been widely reported in research on autism as influential elements in the pragmatic skills and communicative performance of individuals with ASD (e.g., Bernard-Opitz, 1982; Tager-Flusberg & Anderson, 1991; Bauminger-Zviely et al., 2017; Jones et al., 2017).

Familiarity with the communicative environment and partners plays a significant role in shaping conversational context and has a positive influence on an individual's communicative abilities (Ervin-Tripp, 2000). According to Tager-Flusberg and Anderson (1991), children with autism show less impairment in some discourse abilities when they interact with their mothers in a familiar environment. Many studies in the field of autism also reported that children respond differently to different caregiver's styles and behaviours (Clark & Seifer, 1985; Raver & Leadbeater, 1995). Conversation partners may also impact the frequency of communicative performance in children with ASD (Keen, 2014). McHale et al. (1980) found that the quality and quantity of communicative performance in children with autism is better in the presence of their teachers compared to situations where their teachers were not present.

Children with ASD may rely on prompts and stimulation from their conversational partners to help them produce some pragmatic behaviours. According to Loveland et al. (1990) despite the various communicative problems of children with autism, they might communicate better when stimulated by people such as their parents. This stimulation may come in the form of verbal cues, instructions, and/or physical guidance (Chiang & Carter, 2008). Communicative partners who often communicate with people with ASD (e.g., parents, teachers, caregivers), and are trained in intervention programmes, have specific skills that help them support communication in this population. For example, they might support children with ASD by accommodating their behaviours to meet the children's needs, using a variety of strategies to stimulate them to interact or take a role in a conversation, identifying and providing different opportunities for communication, and modifying and using the environment to encourage and assist in communication (Charlop et al., 1985; Meadan et al, 2009).

According to Bernard-Opitz (1982), pragmatic behaviour varies according to the communicative partners and settings. In her case study of the pragmatic skills of a child with autism, she found that the child's performance was better when he was with his mother in maintaining the conversation topic and turn-taking compared to his performance with a clinician. Keen (2014) also found that children with autism need more help from their parents in communication compared to typically developing children; and, consequently, their parents use more strategies to support their children's skills. Some parents or caregivers of children with ASD use modified language, including language simplification, shortened sentences, corrections, direct questions and easy vocabulary to increase responsiveness and improve their children's communication abilities (Goldman & DeNigris, 2015; Charlop et al., 1985).

Jones et al. (2017) and Dawson et al. (1990) also examined the influence of communicative contexts and partners in the non-verbal pragmatic behaviour of eye gaze. Jones et al. (2017), in their study of the effects of different types of interactional contexts on eye contact behaviour in children with ASD, found that the amount of eye gaze in participants with ASD varies according to the different environmental demands of the contexts of the interaction. Children with ASD have more eye contact in conversational contexts where there are not any toys presented compared to free-play contexts in the presence of toys, where they have less eye contact, as the presence of toys might cause the children to be distracted, which affects their eye-contact behaviours (Jones et al., 2017). Dawson et al. (1990) also found that children with ASD tend to look more at their mothers' faces (familiar partners) in different interaction situations, such as "a free-play period, a more structured period during which communicative demand was made on the child, and a face-to-face interaction" (Dawson et al., 1990, p. 335). There are no differences between them and the typically developing children, in either the duration or the frequency of the eye gaze toward their mothers' faces (Dawson et al., 1990).

Supports from the communicative environment together with support from communicative partners are effective in facilitating the success of communication in individuals with ASD (Prizant, 2006). Children with ASD may become more engaged in different activities and involved in the communicative environment, to some extent, as long as the environment is organized, activities are smoothly introduced to them by adults, they receive support in the form of cues at the right time, and their motivation is maintained

(Charlop et al., 1985). Accordingly, the impact of familiarity and the communication styles of conversational partners and different environmental and situational conditions on the performance of people with autism must be considered when assessing and studying communication and pragmatics in autism, in addition to focusing the abilities of individuals with ASD (Prizant, 2006).

2.4.4 Variation in pragmatic performance in individuals with ASD

Autism is a heterogeneous disorder and includes cases with varying degrees of function and characteristics and different levels of severity in symptoms (Loveland et al., 1990; Ochs & Solomon, 2004). For example, within the autism spectrum, there is a wide range of variation in individuals' language abilities and intelligence levels. Terms such as high- or low-functioning autism appear in some research to refer individuals with autism within or below the normal range of IQ and language abilities (Ochs & Solomon, 2004). Heterogeneity in language abilities can also be seen in the discourse competences of children with ASD, their language acquisition age, and whether they can acquire language or not (Ochs & Solomon, 2004; Waterhouse, 2013). To address symptom heterogeneity in autism, Happé et al (2006) propose three continuums of symptoms with different ranges of abilities. The first continuum is social behaviour, which includes social abilities ranging from normal to abnormal to severe impairment. The second continuum is communication, which refers to language abilities ranging from typical language to complete absence of language. Finally, the motor behaviours continuum includes behaviours ranging from typical to atypical to very repetitive and rigid (Waterhouse, 2013).

Heterogeneity and individual variation are central and necessary considerations for understanding autism and the impairments associated with it, including pragmatic impairment. Pragmatic deficits are reported to be universal in many studies and are found in most individuals with ASD (Landa, 2000; Norbury & Bishop, 2002; Tager-Flusberg et al., 2005; Brynskov et al., 2016). Many studies have found that the pragmatic performance of participants with ASD is more impaired than typically developing participants in different pragmatic tests that examine skills, such as conversational abilities, figurative language, and narrative abilities (Happé, 1993; Norbury & Bishop, 2003; Brynskov et al., 2016). However, some other studies also conveyed that there is heterogeneity among people with ASD relative to some pragmatic and discourse abilities (Baltex, 1977; Wetherby, 1986; Loveland et al., 1990; Ochs & Solomon, 2004; Volden, 2017). It has been found that some individuals with

ASD display typical pragmatic difficulties commonly reported in this population, while others perform at a level that is close to the normal functioning (Volden & Sorenson, 2009; Brynskov et al., 2016; Volden, 2017).

In a recent study investigating the pragmatic performance of 30 Danish children with autism, Brynskov et al., (2016) found heterogeneity in the pragmatic competence and performance of the children. Some of the participants demonstrated good pragmatic competence; they took turns appropriately and provided an appropriate amount of information in conversations. In contrast, other participants showed many pragmatic difficulties, including not considering the perspectives of other conversational participants and talking a lot about their interests and favourite topics (Brynskov et al., 2016).

According to Volden (2017), although pragmatic deficit is considered to be a defining feature of ASD, the nature and the source of this pragmatic dysfunction is still unclear because of the heterogeneity in the pragmatic profile of the population with ASD and the absence of specific profiles across all individuals with ASD. Most studies conducted in this field focus on highly intellectual individuals with ASD who function in the normal or above normal IQ range because they are more likely to be capable and have sufficient linguistics skills to engage in a social interaction and participate in conversation. Additionally, in most studies researchers want to isolate the effects of other problems that are sometimes associated with autism, such as mental retardation or hearing impairment, on pragmatic performance so that they can identify whether pragmatic problems can be attributed to autism (Volden, 2017). Therefore, more studies are needed that focus on different intellectual levels, including those with intellectual disabilities, to investigate the impact of the relationship between ASD and intellectual disability on pragmatic performance and understand the pragmatic profile of this population (Volden, 2017).

In summary, despite the existence of pragmatic impairment in most individuals with autism, pragmatic skills are not completely absent; instead, there is diversity in the prevalence of deficits and variation in the degree of deficit severity among people with autism, who have different levels of language and function (Norbury & Bishop, 2003; Brynskov et al., 2016). Research in the field of autism focuses more on the common features of autism rather than the diversity of the prevalence of these features among different individuals within the autism spectrum (Rogers & Williams, 2006). Therefore, further research is needed to explore this variation and describe it in more depth. Researchers should

also consider the diverse performances and skills of people with autism when designing studies and interpreting their findings (Rogers & Williams, 2006; Waterhouse, 2013).

2.4.5 Cognitive autism theories and pragmatic deficits in individuals with ASD

Studies on language development in individuals with ASD have focused on the cognitive basis of symptoms associated with autism to describe different behaviours and impairments found in this population (Rajendran & Mitchell, 2007; Lam, 2014; Volden, 2017). Thus, it is useful to consider different cognitive theories that may explain some aspects of the pragmatic, social, and communicative deficits in individuals with ASD. Given that autism is a spectrum of several types of disorders, with variations and heterogeneity (Volkmar & Klin, 2005; Volden, 2017), it is not possible to explain *all* aspects of symptoms and impairments among *all* individuals with autism with one theory. There are three key cognitive theories of autism, which are commonly used in studies in the fields of autism and pragmatics to help understand pragmatic impairments and explain why these deficits are found in individuals with autism (Landa, 2000). The three theories are, theory of mind deficit (Baron-Cohen et al., 1985); weak central coherence (Frith & Happé, 1994); and executive dysfunction (Ozonoff et al., 1991; Russell, 1997).

2.4.5.1 Theory of mind deficit

Theory of mind is a cognitive ability that enables people to understand that other people have beliefs, knowledge, and emotions about an event or an object that may differ from their own. Theory of mind is defined as the attribution of "mental states (such as beliefs, desires, intentions, etc.) to themselves and other people, as a way of making sense of and predicting behaviour" (Tager-Flusberg, 1993, p. 3). Observing the mental states of others directly is a difficult task, as these mental states need to be inferred which is essential for making sense of the social world, and this inference involves a complex cognitive mechanism (Baron-Cohen, 1988). According Baron-Cohen, different impairments found in individuals with ASD (e.g., pragmatic, social, and communicative) may be due to their poor theory of mind (Baron-Cohen, 2000; Baron-Cohen et al., 1985).

Many studies of both typical and atypical development have investigated the theory of mind ability (Baron-Cohen, 2000; Astington, 2001). In typical development, at the age of 4 years, children become aware of different mental states of others and can make assumptions about the feelings, beliefs, and intentions of others as a way of understanding the behaviours

of others (Kremer-Sadlik, 2004). In contrast, most children with autism are blind to the mental states of other people and suffer from *mind-blindness*, i.e., they cannot differentiate their own beliefs from those of others. Baron-Cohen et al. (1985) argue that this cognitive deficit impairs their pragmatics skills.

Deficit in the theory of mind provides an important explanation for many pragmatic deficits found in the language of people with autism (Baron- Cohen et al., 1985; Tager-Flusberg, 1993). As previously discussed in this chapter, pragmatics is the social use of language and depend on cooperation between communicative participants to create coherent discourse (Sperber & Wilson, 1995; Sadlik, 2004). In order to communicate effectively, a speaker needs to be aware of the listener's mental state because the listener has certain beliefs regarding what words mean. The listener tries to interpret the speaker's message the way it was intended. Both the listener and the speaker share some but not all information; and, finally, the listener presupposes that the speaker will be cooperative in their conversation; that is, they will be informative, truthful, relevant, and honest (following Grice's Cooperative Principle, 1975). Therefore, the theory of mind must be employed by both conversational participants to ensure the success of communication (Sperber &Wilson, 1995).

Impairment in pragmatic language and weakness in the theory of mind can be seen in the language use of individuals with autism and affects different pragmatic abilities. For example, in a conversational exchange, individuals with autism tend not to consider the perspectives of other conversational participants, lack awareness of what the listener may know and not know, do not use gestures to draw the attention of others, and have difficulties understanding the verbal and non-verbal expressions of others. Children with autism also lack the ability to pretend in play (Baron-Cohen, 1988; De Villiers et al. 2007a). Theory of mind impairment in individuals with autism also results in difficulties in understanding non-literal communication, such as irony, similes, metaphors, and sarcasm (McCormick et al., 2003; Paul et al., 2009), since non-literal language requires the individual to infer the meaning and the intentions behind the literal words.

A commonly used test to assess children's theory of mind ability is the "false belief task" (Wimmer & Perner, 1983). This test involves a story with a simple plot, in which one of the story's characters is not present in the room when an object is moved from its original place (which is known by that character). After hearing the story, the child is asked where the character will look for the object when they return (Baron-Cohen & Swettenham, 1997). A

more detailed example of the "false belief task" is the Sally–Anne test (Baron-Cohen et al., 1985). In this test, participants watch interactive events performed by two dolls, called Sally and Anne. The dolls play with a ball and then put it in a basket. After that, Sally leaves the room and disappears from sight, while Anne remains in the room and takes the ball out of the basket and puts it in a box in the same room. The participant is then asked where Sally will look for the ball when she returns. To pass this test, the participant (despite their knowledge that the ball was removed from the basket) should be able to infer the mental state of Sally and expect that she will look at the basket where she first left the ball (Sadlik, 2004; Rajendran & Mitchell, 2007).

In a study by Baron-Cohen et al.'s (1985), the majority (80%) of children with autism failed the false-belief task, demonstrating their difficulties in attributing the mental states of others. However, 20% of the children with autism in the study did pass the test (Happé, 1994). These results raise concerns about the universality of theory of mind deficits in individuals with autism (Ozonoff et al., 1991; Happé, 1994). As a result, Baron-Cohen (1989) developed a more difficult task, called the "second-order-false-belief task", to measure this ability accurately among children with autism. Using the revised task, not one of the participants with autism passed this test, while to 90% of typically developing children and 60% of children with Down syndrome passed the test. It was concluded that even if children with autism are able to pass the first-order-false-belief task (e.g., the Sally–Anne task), it is difficult for them to pass the second order task (Baron-Cohen, 1989; Rajendran & Mitchell, 2007). Although difficulty in this cognitive ability (theory of mind) is a core feature of autism, found in most people with autism (Tager-Flusberg, 1993; Baron-Cohen, 2000), evidence indicates that some individuals with autism pass first-order-false-belief tasks (Baron-Cohen, 1989; Happé, 1994; Rajendran & Mitchell, 2007). Some high-functioning individuals with autism have been reported to perform well in complicated tasks examining theory of mind (Ozonoff et al., 1991). Thus, deficit or lack of theory of mind should not be generalised to all individuals with autism.

In summary, not all aspects of impairment in autism can be attributed to the theory of mind deficit. This theory is, on the one hand, useful in explaining social impairment in individuals with autism, which likely results from their inability to recognize the feelings, emotions, and beliefs of others. On the other hand, the theory does not explain non-social deficits, areas of strengths and talent, and other behaviours commonly found in people with

autism, such as repetitive behaviours and focusing on details while ignoring the overall picture. Therefore, different theories must be considered when explaining different impairments in autism to account for all aspects (Rajendran & Mitchell, 2007).

2.4.5.2 Weak central coherence

Individuals with ASD have a unique cognitive style; they notice a very large number of details but are not always able to draw more general contextual meanings from this mass of information (Frith & Happé, 1994; Happé & Frith, 2006; Rajendran & Mitchel, 2007). These skills are often referred to as "local coherence" and "central coherence". Local coherence refers to short snippets of information and can be defined as "the ability to make contextually meaningful connections between information in short-term or working memory" (Jolliffe & Baron-Cohen, 1999a, p. 149). Central or global coherence refers to larger units of information, which are not stored in the short-term or working memory. Frith (1989) proposes the weak central coherence theory (sometimes known as global coherence theory) to explain the core difficulty that individuals with ASD have in using context to determine meaning. According to the weak central coherence theory, individuals with ASD lack the ability to process information by extracting and deriving an overall meaning from the mass of details in a context, and instead they process parts and details.

This theory, unlike other autism theories, could account for both difficulties and strengths in people with autism, such as talents and special abilities found in some individuals with autism (Frith, 1989; Rajendran & Mitchel, 2007). In some extreme cases, where individuals with ASD have special and even savant abilities that exceed those of the majority of people, it is obvious that they have an extraordinary ability to see minute details, remember them, and reproduce them, even when they do not comprehend their meaning as a whole (Plaisted, 2001). Weak central coherence and detail-focused cognitive style may account for good performance in intelligence tests as well, especially non-verbal tasks, in some individuals with autism. According to Tager-Flusberg (1991), people with ASD have strong memory for unrelated items and a common weakness in remembering related items. Weakness of central coherence may also be the cause for unusual linguistic skills among people with autism (e.g., the ability to remember word strings in a sentence but not remember the whole sentence), due to their deficit in using context to process global information and, instead, processing local details (Hobson, 2016). Indeed, the ability to focus on local detail, at

the expense of the bigger picture, offers some advantages in situations that require local congruence (Rajendran & Mitchel, 2007).

Mottron and Bellville (1993) performed an experiment to test the weak central coherence theory. In their study, a participant with ASD (with a talent in art) was asked to copy three-dimensional figures, some of which were geometrically impossible. The participant began by drawing a small detail, which he then built on until he finished the whole picture. In contrast, a control participant (a professional painter) started by drawing the overall structure and then filling in and adding details to complete the whole picture. The participant with ASD had no difficulty and was not slowed down when drawing the figures while the participant without ASD took considerably longer to draw the figures (Mottron and Bellville, 1993).

Jolliffe and Baron-Cohen (2001) developed a similar test to measure visuospatial skills in a group of individuals with ASD and a control group of typically developing individuals. Their experiment consisted of a set of line drawings that had been broken into fragments and designed as a puzzle. The participants' task was to reassemble the fragments into a whole object. The participants with ASD had difficulty in completing the task, and the Jolliffe and Baron-Cohen concluded that information integration is a main area of deficit in autism. These tests provide strong evidence for weak central coherence in individuals with ASD.

Additional methods have been used to test weak central coherence theory in relation to pragmatic language deficits. Jolliffe and Baron-Cohen (1999a) conducted a study in which individuals with ASD and a control group were asked to read texts containing homographs, such as *tear/tear*; one used in the context of the eyes, and one in the context of a dress (Jolliffe & Baron-Cohen, 1999a, p. 156). The performance of the participants with ASD (i.e., the appropriate use of context to pronounce the right homograph), was weaker than that of the control group. Jolliffe and Baron-Cohen concluded that the experiment "demonstrates that for those with autism or Asperger syndrome there is a preference not to process self-read material fully for meaning" (Jolliffe & Baron-Cohen, 1999a, p. 156). Similar results were found in a homograph reading test conducted by Frith and Snowling (1983). In their study, some participants with autism could not use the sentence context to choose the correct pronunciation of a homograph, even though they performed well and passed theory of mind tests.

Jolliffe and Baron-Cohen (1999a) conducted two additional tests in which participants were required to integrate general knowledge from short written texts and texts presented auditorily to make inferences about meaning. They found that participants with ASD were less able than a control group to infer the underlying meanings of the materials correctly. Interestingly, the ASD group were better able to remember the exact wording of the texts and audio material, even when they were unable derive the underlying meanings correctly. These results shows that individuals with ASD do not have a deficit in recall but a difficulty in pulling together information from different sources.

In another test of pragmatic language deficits, Jolliffe and Baron-Cohen (1999b) used the "story-interpretation test", which they adapted from a method previously used by Happé (1994). In this test, responses to stories that contain non-literal meanings are elicited from individuals with ASD. This test demands interpretation of the pragmatic function of an utterance, an expression, or a conversation rather than surface meanings alone. It involves not only knowledge of particular words and common expressions, but also an awareness of the patterns of discourse that people use to indicate different levels of meaning beyond the literal dimension. In this test, the researcher uses specific acts to indicate their attitude towards a statement or request, often presenting deliberately contradictory signals, which can be difficult for people with ASD to decode. For example, a story character who appears happy but may be expressing a genuinely positive emotion, or positive feelings out of irony or politeness, or another hidden motivation (Joliffe & Baron-Cohen, 1999b).

Jolliffe and Baron-Cohen's (1999b) study included 17 participants with autism, 17 participants with Asperger syndrome, and 17 control participants with neither disorder; participants were matched in age, IQ, sex, and left- or right-handedness. Their findings show that individuals with ASD and Asperger syndrome both provided more inappropriate mental state justifications than the control group. In contrast, individuals who do not have ASD used contextual information to identify the mental state of characters in the story. Participants with ASD were unable to determine the motivations behind certain references, or the mental state of characters who used language in a non-literal way, because they failed to draw on other relevant factors from the context, such as the social relationships of different characters. In short, the study showed that individuals with ASD tend to focus on the literal meanings of an utterance and fail to consider symbolic meanings or contextual factors that are relevant to the meaning of an utterance in a particular situation (Tager-Flusberg et al., 2005). Pragmatic

deficits can lead to false deductions and, therefore, misunderstandings of the true relationships in these stories, as well as difficulties in understanding connections, plot lines, and underlying messages.

Interestingly, individuals with autism and individuals Asperger syndrome in Jolliffe and Baron-Cohen's experiment (1999b) had no difficulty determining when a statement was at odds with the context, but they were often unable to explain why this was the case. Jolliffe and Baron-Cohen interpret this result as evidence of a difference between comprehension, which functioned quite well in individuals with ASD, and the integration of higher-level meaning, which was less successful in this group. They conclude that failure to provide context-appropriate mental state answers is indeed evidence of weak central coherence theory (Joliffe & Baron-Cohen, 1999b). At the same time, however, Jolliffe and Baron-Cohen acknowledge that there may have been problems in understanding some of the mental states involved, which would suggest the relevance of the theory of mind deficit, either instead of weak central coherence theory or in addition to it.

Many researchers have tried to find a link between the weak central coherence theory and the theory of mind deficit. According to Frith and Happé (1994), weak central coherence theory can be useful in supplementing and explaining some areas of deficit in autism that cannot be explained by the theory of mind deficit. As previously discussed, many aspects of impairment found in individuals with autism, such as deficits in communication, socialization, and imagination, may be attributed to a deficit in the theory of mind; yet this theory does not explain non-social impairment in individuals with autism that have been found in some studies (Frith & Happé, 1994). Thus, the weak central coherence theory provides a useful explanation of some characteristics and deficits found among individuals with autism and justifies the results of experiments on autism that cannot be explained by deficit in theory of mind (Frith & Happé, 1994). The weak central coherence is also the only theory that accounts for the superior skills found in some individuals with autism. Nevertheless, despite its importance, this theory cannot be considered universal and does not account for all individuals with ASD (Jarrold & Russell, 1997). Furthermore, weak central coherence is not exclusive to individuals with autism, and it is found in individuals with other disorders, such as Williams syndrome (Bellugi et al., 2000).

2.4.5.3 Executive dysfunction

Executive dysfunction theory may account for some of the deficits found in individuals with autism (Russell, 1997). Executive function can be defined as "an umbrella term for functions, such as planning, working memory, impulse control, inhibition, and mental flexibility, as well as for the initiation and monitoring of action" (Hill, 2004, p. 26). Executive function also refers to high-order processes necessary to control and regulate behaviours in an ever-changing environment (Robinson et al., 2009). Impairments in executive function are identified in people with many neurodevelopmental disorders, such as autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), and obsessive-compulsive disorder (OCD) (Hill, 2004). Deficits in executive function and poor performance among participants with autism in tests that examine executive function have been found in many studies (Ozonoff et al., 1991; Prior & Hoffmann, 1990).

Many of the characteristics usually found in people with autism may result from deficits in executive function. For example, executive dysfunction may cause impairment in the ability to plan, anticipate consequences, and self-monitor; it may also cause resistance to change and rigidity and inflexibility (Ozonoff et al., 1991). Executive dysfunction may result in difficulties in producing new responses to adapt to new demands, which negatively affect and limit people with autism's ability to adapt and become independent in everyday life (Happé & Vital, 2009). Evidence of the executive dysfunction can be found in the difficulties individuals with ASD often have in switching from one sensory mode to another or making choices between several alternatives (Dodd, 2005). New sounds, new people, and new situations are more challenging for people with autism because of their strong preference to persevere with one choice rather than sift through a range of new information and make another choice. The diverse problems that executive dysfunction accounts for show that this theory is clearly very broad. Thus, in empirical studies of autism, researchers generally focus on one aspect of the theory, rather than the theory as a whole. For example, Hill (2004), in her study of executive dysfunction in ASD, focused on three core aspects of executive function; namely, planning, mental flexibility, and inhibition, which are the areas most typically identified in people with ASD.

To test executive function in planning skills, for example, a test using a set of puzzles, known as the Tower of London task (Hughes et al., 1994) or Tower of Hanoi task (Ozonoff et al 1991; Hill, 2004) can be used. In this test, participants are asked to plan and execute the arrangement of set of beads or disks in a specific order. The time it takes to complete the

different steps of the task, including planning and execution, is used as a measure of executive function. Individuals with ASD take longer in these kinds of tests, especially in tasks where objects have to be moved (Hughes, 1996). To test executive function in mental flexibility, a test that requires participants to deduce rules for sorting by colour, shape, or number can be used; for example, the Wisconsin Card Sorting Test (Ozonoff et al., 1991). However, these tests often focus on the cognitive rather than linguistic aspects of ASD, and the implications for pragmatic deficits often remain unclear.

Studies that seek to identify specific pragmatic deficits in individuals with ASD have tended to focus on high-level cognitive skills (Eigsti et al., 2007). Human discourse involves many high-level cognitive skills, including planning what to say, listening to the input of others, organising utterances in a certain order or applying sets of rules, and flexibly in changing plans to suit a constantly shifting context. Landa (2000) found that various pragmatic problems in individuals with autism might be caused by deficits in executive function, such as "planning, shifting sets, working memory, and inhibition of prepotent responses" (p. 145). A lack of planning skills may be the reason for difficulties that people with autism have in providing the right amount of information in their conversations and in expressing new information, particularly in novel contexts (Landa, 2000). Moreover, deficits in shifting sets (the ability to shift attention from one task to another) in people with autism negatively affect their abilities to change speech styles when it is appropriate, such as changing from formal to informal style. Impairment in shifting function may also cause difficulty in considering the different interpretations of an utterance, such as understanding non-literal meanings and indirect speech acts (Ozonoff & Miller, 1996; Landa, 2000). Insistent questioning and the inability to terminate conversations or interactions appropriately can also be due to deficits of executive control function in people with autism (Landa, 2000). Finally, impairment in working memory may causes difficulties for people with autism in organising discourse appropriately in terms of formulating and integrating new information with previously mentioned information in the discourse (Landa, 2000).

Executive function can be used to understand the complex interrelations between different aspects of communication. Human speech is highly complex and involves multiple systems, including phonology, syntax, semantics, non-verbal rules, and rules about what it is appropriate to say on specific occasions. Deficits in any one of these areas can have impact on people; but in individuals with ASD, there often appears to be difficulty in drawing upon

data from all of these systems and making sense of them simultaneously. This may explain why individuals with ASD may perform well on single tasks that test comprehension, memory, or repetition but perform poorly in free tests, where natural interactions with other people occur. Landa (2000) notes that skills, such as eye contact, direction of attention, and decoding of non-verbal meaning, are learned in the first 2 years of life; failure to learn these skills lies at the heart of ASD pragmatic deficits.

Executive dysfunction overlaps, to some extent, with the theory of the mind deficit (Russell, 1997). The relationship between executive dysfunction and theory of mind deficit has been investigated by many researchers (e.g., Ozonoff et al., 1991; Happé & Vital, 2009). Some have argued that impairment in theory of mind leads to a deficit in executive function (e.g., Ozonoff et al., 1991). Others have stated that lack of executive abilities may cause deficits in theory of mind (e.g., Happé & Vital, 2009). Ozonoff et al., (1991) found that executive function deficits persist in most participants with autism even when they pass theory of mind tests; therefore, they classify deficits in executive function as a major deficit in autism that supersedes impairment in theory of mind.

Although executive dysfunction theory is an important framework for explaining many features of autism, not all people with autism have difficulties in executive function; and people who have deficits in executive function may have impairments in some functions, but not in others (Happé & Vital, 2009). The degree of impairment may also change during different developmental stages within a person (Russo et al., 2007). Furthermore, as Frith (1989) points out, executive dysfunction theory may be useful for analysing deficits that people with ASD have, but it fails to account for their strengths and special abilities, which persist alongside these deficits. Since this theory is also very broad, it is bound to overlap with theory of mind deficit and weak central coherence theory, and it is very difficult to apply in research due to the many variables it addresses.

In conclusion, although there is some evidence to support the theories discussed above, this evidence is somewhat inconsistent, and there are overlaps and ambiguities among the theories, making it difficult to reach conclusions about the nature of the link between cognitive processes and pragmatic deficits in individuals with autism. Theory of mind deficit, weak central coherence theory, and executive dysfunction theory are useful frameworks for understanding how some pragmatic language deficits arise; however, none of the major theories reviewed offers a complete explanation of the pragmatic deficits of individuals with

ASD. Despite many overlaps and apparent contradictions, each theory provides partial insight into different aspects of the wide range of pragmatic deficits that can occur in different groups and at different life stages, from childhood, through adolescence, and into adulthood (Cotugno, 2009). Theory of mind deficit is useful in explaining many aspects of the social and communication deficits in autism (Frith & Happé, 1994). Weak central coherence theory is useful in analysing specific locally-focused or centrally-focused task performance. Executive dysfunction theory is "perhaps the most influential of such general theories" (Happé, 1994, p. 107); and it is the only theory that accounts for both cognitive and motor skills in autism (Rajendran & Mitchell, 2007).

Therefore, a multi-deficit account, which includes different theories and explains different aspects of the cognitive deficit in autism (Baron-Cohen & Swettenham, 1997), may be the most useful approach to encompass the wide variation of symptoms and characteristics found in individuals with autism (Rajendran & Mitchell, 2007). Relating to pragmatic language deficit, the underlying cause of typical difficulties associated with ASD found in this study or reported by other studies can be explained and understood by referring to these theories. Therefore, various implications of the theories must also be considered when investigating pragmatic deficits in ASD, measuring pragmatic skills, and designing interventions for people with ASD.

2.4.6 Measuring pragmatic skills

 Measuring pragmatic skills is not an easy task as pragmatics refers to language in context which make it difficult to measure directly (Volden et al., 2009). Thus, assessing pragmatic skills requires focusing on a child's ability beyond a clinical setting and in a real-world context, such as in schools, homes, and the playground. Pragmatic language assessment is also a challenging task because pragmatics is affected by "the complex interaction of social, linguistic, cognitive, and cultural influences" (Adams, 2002, p. 973). According to Adams (2002), pragmatic assessment must be a comprehensive evaluation to provide sufficient information about the level of pragmatic comprehension, to identify both pragmatic strengths and weaknesses, and, finally, to identify the communicative partners' behaviours that may facilitate and improve pragmatic performance and communication.

Efforts (e.g., Bishop and Adams, 1998; Adams, 2002; De Villiers et al., 2007b) have aimed to provide a guide to pragmatic language assessment and intervention through analysis

of the conversational skills of children with communication problems. Researchers identify two main measure types for evaluating and assessing pragmatic and conversational skills in different populations, including individuals with ASD (Bishop, 1998; Adams, 2002; Volden & Phillips, 2010): direct measures of the behaviour of the participants themselves; and indirect measures (the perceptions of others) collected from the participants' parents, teachers, clinicians, and/or caregivers.

2.4.6.1 Direct measures

Direct measures are directed at the participants themselves. Various forms of direct measures are widely used in research, including conversation, interview, and language sample analyses and standardised language tests. Conversations and interviews are useful tools in highlighting contextualised pragmatic difficulties that cannot be captured by questionnaires or standardised measures (Adams, 2002). They provide deeper and more realistic insights into the pragmatic skills of individuals with ASD, as it may be difficult to apply available knowledge of general pragmatic rules in a real social context with ever-changing discourse (Paul, 2001).

Collecting natural language samples in various communicative contexts is another direct and beneficial tool in evaluating different linguistic abilities, including pragmatic and discourse skills (Evans & Craig, 1992). Natural language samples from informal contexts indicate the daily use of language more accurately and facilitate a better understanding of an individual's discourse and pragmatic skills. Collecting such samples can be done using different methods in different contexts. For example, by observing participants' communicative behaviour in everyday activities. This is one of the most widely-used methods in clinical and research situations for in-depth analyses of participants' language skills and real language performance (Fenson et al., 1994; Tager-Flusberg et al., 2009) and evaluation of different pragmatic behaviours (Young et al., 2005). Collecting natural language samples can also be done in free-play interaction with peers or caregivers, where a child's natural verbal interactions can be observed in a less structured environment (Evans & Craig, 1992).

However, the process of collecting natural language samples from everyday activities and free-play interaction, in a completely naturalistic and unstructured context, is a challenging task, as it requires more time to conduct and control (Fenson et al., 1994; Tager-

Flusberg et al., 2009). Therefore, it is more effective to use semi-structured procedures, wherein the researcher combines structured procedures and a natural situation (Bishop & Adams, 1989; Adams, 2002). In this way, the researcher can create an artificial social situation, similar to a real-life situation, and focus on stimulating particular pragmatics behaviours and responses (Bishop & Adams, 1989; Evans & Craig, 1992; Adams, 2002; Norbury & Sparks, 2013). The use of this method is beneficial in terms of the ability to control potential variation in language use and thus increases the reliability of the data collected (Evans & Craig, 1992).

Finally, standardised test, another type of direct measure, are essential formal tools for measuring children's linguistics levels because of their psychometric properties and high validity and reliability (Tager-Flusberg et al., 2009). Standardised tests are also a quick and easy to use measure for matching and comparing groups and creating language profiles of their skills by testing their performance in different language domains (Condouris et al., 2003). Standardised tests are useful in providing quantitative information and are widely used for screening in clinical situations to determine whether a child needs further evaluation. These tests are also objective assessment tools that are not influenced by subjective opinions, such as the data collected in caregiver reports (Young et al., 2005).

A wide range of standardised tests is available to measure numerous language domains that relate to language structure and vocabulary, but not for pragmatics (Bishop & Baird, 2001; Young et al., 2005; Reichow et al., 2008). The formal assessment tests to measure pragmatics that are available are not well developed in comparison to the tests for fundamental language skills (Young et al., 2005). Therefore, the use of standardised tools to assess pragmatic language, for example by language pathologists, is not sufficient nor effective in identifying pragmatic deficits and is unlikely to provide a comprehensive description of a child's pragmatic abilities (Volden & Phillips, 2010). Children with pragmatic problems generally perform better in standardised tests than in naturalistic settings, as these tests usually occur in a structured context with clear instructions (Bishop & Adams, 1989; Charman et al., 2003). In addition, these tests do not capture social communication difficulties that occur in dynamic and ever-changing communication contexts (Adams, 2002; Norbury & Sparks, 2013; Parsons et al., 2017).

Children with HFA or Asperger syndrome usually have sufficient linguistic abilities to answer formal questions in standardised tests, since the questions do not require the

application of specific pragmatic rules and social skills. As a result, children with HFA often get scores within the normal range in both IQ and language tests, which might provide an unrealistic impression and frequently overestimate their abilities, despite observed deficits in their communication and social use of language in everyday communication in naturalistic settings. Since such tests are commonly used to determine eligibility for different intervention services, including speech/language services, children with HFA or Asperger syndrome may be denied services and support because their performance in these tests hides their real weaknesses and difficulties (Young et al., 2005; Reichow et al., 2008; Volden & Phillips, 2010). Condouris et al. (2003), suggest that combining standardised language tests and measures of spontaneous speech in children with autism will provide a more comprehensive understanding of different pragmatic abilities and language deficits.

2.4.6.2 Indirect measures

Indirect measures are also used to assess and evaluate communication skills in populations with ASD. These measures are directed at people who share close rapport with the affected individuals, such as parents, and teachers, and include questionnaires, reports, rating scales, and checklists. Assessing pragmatic skills through the perspectives of someone who frequently interacts with the child is an alternative or complementary method to direct and standardised assessments. However, this method has many advantages and disadvantages. One of the advantages of this method is that the child is assessed based on his or her behaviours and use of language in an authentic environment, such as at home or school; therefore, it provides rich insights into their daily behaviour (Bishop & Baird, 2001; Charman, 2003; Constantino et al., 2003). In addition, as the measure is completed by someone who interacts with the child every day, it assesses language based on daily and typical use, without being affected by any variations that may occur from day to day (Volden & Phillips, 2010).

Indirect measures are useful in providing a comprehensive assessment of a large number of pragmatic skills, including behaviours that do not occur frequently and that cannot be detected in formal tests or clinical settings. For example, if a child tends towards an overliteral interpretation of the utterances of others, but this behaviour does not occur frequently, it is unlikely to be noticed in a clinical situation; whereas a person who communicates with the child regularly will be able to assess the child in this area and give

examples of this deficit (Bishop & Baird, 2001). Finally, these tools do not require much time, effort and money to administer and/or analyse (Bishop, 1998; Volden & Phillips, 2010).

Despite the importance of such tools in providing information about the performance levels of individuals with ASD (Reichow et al., 2008), they do not comprehensively explore pragmatic difficulties that are important to the development of effective intervention programmes. Furthermore, parent and teacher reports may not be entirely accurate, because caregivers' evaluations, especially those of the parents, are influenced by their subjective opinions; and they may sometimes overestimate their children' language abilities, especially their comprehension skills (Tomasello & Mervis, 1994; Luyster et al., 2008). Caregivers may overestimate their children's skills because children sometimes depend on their understanding of contextual gestures and familiar daily routines in their performance, and this can be inaccurately interpreted as an understanding of the language (Charman et al., 2003).

Another limitation of indirect measures is that they are generally completed by different people (e.g., parents, teachers, and clinicians), which creates inconsistency between different studies and raises questions about who is the best informant and the most accurate and reliable source of data to assess a child's abilities and behaviours. There is also a question as to whether there is an agreement or disagreement between the opinions of the different informants and whether to rely on a single source of information or on more than one opinion in evaluating children. Teachers and parents are the most important sources of information on children's performance (Moens et al., 2018). Parents have full awareness of their child's performance level across time and in different situations, and teachers have opportunities to compare the child with their peers and notice academic and social difficulties that may not occur at home.

King and Palikara (2018) investigated the correlation between the ratings of teachers and parents in a caregiver report, called the Children's Communication Checklist (CCC-2, Bishop, 2003), which examines children's abilities in different aspects of language structure and in pragmatic and non-linguistic behaviour. No significant difference was found between the teachers' and parents' ratings of children's abilities, including their pragmatic abilities. Constantino et al. (2003) also studied the consistency between the ratings of different informants, from different environments, and its influence on the evaluation of autism symptoms. They found a strong agreement between the views of different raters (i.e., mother, father, teacher). This finding increases the confidence in a single informant approach, as long

as information is supplied by an adult who interacts and observes the child regularly in a natural environment.

Murray et al. (2009) examined the relationship between the understanding and perceptions of parents and teachers regarding different aspects of the social behaviours of 54 children with autism. Results show an agreement between the parents and the teachers in their overall assessment of the children's social skills. In another study, on the behaviour of 505 typically developing and children with autism, modest agreement was found between the opinions of different informants (including parents, teachers, and psychiatrists) on behaviour measurements (Rapin et al., 1999). Szatmari et al.'s (1994) study of parents' and teachers' evaluation of the adaptive skills of 83 children with autism found agreement between the evaluations of the parents and the teachers.

Other studies, however, found that the assessment of children by others varies according to the environment in which they communicate with the child (Bishop & Baird, 2001) and the role of the informant in the child's life (Achenbach et al., 1987). The communicative environment, such as school or home, plays an important role in both the reliability and the accuracy of parents' and/or teachers' reports, because clinicians and intervention programme professionals frequently depend on these reports for diagnosing and assessing children (Lecavalier et al., 2004; Murray et al., 2009). Moreover, agreement between the views of raters who have the same role in the child's life is found to be greater than the agreement between those who play different roles in assessing the child's emotional and behavioural problems. A study conducted by Achenbach et al. (1987) found that the agreement between the opinions of two teachers was higher than the agreement between a parent and a teacher.

In summary, there is evidence of correlation between the views of different raters (Rapin et al., 1999; Constantino et al., 2003; Murray et al., 2009; King & Palikara, 2018), which supports the sufficiency of depending on a single informant in caregiver assessments. However, other studies (Achenbach et al., 1987; Bishop & Baird, 2001) did not find an agreement between different informants and recommend relying on different sources of information to provide a clear picture of a child's abilities (Murray et al., 2009).

2.4.6.3 A combined approach

While there are advantages and limitations in both direct and indirect measures, a combined approach of both direct and indirect assessment is beneficial in assessing pragmatic and conversational skills and in providing a comprehensive picture of pragmatic performance. Simmons et al. (2009) argue that information provided by a third-party should be complemented by direct observation of the individual. However, only a small number of studies combine caregivers' estimations of individuals' pragmatic abilities (indirect method) with the same individuals' actual performance (direct method; Reichow et al., 2008; Volden & Phillips, 2010; King & Palikara, 2018). The current study combines direct and indirect methods to study pragmatic abilities; yet, it differs from these studies in the measures used in this combination and their purposes, its study sample in terms of age, and the language skills it focuses on.

Volden and Phillips (2010), in their study on pragmatic difficulties in children aged 6–10 years, used a caregiver report called the Children's Communication Checklist-2 (CCC-2, Bishop, 1998) and measured participants' actual performance using a standardised test called the Test of Pragmatic Language (TOPL, Phelps-Terasaki & Phelps-Gunn, 2007). In contrast, the current study, which focuses on the pragmatic abilities of adolescents with ADS, a semi-structured conversation and a natural language sample were used to measure participants' actual performance. As previously mentioned, since linguistic abilities, especially pragmatics, develop and vary as one ages, it is best to avoid generalising the results of Volden and Phillips (2010) research on children to other age groups.

A recent study conducted by King and Palikara (2018) also studied adolescents with ASD using a combination of measures to assess language abilities. They collected data about participants' abilities from different sources. However, King and Palikara's (2018) research focus is not primarily on pragmatic abilities, but on other language skills as well, such as receptive, expressive, and narrative skills. Moreover, they relied on the caregivers' reports alone (teachers and parents) to assess the participants' pragmatic behaviour, using the CCC-2 (Bishop, 1998). The direct standardised language tests they used (the British Picture Vocabulary Scale PBVS, Dunn et al., 1997; and the Clinical Evaluation of Language Fundamentals, CELF, Semel et al., 2006), measured linguistic structure, syntax, and vocabulary but not pragmatic skills.

Finally, Reichow et al.'s (2008) study evaluated pragmatic assessments used in children and adolescents with ASD. Their study aimed to determine the validity of pragmatic

subtests in a standardised assessment called, the Comprehensive Assessment of Spoken Language (CASL, Carrow-Woolfolk, 1999). The participants' performance on the CASL was compared to the results of a parent report, using the Vineland Adaptive Behaviour Scales (VABS, Sparrow et al., 1984). The main objective of the study was to provide an additional standardised tool to measure pragmatic deficits in individuals with ASD and the parent report was used to examine its validity. Therefore, the main purpose of integrating these two kinds of assessment tools (caregiver report and direct measure) in Reichow et al.'s (2008) study was different from the motivation of the present study, which uses the combined approach to understand and obtain a comprehensive picture of different pragmatic skills in the participants with ASD. In summary, as both direct and indirect measures are useful in assessing pragmatic language and identifying language deficits, in order to develop a better understanding of pragmatic abilities in the ASD population, a comprehensive assessment of pragmatic skills is one that includes both direct measures of the actual behaviour of the participants themselves, and measures of the perceptions of others (Condouris et al., 2003).

In this section, pragmatic deficits in ASD were discussed in detail and different themes relating to pragmatic deficits in ASD were presented, including the common pragmatic language difficulties found in the language of individuals with ASD, variation in pragmatic performance in ASD, and possible factors that may affect pragmatic performance. Three major cognitive theories that help explain pragmatic deficits in ASD were presented as well. Finally, methods of measuring pragmatic skills were discussed. After reviewing different aspects relating to pragmatic deficits in ASD, it is worth reviewing the general setting concerning ASD in Saudi Arabia in the context of the current study. The current situation of people with ASD in Saudi Arabia can be discussed from two main perspectives: support and services for people with ASD and the challenges that might face them in Saudi Arabia.

2.5 Autism in Saudi Arabia

This research focuses on the pragmatic skills of Arabic-speaking adolescents with ASD in Saudi Arabia. In this section, an overview of the Saudi context is presented to offer a basic understanding of aspects related to individuals with ASD in this community. The current situation of people with ASD in Saudi-Arabia is discussed in terms of the support and services available to them; and the challenges of ASD diagnosis, research, and awareness about ASD in Saudi Arabia. The section begins with a brief overview of autism in Arab countries.

2.5.1 Autism in Arab countries

Although recognised occurrences of ASD have increased throughout the world, Arab countries differ from Western countries in the way they address this issue. This difference is perhaps due to the paucity of ASD literature in the Arab countries compared to the West, and the lack of accurate reports about the distribution of ASD in the Arab world (Alnemary et al., 2017a). The lack of accurate data on the prevalence of ASD in Arab countries may be because of the difficulty of accessing diagnostic services and the shortage of paediatricians experienced in autism diagnosis, compared to Western countries (Helmy, 2017). Parents in Arab countries are also more likely to lack awareness of autism and its symptoms, especially if the symptoms are not severe and clear, thus both delaying and affecting the diagnosis and treatment of their children (Alamri & Tyler-Wood, 2016).

Among the available literature about autism in Arab countries, is a study by Hussein and Taha (2013) in which they reviewed 75 internationally published studies (in English) between 1992 and 2012. The reviewed studies were from different Arab countries and focused on different fields of autism studies. Most of the published studies were from Saudi Arabia (31%) and Egypt (20%) and focused on aetiology, which explains the abundance of medical studies in these countries compared to studies of other aspects of autism. Another review, by Alnemary et al. (2017b), included 142 articles about autism, published between 1992 and 2014. Most of the published studies were from Saudi Arabia, Egypt, and Oman. Although Alnemary et al. (2017b) found a larger number of studies from Saudi Arabia and Egypt, indicating increased interest in autism in these countries, there continues to be a need for more research on diagnosis and intervention services in all Arab countries.

2.5.2 Support and services for individuals with ASD in Saudi Arabia

In recent times, Saudi Arabia has undergone rapid and noticeable development, as Saudi rulers have committed to modernity, along with the oil wealth in Saudi Arabia, which has positively influenced the quality of life of Saudi citizens. Development can be seen in all areas of life in Saudi Arabia, including social and cultural life, as well as in various services and infrastructure. Millions of dollars have been budgeted for the development of education, healthcare, transportation, and communications (Alnemary et al., 2017a). These development efforts have been accompanied by the preservation of the country's traditions, culture, and customs.

Recently, the Saudi Arabian government has established a comprehensive plan, *Vision 2030*, for the overall development of the country. Vision 2030 pays special attention to people with special needs in Saudi Arabia. It commits to facilitating the access of people with special needs to free and appropriate services from all government agencies in the country (Alquraini, 2010); and to ensuring that they receive full rights, in terms of education, healthcare, training, rehabilitation services, and employment. An example of this is the opening of the *Sinad City* for Special Education by the Saudi Ministry of Education in 2018, in the city of Mecca. The purpose of this project is to provide diagnostic and therapeutic services, early interventions, and education for children with autism and Down syndrome, from the age of 3 years. With a capacity for more than 1000 students, Sinad City provides more than 250 treatment sessions daily. It also has rehabilitation and accommodation services and is considered the largest project of its kind in the Middle East (Saudi Ministry of Education, 2019).

According to Battal (2016), the services for people with special needs have improved and extended to small towns in Saudi Arabia. In the past, most of the special needs services and specialised schools were found in larger cities (i.e., Riyadh, Makkah, Madinah, and Jeddah); and access to relevant services was extremely limited outside of these cities (Zeina et al., 2014; Alnemary et al., 2017a). Today, there are approximately 112 day-care centres and 35 rehabilitation centres serving children with special needs and developmental disabilities, including children with ASD, across the country (Alnemary, 2017). In addition, the government offers various privileges and support to people with special needs, including academic tuition fees, monthly living expenses, free transportation, flight discounts, and

scholarships (Battal, 2016). For example, the government sponsors study abroad for some children with special needs and pays for their travel expenses. 800 Saudi children with special needs, 10% of whom are autistic, receive services and special education in Jordan funded by the Saudi government (Alnemary et al., 2017a).

The Saudi government and other related organisations are now directing increased attention to supporting individuals with ASD (Awwad, 2012). A significant budget has been devoted to establishing educational programmes, projects, and centres with the purpose of supporting the population with ASD in the country. These efforts also manifest in the government's cooperation with research centres and universities throughout the world (Awwad, 2012). In addition, universities in Saudi Arabia have established departments with targeted courses to increase the average student's knowledge about ASD and special needs in general. After graduation, students keen on supporting individuals with ASD can offer direct aid in several ways (Almasoud, 2013). The Saudi government also provides students who have graduated with scholarships in the fields of autism research, basic or medical, and cover the fees of private schools for children with ASD as well (Alnemary, 2017; King Salman Centre for Disability Research, 2019).

Yet, despite these efforts by the government, and the large budget allocated to serve people with special needs, there is still a dearth of services and a gap between the laws and their implementation in practice (Al-Jadid, 2013). The available services in Saudi Arabia have not yet attained the required level to meet the needs of children with ASD (Alotaibi & Almalki, 2016). The substantial efforts and advances made by a number of organisations have not translated into significant improvements with respect to the quality and quantity of available services for people with ASD, and only a limited number of children with ASD benefit from government services (Mazin, 2011).

2.5.3 Challenges of ASD diagnosis in Saudi Arabia

The diagnosis of autism remains a problem in Saudi Arabia, and around the world, and requires the attention of teachers, parents, clinicians, and professionals. However, diagnostic services and general support for people with ASD in developed countries, where much of the research and innovation has emerged, exceed those of developing countries, where there is a lack of research, expertise, and trained professionals in this area; low levels of health care services; and beliefs, customs, and economic problems, which may impede

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services and supports (Mashat et al., 2014). In the Saudi context, there is a shortage of trained people, who are competent in the diagnosis and treatment of the increasing number of people with ASD in Saudi Arabia (Helmy, 2017). Parents who have received diagnostic services for their children with ASD in Saudi Arabia, indicate the need for more access to diagnostic and therapeutic services and for support following the diagnostic process (Alnemary, 2017). Lack of awareness about autism and its symptoms may lead to a late diagnosis, or even a misdiagnosis, of individuals with ASD. Some parents in Saudi Arabia do not seek early help or diagnosis, despite their fears that there may be something wrong with their children's development and the appearance of early autism signs in their children (e.g., lack of eye contact, issues with language and communication).

The differing intellectual abilities of individuals with ASD may also hinder the diagnosis of autism in Saudi Arabia; for example, students with high-functioning autism often remain undiagnosed due to the fact that their parents and teachers do not recognise the symptoms, since autism symptoms are often masked by their normal IQs or their good language abilities (Zeina et al., 2014; Alamri & Tyler-Wood, 2016). Misconceptions about the possible causes of autism among parents of children with ASD in Saudi Arabia are also an obstacle. Alqahtani (2012), in his study about the beliefs of Saudi families of children with autism (N=47), found that parents attributed autism to various causes, which have been rejected, proved to be false, and are no longer accepted today, including vaccinations, lack of emotion among parents, and other non-medical, cultural beliefs. Although genetic factors are considered a possible cause of autism (CDC, 2018; WHO, 2017), some parents of children with ASD in Saudi Arabia lacked awareness of this cause (Alqahtani, 2012).

It is important to consider genetic factors when studying the prevalence of ASD in Saudi Arabia because consanguineous marriage (i.e., marriage between first and second cousins) is common in this country, as is the case in other Arab countries (Al-Gazali et al., 1997). In Al-Salehi et al.'s (2009) study of 49 children with ASD in Saudi Arabia, 14 (28.57%) had a history of marriage between relatives. Although Al-Salehi et al.'s study does not suggest a direct link between consanguineous marriage and the prevalence of autism in Saudi Arabia, it draws attention to this as a possible cause and suggests the need for further genetic studies of Saudi families with a high rate of autism.

2.5.4 Challenges in conducting ASD research in Saudi Arabia

The current situation of ASD in Saudi Arabia presents researchers and educational professionals with significant challenges. Researchers in Saudi Arabia face obstacles when attempting to do research on people with difficulties and special needs. For example, the unwillingness of some parents to participate in research, complete questionnaires, or let their children participate in experiments negatively affects the quality and quantity of research in Saudi Arabia. In Alqahtani's (2012) study of parents' beliefs about autism in Saudi Arabia, some parents refused to participate because they were uncomfortable discussing their children's issues with the researcher. People in Saudi Arabia are more conservative in some areas regarding their children, such as disability, which makes them less likely to be responsive when these issues are discussed with them (Mashat et al., 2014).

Additionally, another problem facing researchers in Saudi Arabia is the difficulty of collecting data from both genders (male and female) when their research requires it, because of gender segregation in some places, such as schools and universities, due to social and cultural rules. For example, in collecting data through testing, observations, or conducting interviews with both genders, it is difficult for a female researcher to access male public schools or vice versa. This was a major problem encountered by Alqahtani (2012) when trying to interview mothers of children with autism. Instead, researchers might assign another person of the same gender as the participants to collect data (Alqahtani, 2012).

Finally, the most challenging difficulty researchers in Saudi Arabia face when conducting research is the lack of assessment tools in Arabic for screening and diagnosing autism and for evaluating different skills in people with ASD. Assessment tools should be appropriate to the research context and its participants, in terms of environment, culture, and language, so that they are as effective as possible and accurately measure what they intend to measure (Mohamed et al., 2016; Helmy, 2017). This is especially important when assessing people with special needs, such as individuals with ASD, as this diagnosis and assessment will be followed by action, in terms of treatment, support, and intervention (Shaalan, 2009). Many of the available tools for assessing Arabic speakers in the Saudi context and in the Arab world, in general, have been translated from western tools; there is need for reliable and valid assessment tools in Arabic that incorporate the language structures and the culture of Arabic-speakers (Mohamed et al., 2016; Aldosari et al., 2019).

Lack of knowledge, research, and assessment tools in Saudi Arabia, leads professionals to depend on Western literature for information regarding autism, which is

reflected in both diagnostic services and in the design of intervention programmes for individuals with ASD in the country (Alotaibi & Almalki, 2016). Further research into the difficulties that individuals with ASD experience within the Saudi context will help close the research gap, contribute to identifying the needs of learners with ASD in Saudi Arabia, and provide much needed advice to those working with individuals with ASD.

2.5.5 Lack of awareness among families, teachers, and the public about ASD in Saudi Arabia

Lack of awareness among people who share close relationships with individuals with ASD, such as parents and teachers in Saudi Arabia, has been reported in many studies (e.g., Almasoud, 2011; Alqahtani, 2012; Alamri & Tyler-Wood, 2016). Lack of knowledge and understanding of the different behaviours, symptoms, and needs associated with ASD may have negative impact on seeking diagnosis, help, and treatment for individuals with ASD. This lack of understanding among some families may also lead to denying their children's disability, feeling ashamed of them and hiding them from the society, which hinders the process of their diagnosis and their development (Almasoud, 2013). Some factors related to the parents of a child with ASD have a significant impact on supporting their child such as their educational level, income and culture (Ravindran & Myers, 2012; Alnemary et al., 2017a).

Some teachers in Saudi Arabia also lack the ability to recognise the symptoms of autism in their students, which may delay diagnosis and support (Almasoud, 2011). In addition, insufficient training available for teachers and instructors and their lack of experience and awareness of how to identify and address the educational needs of individuals with ASD hinder the inclusion of children with ASD in regular schools in Saudi Arabia. Some schools in Saudi Arabia are unable to accommodate these children due to this lack of teachers' knowledge and facilities in public schools, (Almasoud, 2011). Although, the number of beneficiaries from the educational services for people with special needs in Saudi Arabia increased from 5,208 students in 1992 to 36,461 in 2015, which is significant evidence of the improvements in this area (Battal, 2016), only about 1,362 students with ASD were served by the government educational system, which includes a total of 5,137,839 students aged 5 to 18 years (Saudi Ministry of Education, 2015, as cited in Alnemary et al., 2017a). Most children with ASD in Saudi Arabia either study in private centres in Saudi Arabia or travel abroad to

study in countries, such as Jordan, the United States, or the United Kingdom (Alqahtani, 2012; Alnemary et al., 2017a).

Increasing public awareness and people's understanding of the condition of people with ASD is an important and necessary goal, since ASD affects all levels of society, from individuals with ASD and their families, to the general community in Saudi Arabia (Alotaibi & Almalki, 2016). In a study by Alsehemi et al. (2017) on public awareness about ASD in Saudi Arabia, which also included teachers and healthcare providers, numerous false conceptions and information about autism were found. Examples of these false beliefs include that autism is linked to the children's use of electronic devices and to parenting practices, and children with ASD should not attend regular schools. Nonetheless, some of the participants in the study were aware of the symptoms of autism and the need for support and education for these children (Alsehemi et al., 2017). Public awareness can be achieved with educational campaigns directed at the public, explaining both the characteristics of autism and the special needs of individuals with this disorder. Without public awareness and the appropriate support, being in public places will be extremely difficult and challenging for individuals with ASD and their families. A well-informed society will be more tolerant and non-judgmental about these individuals and thus improve the quality of their life (Almasoud, 2011; Alsehemi et al., 2017).

In summary, the overview of the conditions of people with ASD in Saudi Arabia highlights a lack of awareness and knowledge about autism, its symptoms and related behaviours, among some parents and teachers of individuals with ASD, which may affect the reliability of their assessments of their children or students. At the same time, they are important sources of information for research due to their regular contact with the children in their daily lives. In addition, researchers in Saudi Arabia face many challenges, challenges which I have also faced in this research, including the unwillingness of some parents of children with ASD to participate in research on the conditions of their children; this reluctance may affect the quality and quantity of research in Saudi Arabia.

This overview also highlighted a general lack of research related to autism, which negatively affects the awareness of the community and all those (parents, teachers, and professionals) who can be involved in helping and improving the life of people with ASD. Finally, a gap in assessment tools for people with ASD in Arabic was also presented. Most available and commonly-used tools in the Saudi context are translated from western tools,

which may negatively affect the assessment of different abilities among people with ASD in this country and effective interventions for their impairments. Presently, people with ASD in the Saudi context require improved diagnoses and educational services, more research and assessment tools, and increased public awareness. Nonetheless, recent advances and developments in services, early interventions, and education programmes for people with autism in Saudi Arabia offer great promise for further advances in this area in the country and in Arab countries in general (Zeina et al., 2014).

2.6 Summary

This chapter provided an informative review of literature about different aspects related to the current research, divided into four main areas: pragmatic language, ASD, pragmatic deficits in individuals with ASD, and ASD in Saudi Arabia. The literature on pragmatic language provided an overview of pragmatic competence, the acquisition of this ability in typical development, and how pragmatic language is linked to and affected by concepts such as context and culture. Four important pragmatic theories were also introduced and discussed to enhance and expand the knowledge about pragmatics in general, and one of those theories (Grice's cooperative principle) was used as a theoretical framework in the current study for analysing some of the research data.

The second section presented the literature about ASD as a developmental disorder and discussed its wide prevalence around the world and different environmental, biological, and neurological aetiologies that might cause it. The main diagnostic criteria of ASD, which are deficits in social communication and social interaction and the preference for restricted and repetitive behaviour (APA, 2013), were also presented and discussed. This section also reviewed some other issues commonly found in individuals with ASD, such as sensitivity to light, sensitivity to noise, and sleep problems, as well as some special abilities associated with ASD, such as talents in drawing, music, and math.

Pragmatic deficits in ASD were discussed at length in the third section, as they are the predominant topic and the main focus of this study. Previous studies and literature on the common pragmatic difficulties in ASD were reviewed, with a greater emphasis on four main pragmatic areas of deficit which are the main areas of this research investigation: discourse management, communicative functions, conversational repair, and presupposition. This chapter also presented different cognitive theories (theory of mind deficit, executive

dysfunction, and weak central coherence) by which some pragmatic deficits might be explained. The heterogeneity and variation in pragmatic performance found in some individuals with ASD and possible factors affecting this pragmatic performance in individuals with ASD, such as a supportive, communicative environment and a familiar conversational partner, were also discussed in this section. Finally, this section reviewed the different assessment methods commonly used to measure pragmatics, including direct and indirect measures, and highlighted different issues related to measuring pragmatic skills. A combined and integrated approach, including both direct and indirect measures (which is adopted by the current research), was also presented.

Finally, the last section of this chapter reviewed literature about the context of this study (Saudi Arabia) and the situation of people with ASD in that context, including the services and support provided to them and the difficulties that face them. However, this review also highlighted significant gaps in the literature with regard to the lack of research relating to ASD in Saudi Arabia and raised the need for further research in the different areas of autism in general. It also drew attention to the difficulties that accompany the measurement of pragmatics; despite the many suggestions in the literature about the importance of obtaining a comprehensive evaluation of pragmatics and not only relying on one source of information, there is still a lack of studies that use an integrated and comprehensive approach in the assessment of pragmatics.

Chapter Three: Methodology

3.1 Introduction

This chapter outlines the procedures and methods used in conducting this study. The study employs mixed methods, between-subjects design to identify and understand the pragmatic and conversational skills inherent in the language of adolescents with autism spectrum disorder (ASD) in Saudi Arabia by comparing them to typically developing (TD) adolescents. The chapter begins with an overview of the research study design followed by detailed explanations of the participants' characteristics (TD adolescents, adolescents with ASD) and the inclusion criteria for each group, as well as the matching procedures, study sites, and recruitment procedures. Thereafter, the data collection tools (the YiPP, PPECS, and free language sample) and procedures, translation tools, and pilot study are explained in detail. An overview of the analytical methods (quantitative and qualitative [i.e. discourse analysis]) used to answer the research questions is also presented. Finally, ethical considerations, as well as the reliability and validity of the research tools, are discussed.

3.2 Research Design

Measuring pragmatic language skills entails many challenges, as discussed in the review of the literature (see Chapter Two). In order to obtain as full a picture as possible of all aspects of the pragmatic and conversational features of adolescents with ASD, a mixed-methods approach was used in this study. A mixed-methods approach allows for the gathering of data using both quantitative and qualitative methods (Cresswell & Clark, 2017). According to Creswell and Clark (2017), using a wide range of methods helps overcome the weaknesses of the qualitative or the quantitative methods when used separately. In addition, the use of multiple methods increases the quality and validity of the collected data, which makes it possible to draw generalisations based on the findings (Denscombe, 2014). A mixed-methods approach is useful in investigating items from different perspectives instead of depending on a single source of information. It also allows researchers to obtain sufficient data and provide a more comprehensive understanding of the investigated subject by gaining both numeric data from quantitative measures as well as contextual understanding from qualitative data (Klenke, 2016). In this study, participants' pragmatic ability was measured using different sources of information (the caregivers' perceptions and the ASD and TD

adolescents' performances) and different forms of data collection: quantitative (semi-structured conversations, questionnaires) and qualitative (samples of natural language).

3.3 Participants

Two subject groups participated in this study, namely, adolescents with ASD and TD adolescents and their caregivers.

3.3.1 Adolescents with ASD

Fifteen Saudi Arabian adolescents with ASD (10 male and 5 female), who are native Arabic speakers and between the ages of 10 and 17 years, participated in this study. The participants with ASD were recruited from special-needs centres in the cities of Mecca and Jeddah, in the western region of Saudi Arabia. At the time of the study, the participants were not institutionalised in private-care facilities but were living with their families and attending special programmes in private-care centres for people with autism and special needs. Purposive sampling, with specific criteria, was used to select the ASD participants for the study. Since it was difficult to find people with ASD who met the study criteria, this was the best possible sampling method.

3.3.1.1 Inclusion criteria

The inclusion criteria for the ASD participant group were: age (10–17 years old); ASD diagnosis; no additional disabilities, such as sight or hearing loss; and IQ within the normal range (85–104). All participants had received a formal diagnosis of ASD by specialist clinicians in governmental hospitals or private clinics under the umbrella of the Saudi Ministry of Health (MOH). MOH commonly depends on DSM-5 and the International Statistical Classification of Diseases and Related Health Problems, ICD (ICD-10; WHO, 1992) in their diagnosis of autism (MOH, 2019).

Participants' non-verbal IQ was measured using Kaufman Brief Intelligence Test (KBIT, Kaufman & Kaufman, 2004) and their verbal ability was assessed using an adaptation of the Test for the Reception of Grammar (TROG), which measures receptive grammar (Bishop 2003); and the British Picture Vocabulary Scales (BPVS), which measures receptive vocabulary (Dunn & Dunn, 2009). In fact, given the considerable variation and heterogeneity of language and cognitive abilities common in the population with ASD (Dodd, 2005; Tager-

Flusberg et al., 2005; Paul et al., 2009), it was important to include only adolescents with ASD who are verbal and in the normal range of IQ because they were more likely to understand instructions and have the language skills required to engage in conversation (Volden, 2017). Different language and IQ measures are discussed in more detail in Section 3.3.5. Participants' results in these tests are presented in Section 3.3.6.

3.3.1.2 Research sites (care institutions)

This study was conducted in two main special-needs care centres. These centres are among the leading social institutions in the field of special needs in Saudi Arabia, which seek to spread the culture of supporting people with special needs and increase society's awareness of their rights. The centres provide various high-quality services, include professional staff, and follow an educational approach that is compatible with the social environment of children with ASD in Saudi Arabia. The fundamentals of this educational approach are derived from programmes in America and Europe.

The main objectives of these centres can be summarised in four main points: First, providing educational and emotional support to assist people with special needs and their families. Second, providing people with special needs fundamental skills to help them integrate into society and increase their families' knowledge about dealing with special-needs issues. Third, offering rehabilitation, specialised education, and training through individual and group counselling programmes, applying behavioural and cognitive training and education. Finally, focusing on structured training and the creation of new activities in an attempt to rehabilitate people using natural exercise, as in their daily life.

3.3.2 TD adolescents

Fifteen Saudi Arabian adolescents with typical development (10 male and 5 female), who were native Arabic speakers and between the ages of 10 and 17 years, were recruited to take part in this study. These participants were recruited through community resources and local social groups in Mecca and Jeddah. A mix of voluntary response sampling and purposive sampling was used to select TD participants for this study. First, the participants' parents were asked if they would allow their adolescent child to participate in the study and; second, specific selection criteria were applied. Data collection took place at participants' homes.

3.3.2.1 Inclusion criteria

The inclusion criteria for the TD group were age 10–17 years old, typical development, no history of a developmental disorder, and IQ within the normal range (85–104). Parents of potential participants were asked if their child had a history of developmental problems, especially in terms of language ability; and if they received any special-needs education. Verbal ability and non-verbal IQ were measured using the KBIT, TROG, and BPVS tests. A summary of the participants' characteristics is presented in Table 3.1.

3.3.3 Caregivers (parents and teachers)

The caregivers of the participating adolescents spent a great amount of time with them, communicating and interacting; therefore, the caregivers were expected to have sufficient experience of the adolescents' pragmatic behaviours to be helpful in understanding their conversational behaviours and problems.

Fifteen caregivers from each participating adolescent group (ASD and TD) were recruited to complete a questionnaire about the adolescents' pragmatic behaviours and difficulties. In the TD group, the parents completed the questionnaire; whereas in the ASD group, the teachers completed the questionnaire. The reason for the difference between the caregivers in each group was that permission to access public schools to collect data from the teachers of the TD adolescent participants was not granted and some of the parents of the adolescents with ASD were not willing to participate.

However, many studies investigating social, communication, and language skills in children and adolescents with ASD (e.g., Rapin et al., 1999; Constantino et al., 2003; Murray et al., 2009; King & Palikara, 2018) report agreement among the responses of different informants, such as parents, teachers, and clinicians (See Chapter Two, Section 2.4.6.2 for more information). These studies support the inclusion of different caregivers as long as they regularly communicate and interact with the child and observe them regularly in their natural environment. Moreover, the adolescents with ASD studied in centres dedicated to people with special needs; thus, their teachers were responsible for teaching academic skills as well as other skills, such as social and communication, making them sufficient sources of information about the participants' different abilities.

3.3.4 Participant recruitment

To recruit participants, I initially met with the directors of care centres in Mecca and Jeddah. I explained the aim of the study and the inclusion criteria and asked the directors to identify students who are verbal and met the study criteria. This selection procedure might be biased to a certain extent, since the directors might have referred the most able adolescents to participate in the study. However, restricting the age range (10–17 years old) might be an important factor that reduced this bias because at the time of the data collection there were fewer adolescents with ASD than children with ASD. Despite this concern, using this selection procedure was the best available course of action in the context of this study. Testing a wide range of participants with different cognitive and language abilities was not feasible due to time and accessibility restrictions. However, the recruitment of participants is always a challenging task in research dealing with participants with ASD and is associated with biases in sampling selection (Warnell et al., 2015).

Families of the adolescents with ASD and the TD adolescents were contacted before the study began. Information sheets for both caregivers and adolescents, explaining the research aims, methodology, and participant roles in the study were sent to them with consent forms (See Appendices 1, 2, and 3). The parents of adolescents with ASD were contacted through the special-needs care centres, and I contacted the parents of TD adolescents directly.

Parents of TD participants were willing to participate in this research and gave permission for their children to participate too. However, some of the parents of adolescents with ASD were not willing to participate themselves, but they gave permission for their children to participate. Thus, the caregiver's data for this group were collected from their teachers instead of their parents and both parents and teachers of participants with ASD were given and signed the necessary documents (consent form and information sheet) in advance of the fieldwork.

3.3.5 Verbal ability and non-verbal IQ measures

Various verbal and non-verbal measures are commonly used by researchers for different purposes, including identifying study participants, determining participants' language and IQ level, matching groups, and examining language impairments. These tests are commonly used for matching participants in studies of individuals with different

disorders, such as ASD, Asperger syndrome, and specific language impairments. (e.g., Ziatas et al., 2003; Perovic et al., 2013; Janke & Perovic, 2015).

In this study, verbal language measures (TROG and BPVS) and a non-verbal IQ measure (KBIT) were used to assess participants and to determine their eligibility and enable matching between the TD and ASD participants. These tests were completed before the main study's data collection in separate session. After receiving the consents from participants' caregivers, the language tests (BPVS and TROG) were administered first, followed by the IQ test (KBIT). Participants with ASD were tested in the care centres and TD adolescents were tested in their homes. After each test, there was a break to reduce the pressure on the participants. I administered the tests (PPBVS, TROG, and KBIT) according to the instructions in the examiner manuals (TROG, Bishop, 2003; BPVS, Dunn & Dunn, 2009; KBIT, Kaufman & Kaufman, 2004).

3.3.5.1 Test for Reception of Grammar (TROG)

The Test for Reception of Grammar (TROG, Bishop, 2003) is a standardised measure of receptive grammar. It is appropriate for children aged 4 years to adults, for assessing grammar comprehension in different clinical groups, such as individuals with specific language impartment (SLI), with ASD and hearing loss (Bishop, 2003). TROG is useful in determining a child's level of comprehension, comparing it to other children in their age group, and identifying difficulties. The test consists of 20 categories that measure different grammatical constructions ranging in difficulty, which is gradually increased as the participant progresses. During the test, the examiner utters a sentence, and the participant must choose the picture (out of four pictures) that matches the sentence. The test takes approximately 10 to 20 minutes to complete.

3.3.5.2 British Picture Vocabulary Scale (BPVS)

The British Picture Vocabulary Scale (BPVS, Dunn & Dunn, 2009) is a measure for receptive vocabulary. The test is used for children aged 3–16 years to assess vocabulary development and detect any delay and impairment in this ability. It is simple and easy to administer and takes approximately 10 to 15 minutes to complete. During the test, the examiner utters a word, and the child must choose the picture (out of four pictures) that best matches and illustrates the meaning of the word. The test does not require reading nor a spoken response (child can answer by pointing), which makes it suitable for young children

who cannot read yet as well as children with language impairment, ASD, or communication difficulties and non-native English speakers.

3.3.5.3 Kaufman Brief Intelligence Test (KBIT)

The Kaufman Brief Intelligence Test (KBIT, Kaufman & Kaufman, 2004) is used to measure intelligence in people aged 4–90 years. It is an easy and quick test and can be used in different settings, including educational, clinical, or research contexts and for a variety of purposes, such as assessing intellectual abilities, identifying gifted people, and evaluating the cognitive abilities of students at risk for learning disabilities. The test includes measures of both verbal and non-verbal intelligence; and each measure can be used independently, or the scores of both scales can be combined to obtain a full-scale IQ (FSIQ), depending on needs (Maccow, 2011). In this study, only the non-verbal part was used as verbal ability was measured by the other two tests (TROG and BPVS).

Non-verbal intelligence is measured using the Matrices sub-test, which measures ability of the participant to solve new problems that they may not have encountered before nor been trained or taught to solve. The sub-test consists of 46 items and requires the participant to identify the relationship or the pattern in a group of pictures by choosing the missing picture, from multiple choices, that fits the relationship (either verbally or by pointing). The participant is asked to identify the relationship in different visual stimuli, some of which are meaningful, such as pictures of people and objects, and some of which are abstract, such as designs and symbols. The participant must establish a hypothesis about the relationship among the visual stimuli and test their hypothesis to solve the problem (Maccow, 2011).

3.3.6 Participant matching

The two adolescent groups (ASD and TD) were matched, as much as possible, in terms of their background characteristics. Participant matching was done before conducting the main study tasks in order to ensure the two groups had similar verbal and IQ levels and to rule out any possible effects these background variables had on the final results in terms of group differences. The two groups were match in their verbal ability (vocabulary and grammar) to ensure that any observed pragmatic deficits were not due to poor language skills in a particular group compared to the other group.

Comparing the performances of individuals with ASD with a control groups from the typical population and/or clinical population (e.g. Down's syndrome) is one of the most commonly used research designs in autism research (Simmons et al., 2009). Therefore, autism studies usually adopt group-matching procedures to match different populations, using a range of possible matching variables (e.g., non-verbal IQ, verbal IQ, full scales IQ, chronological age, and/or language skills) based on the main focus and aim of the research (Simmons et al., 2009; Kover & Atwood, 2013). Using this matching design allows researchers to exclude the influence of background factors that may affect participants' performance in the main experiment tasks and helps in determining the underlying and influential factors related to performance (Jarrold & Brock, 2004).

In this study, ASD and TD participants were equivalent in gender (10 male and 5 female in each group); native language (Arabic); and culture (Arab). They were also matched in terms of their verbal ability. Each participant in the ASD group was matched to an individual in the TD group who scored within -/+ 2 points in the raw scores for TROG and -/+ 2 points in the raw scores for BPVS. Language and IQ tests were applied first on a group of adolescents with ASD (who agreed to participate in the study). At this stage, three participants with ASD were excluded from the study. One participant withdrew from the language test and two participants scored below the average range in the non-verbal IQ test. After identifying participants with ASD, the language and IQ tests were administered to TD adolescents who met the age, culture and gender criteria. After scoring the tests, five TD participants were excluded from the study because there were no suitable matches for them in the ASD group. These participants were replaced by five other TD adolescents who were perfectly matched.

Independent sample *t*-tests were used to compare the two groups on raw scores on the TROG and BPVS and on standardised scores on the KIBIT. Results show that the two groups did not differ statistically in receptive grammar [TROG, t (28) = –0.940, p = .355], and receptive vocabulary [BPVS, t (28) = 0.069, p = .946]. The two groups differed in terms of non-verbal IQ [t (28) = –4.977, p= .001]. The TD group scored slightly, but significantly, higher IQ scores than the ASD group (100 as opposed to 94; See Table 3.1). However, to mitigate this difference, a specific statistical test was used (analysis of covariance) to ensure that it did not affect the final results of the group comparison.

Table 3.1: *Background characteristics of participant groups*

	Group				
	ASD (n=15)	TD (n=15)	F	df	p
	M (SD)	M (SD)			
Age (in months)	173.89 (19.10)	150.73 (22.01)			
Non-verbal IQ (KBIT)†	94.00 (4.47)	100.27 (1.94)	3.75	28	.001
BPVS	145.53 (5.26)	145.40 (5.35)	0.01	28	.946
TROG	16.40 (0.98)	16.80 (1.32)	0.82	28	.355

Note: ASD = autism spectrum disorder; TD = typically developing; M = mean, SD = standard deviation; KBIT = Kaufman Brief Intelligence Test; BPVS = British Picture Vocabulary Scales; TROG = Test for the Reception of Grammar

† The average range as measured by the KBIT is 85–104.

3.4 Data Collection

The tools used to gather data in this research consist of three different qualitative and quantitative instruments. These were selected in order to investigate all aspects of the pragmatic and conversational features of adolescents with ASD. These instruments are: a semi-structured conversation (Yale *in vivo* Pragmatic Protocol, Simmons et al., 2014), a caregiver questionnaire (Pragmatics Profile of Everyday Communication Skills, Dewart and Summers, 1996) and discourse analysis of informal conversation samples.

3.4.1 Semi-structured conversations: The Yale *in vivo* Pragmatic Protocol (YiPP)

As pragmatics is closely related to context (Adams, 2002; Volden et al., 2009), it is difficult to measure and analyse pragmatic competence within a standardised situation only. A standardised test may not reveal the participants' overall pragmatic competence. However, pragmatic issues may be better detected in narratives and conversations that require the constant exchange of information between the participants, as it occurs in real-life situations. Dynamic assessment is ideal for testing pragmatic and conversational competence. In dynamic assessment it is possible to observe natural discourse in context and a wide variety of conversational behaviours (Simmons et al., 2014).

Simmons et al., (2014) proposed a method of testing pragmatic skills by using a combination of static and dynamic assessment procedures. Their pragmatic protocol, called the Yale *in-vivo* Pragmatic Protocol (YiPP), was used to examine differences in the responses of two groups of school-aged children and teenagers with ASD. YiPP entails a semi-structured conversational task, where specific pragmatic questions are adapted based on the participant's performance and the examiner's feedback. The protocol was designed to allow variations in the degree of support provided for completion of each task and the amount of contextual structure provided, so the participants' optimal level of achievement could be observed. Further, the dynamic assessment can include instruction and feedback within the testing process, which can specifically target the participant's performance. This type of assessment is particularly valuable for evaluating growth over time or within a treatment programme. YiPP's strength is in its ability to control for pragmatic behaviours by fabricating a social situation in which communication breakdowns occur in a manner similar to natural, real-life contexts (Simmons et al., 2014).

In this study, a translated and adapted version of YiPP (Simmons et al., 2014) was used. The instrument includes a set of probes designed to gather information on different conversational behaviours and test the participants' conversational abilities in four conversational areas: discourse management, communicative functions, conversational repair, and presupposition. Following a script targeting a 30-minute conversation, the protocol was designed to seem as natural as possible to the participants, by including tasks and activities they encounter on a daily basis. The examiner inserted 19 pragmatic probes into this script, each of which was designed to stimulate a certain pragmatic behaviour and to elicit targeted behaviours in the four conversational domains listed above (See Appendix 7).

Each of the four main pragmatic domains in the YiPP includes a number of related pragmatic behaviours. First, the discourse management domain targets six pragmatic behaviours, *topic initiation, topic maintenance, topic termination, turn-taking, request information,* and *providing background information*. The communicative functions domain measures the abilities of *hypothesizing, commenting, requesting, and protesting*. The third domain, conversational repair, assesses the participant's ability to request clarification after *muffled speech, decreased volume, unfamiliar acronyms,* and *ambiguous statements*. Finally, the presupposition domain assesses five pragmatic behaviours associated with this skill,

comment contingently, ambiguous articles, ambiguous pronouns, too little verbal information, and *too little written information.*

A probe in the protocol to trigger pragmatic behaviours could entail, for example, asking the participant a question at the beginning of the conversation, such as *"What would you like to talk about?"* to measure their ability to initiate a conversation. The probe in YiPP is as follows:

"E says "Ok, let's begin. What would you like to talk about?" Wait to see if P initiates topic (Initiation). If P talks about interest or hobby or any other topic, move to Behaviour 2. If not, cue* and begin conversation about hobbies." (Simmons et al., 2014, p. 2)

"يقول الممتحن " حسنا دعنا نبدأ، ما الذي تود التحدث بشأنه؟" انتظر لترى ما إذا كان المشارك يبدأ الموضوع (البدء). إذا بدء المشارك في التحدث عن الاهتمامات او الهوايات او اي موضوع اخر، انتقل الى السلوك رقم ٢. إذا لم يكن الامر كذلك فقم بإعطاء التلميحات* وابدأ بالمحادثة عن الهوايات"

Another probe example, in the communicative functions domain, is giving participants a questionnaire to complete at the end of the conversation protocol without giving them a pen to trigger their ability to request an object (See Appendix 7). An example of this probe in the YiPP is as follows:

"E hands questionnaire to P and asks P to complete it.
Don't give pencil (This gives P the opportunity to request one). (Request Object)*"
(Simmons et al., 2014, p. 3)

"يسلم الممتحن الاستبيان للمشارك ويطلب منه إكماله.
لا تعطه قلم رصاص لتعبئة الاستبيان (يعطي ذلك فرصة للمشارك لطلب قلم رصاص). (طلب شيء ما*)"

After the participant and the examiner were seated across from each other, the examiner began the conversation and introduced the probes naturally. When the required answer was produced, the examiner continued to the next step in the conversation. If the participant did not respond to the probe, the examiner offered cues or prompts to elicit the targeted pragmatic behaviour. The examiner began by offering the lowest level of support and more supportive cues were given only if the participant failed to respond to the previous cue. This was done until the participant produced the targeted pragmatic behaviour or until

the last cue was given. The cues were provided in the following order: expectant waiting, gesture or facial expression, non-specific verbal cue or repetition of pragmatic probe, and, finally, a specific verbal cue (See Appendix 7).

The participants' responses to each pragmatic probe were recorded as error scores and as cue scores. The error scores indicated whether or not the participant's answers to the probes were appropriate. Error scores range from zero to two. Each score on the scale is equal to the degree of appropriateness of different pragmatic behaviours; zero indicates that the answer provided was compatible with the desired response. One suggests that the answer was somewhat inappropriate, while two means that the answer was not suitable or cannot be considered a response. The cue scores indicated the extent to which the examiner provided cues when the participant's answer was wrong, or when they did not provide an answer. These scores range from zero to six. The lowest score on this scale (zero) means that the participant did not give an answer despite the hints provided. The highest score (six) indicates that the participant responded appropriately without any help or hints. Obtaining a high error score indicates a weak performance, while a high cue score is evidence of an appropriate performance (See Table 3.2. YiPP coding scheme).

The participants' conversations were audio recorded and later scored and analysed because it was difficult to conduct the testing and grading at the same time. However, some notes were taken during the conversations with the participants, especially when presenting the non-verbal cues, as permission to use video recording was not granted. More details about the coding process are presented in Section 3.5 on data analysis.

Table 3.2: *YiPP coding scheme*

	Description
Error score	
2	Incorrect/no response
1	Mildly inappropriate, unusual response
0	Correct/appropriate response
Cue score	
6	Appropriate, spontaneous response
5	Mildly inappropriate response
4	Expectant waiting
3	Gesture/facial expression
2	Nonspecific verbal cue/repetition
1	Specific verbal cue
0	No response to any prompt

Note: Error and cue score hierarchy adapted from Simmons et al., 2014.

3.4.2 Caregiver questionnaire: Modified Pragmatics Profile of Everyday Communication Skills in Adults (PPECS)

Communication is a dynamic process in which people's use of language is influenced by other people, places, and activities, making it difficult to investigate in context-free situations, such as standardised tests. Dewart and Summers (1996) developed the Pragmatics Profile of Everyday Communication Skills in Adults (PPECS) to identify aspects of people's communication abilities in everyday life. According to Dewart and Summers (1996), in order to gain a full picture of the language and pragmatic performance of a person, insight into their communication in everyday life situations, in naturalistic settings, should be gained to complement their assessment in clinical settings using standardised tests.

The PPECS has the form of a semi-structured interview guide, suitable for exploring the pragmatic aspects of most people, as the different questions are appropriate for people with and without communication deficits. It is also appropriate for the vast majority of ages, including children, adolescents, adults, and elderly people. Furthermore, this tool provides more information about participants' behaviours, during conversations and interactions with

others, and clarifies their strengths and weaknesses from another person's perspective. The PPECS has been used in a number of studies to investigate communication and pragmatics in a wide range of people, including children with Down's syndrome (Johnston & Stansfield, 1997); children with autism and epilepsy (Parkinson, 2006); children with William syndrome (Stojanovik & James, 2006); and deaf children (Mouvet et al., 2013).

In this study, I modified and translated the PPECS (Dewart & Summers, 1996) to create a questionnaire to elicit the caregivers' perspectives on their children's communication and pragmatic language abilities in everyday life outside the clinical environment. The original PPECS was converted into a questionnaire for two reasons. First, the questionnaire format allowed for a quantitative examination of the pragmatic difficulties of the participants based on their caregivers' perceptions, while the YiPP quantified the participants' pragmatic difficulties based on their own performance, providing two perspective of the research focus. Second, qualitative data require more time and effort to analyse, time better spent on analysing the participants' own conversations qualitatively, using discourse analysis techniques.

The original PPECS consists of 28 questions, divided into four main categories: (1) communicative functions; (2) response to communication; (3) interaction and conversation; and (4) contextual variation. The modified PPECS includes 22 questions, divided into two categories: communicative functions, and interaction and conversation. These two categories focus on similar pragmatic behaviours as the YiPP, providing two different perspectives on these behaviors. (See Appendix 8)

The first pragmatic domain, communicative functions, investigates the communicative acts people tend to use in their daily life, such as requesting, rejecting, attention directing, and expressing feelings. Different questions are asked to assess these abilities. For example, to assess requesting ability, the caregiver was asked "*If [name] needs help with something they are doing, how do they usually let you know?*" and to choose the most common behaviour that their child routinely used, such as

- *Asks for help and explains what is needed*
- *Hints (says something like "This is heavy")*
- *Comes up to me and shows what is needed*
- *Calls out but does not explain the problem*

- *Gets angry and distressed without asking for help*

- *Just waits*

(Dewart and Summers, 1996, p. 2)

إذا كان (الاسم) بحاجة إلى المساعدة فيما يقوم به فكيف يخبرك بذلك عادة؟

- يطلب المساعدة ويوضح ما يحتاج إليه

- يلمح (يقول شيئا مثل "هذا ثقيل")

- يقترب منك ويريك ما يحتاج إليه

- ينادي ولكن دون توضيح المشكلة

- يغضب وينزعج دون ان يطلب المساعدة

- ينتظر فحسب

The second pragmatic domain, interaction and conversation, assesses how people interact and participate in conversations with other people. Questions in this section focus on the basic conversational skills people need to conduct a successful conversation, including the ability to initiate, maintain, and terminate conversations; turn-taking, presupposition, and conversational repair. For example, a question to assess conversation initiation ability asks caregivers "*When [name] wants to start up a conversation with someone, what do they generally do?*" Potential responses include:

- *Makes eye contact*

- *Asks how they are*

- *Comments on something like the weather*

- *Asks their opinion on something*

- *Asks a personal question*

- *Launches into a topic*

- *Doesn't start up a conversation*

(Dewart and Summers, 1996, p. 7)

- عندما يريد (الاسم) أن يفتح حوارا مع أحدهم، فما الذي يفعله عادة؟

- يتواصل بالعين

- يسأله عن حاله

- يعلق على شيء مثل الطقس

- يسأله عن رأيه حول موضوع ما

- يطرح أسئلة شخصية
- يدخل في الموضوع
- لا يبدأ المحادثة

The multiple-choice response options that follow each of the 22 questions match a range of developmental levels, with the most typical behaviour at the top and the least typical at the bottom. Caregivers were asked to choose their child's most common behaviour in response to different situations. Higher scores are a sign of atypical behaviour and greater difficulties and lower scores are the opposite. The maximum score is 100%. The answers were marked on the questionnaire form (See Section 3.5 for more detail about the coding procedures). Once completed, questionnaires were statistically analysed to identify the main pragmatic features that emerged from the collected data.

The YiPP and PPECS data collection tools focus on similar pragmatic behaviours using different classifications. Both tools were chosen to measure the same pragmatic areas from two different viewpoints, the participants' performances and their caregivers' perceptions. For example, the interaction and conversation domain in the PPECS corresponds to pragmatic abilities in the YiPP, including conversation repair, presupposition, and some discourse management abilities, such as initiation, maintaining an interaction, joining a conversation (turn-taking), and terminating a conversation. Description of the pragmatic behaviours in the YiPP and the PPECS are presented in Table 3.3.

Table 3.3: *Description of pragmatic behaviours in the YiPP and the PPECS*

Pragmatic behaviours	Data collection tool	Definition/ description
Turn-taking/ joining a conversation	YiPP + PPECS	Ability to initiate and shift in turns during conversational exchange where one participant acts and communicates in conversation, then stops and gives the floor to other interlocutors to act and communicate.

Topic initiation	YiPP + PPECS	Ability to start conversation in an appropriate way by drawing the attention of the listener in different ways, such as greeting and eye contact.
Topic maintenance	YiPP + PPECS	Ability to sustain conversation by expanding the topic in the conversation and adding sufficient and relevant information.
Topic termination	YiPP + PPECS	Ability to end a conversation appropriately by recognising different cues from other interlocutors.
Request information	YiPP + PPECS	Ability to ask the listener to provide additional information about the conversation topic.
Request object /assistance	YiPP + PPECS	Ability to make requests to attain specific goals, such as getting a specific object or action.
Refusal /denial	YiPP + PPECS	Ability to verbally deny and reject a specific object, action, or activity.
Presupposition	YiPP + PPECS	Identifying the needs of other conversational participants by predicting both what listeners already know and what they wish to know.
Conversational repair / request clarification	YiPP + PPECS	Ability to clarify the intended message in a conversation if a communication breakdown occurs and the ability to ask for clarification following the occurrence of a breakdown.
Providing background information	YiPP	Ability to make relevant remarks in a conversation and provide an appropriate amount of information as required by the discourse topic and the listener.
Commenting	YiPP	Ability to share information and remarks with others and provide comments related to the conversation topic.

Hypothesising	YiPP	Ability to give an explanation or express an assumption about certain issues.
Direct attention	PPECS	Ability to draw and attract others' attention to self or to other people, objects, or activities.
Self-assertion	PPECS	Ability to assert oneself in different ways such as introducing oneself to others, interacting with other people, and doing things without asking for help or refusing help if it has been offered.
Giving information	PPECS	Ability to give information about new events, about being unwell or uncomfortable.
Narrative	PPECS	Ability to comprehend and produce a story, joke, and experience in a coherent way.
Compliance with social conventions	PPECS	Ability to comply with social rules and to take account of the behaviours of others and recognise the level of formality.
Express emotions	PPECS	Ability to tell others how they feel and verbally express different emotions, such as being happy or upset.

3.4.3 Translation of data collection tools

The tools used in this research were adapted and translated from English into Arabic to ensure reliability and clarity and to guarantee that they achieve their intended purpose. I used back translation, a common and recommended method of translation, to increase the accuracy of the translation. In back translation a document is translated from the source language to the target language and then back to the source language. The different versions in the source language are then compared to evaluate and modify the final target language version (Bernard, 2017). Using this method, I checked the accuracy of the translated tools, their meaning, content, format, and instructions, while taking into consideration changes made to adapt the tools to the nature of target language and its culture.

In this study, I translated the instruments used from English into Arabic, as I am a native Arabic speaker, with sufficient fluency in English and familiarity with the research

topic. The translated tools in Arabic were then given to three Arabic-English bilingual speakers to independently translate the tools back into English. A comparison between the two versions was subsequently made to clarify issues and remove ambiguities in the Arabic version and an Arabic language version was reached for each tool. Finally, this Arabic version was sent to a well-known Arabic teacher in this field, who reviewed the tools, edited mistakes, checked spelling and grammar, and created a final version of the instruments.

3.4.4 Pilot study

A pilot study was conducted to test the translated tools used in this research: TROG (Bishop, 2003); BPVS (Dunn & Dunn, 2009); PPECS (Dewart & Summers, 1996); and YiPP (Simmons et al., 2014). Piloting the tools was an important step before conducting the study and collecting the main research data. The pilot study provided feedback about the tools' format and content and informed the adaptation and refining of the tools for the intended participants, by reducing the ambiguity and providing appropriate wording (Hassan et al., 2006).

Pilot testing of the caregivers' questionnaire (PPECS) was carried out in Saudi Arabia, with six caregivers of adolescents with ASD and TD (not included in the main study sample). This pilot tested the usability of the changed format of the original PPECS from a semi-structured interview guide to a questionnaire. It also examined the comprehensiveness and clarity of the multiple-choice response options in the modified questionnaire, which were adapted from examples of various possible pragmatic behaviours that appear under each question in the original PPECS. Based on results of this pilot, the number of pragmatic domains included was reduced from four (communicative functions; response to communication; interaction and conversation; and contextual variation) to two (communicative functions and interaction and conversation). Thus, the number of questions was reduced from 28 to 22 as these two domains cover the main pragmatic areas under investigation in this research.

Pilot testing the semi-structured conversation tool, YiPP, was carried out in the United Kingdom (UK) with three Saudi students (not included in the main study sample), who studied in the UK and shared the same language and culture as the main study participants. This pilot study examined the clarity and suitability of the Arabic version of the YiPP and the changes made to the topics in the YiPP to adapt it to the study sample and the

environment in which the participants live. For example, the subject of the conversation was changed from a comparison between the participants' and the examiner's hometowns, to a comparison between their schools. Certain phrases were also changed to suit the new conversation topic. For example, the phrase "*I'd like to know how the town you live in is different from the one I live in*" was changed to "*I'd like to know how the school you study in is different from the one I study in*". "*I have a CSP in my town*" was changed to "*I have a LAB in my school*"; the examiner then explained that LAB stands for laboratory. Similar changes were made to other phrases.

Cross-cultural adaptation is important when using a tool in new cultural and linguistic settings than the original to avoid misinterpretation and ensure the clarity and suitability of the tool to the study and its participants (Gjersing et al., 2010). In this study, the YiPP was adapted to the study's culture (Arab) from where it was originally published and tested (Western culture) to avoid cultural variation and bias. For example, some of the topics of the conversations in the original protocol were changed to better suit the participants. Topics related to differences between cities were changed to topics related to schools, as explained above. The reason for this change was that in the Saudi context, it is not common for people to live away from their hometown or travel a lot between cities. Thus, I did not expect that talking about different cities would trigger the participants to talk and provide more information. In addition, some parents of individuals with special needs in Saudi Arabia, including those with ASD, are more likely to avoid having their children socialise with others to avoid harsh judgment due to lack of public awareness (Mashat et al., 2014; Alsehemi et al., 2017). Therefore, schools are the most familiar places for adolescents with ASD outside their homes, where they have friends and more social interaction; this makes talking about schools and their daily life in the schools more fruitful and realistic for them.

Finally, the questionnaire and the semi-structured conversations (PPECS and YiPP) were revised and modified after translation and piloting. The final versions of these tools were issued before collecting the main research data.

3.4.5 Conversation / language samples: discourse analysis

Discourse analysis is the linguistic examination of the language produced naturally through conversation or written texts. Studies using discourse analysis techniques deal with spoken or written discourse as a social practice and interaction (Wood & Kroger, 2000).

Discourse analysis studies language beyond the sentence level and examines it in terms of its use in society and its communicative functions between speakers. In this approach, language is considered an action, and the function of discourse analysis is to investigate what speakers do with language and the effect of this action on listeners (Hall et al., 2006). This method is widely used in linguistics to examine the social and functional aspects of real speech as it occurs in a natural context and in analysing the speech of people with language and communication difficulties (Kremer-Sadlik, 2004; Ochs & Solomon, 2004).

In this study, I used informal conversation samples to conduct a discourse analysis of the participants' common pragmatic problems and to look at what they actually do when they converse. The discourse analysis was used in order to provide detailed insights and information about the pragmatic functioning of the adolescents with ASD. In spite of the importance of quantitative evidence in providing numeric and more objective data, which increases the reliability of a study's results, these data could not give deep and sufficient descriptions of the actual pragmatic performance of the participants because the different pragmatic skills were only reported as present or absent. In contrast, the qualitative analysis of the participant's conversation samples provided additional information and more realistic insights, such as individual variation in pragmatic performance between different participants within the group with ASD, that could not be captured from the quantitative analysis alone using YiPP and PPECS. It was also beneficial in highlighting the actual contextualised pragmatic skills of the participants in dynamic and ever-changing communication contexts, such as in real life communication where participants interacted in novel contexts outside their daily routine with unfamiliar persons who did not compensate for their social language weakness. Therefore, combining these two approaches (quantitative and qualitative methods) helps overcome the weaknesses of these two methods when used separately, increases the quality, quantity and validity of the collected data and provides a more comprehensive understanding of the investigated subject by gaining both numeric data from the quantitative measures as well as contextual understanding from the qualitative data.

I collected natural language samples from all participants with ASD during a 15 minutes warm-up conversation before starting the YiPP semi-structured conversation protocol. We talked about general topics, such as daily routines, friendship, hobbies, and school. In cases that the participants did not say much, I asked them follow-up questions to encourage them to talk more. These audio conversations were recorded and then transcribed using Jefferson's

(1984) transcription conventions. The transcriptions were first done by me and then checked by another independent transcriber to ensure reliability; adjustments were made when necessary.

3.4.6   Data collection procedures

The fieldwork of this study was carried out in a series of sessions but before that teachers of participants with ASD, notified them in advance about the tests and they were told that the researcher would conduct a simple conversation with them and they would be asked about some pictures and words. This step was necessary, because some people with ASD have problems coping with sudden change in their daily routines and schedules. I also visited these participants informally to become more familiar with them before beginning the tests.

After receiving the necessary permissions and consent, I administered the tests required for participant selection and matching (See Sections 3.3.4 and 3.3.6). Selected participants were then invited to participate in a 45-minute data collection session. At these sessions, I first conducted a 15-minute warm-up conversation with the participants to give them a sense of comfort and familiarity with me and to record a language sample for the discourse analysis. I then gradually moved on to the YiPP conversation, so it would seem natural to the participants. The YiPP protocol lasted approximately 20–30 minutes. All conversations were audio-recorded and later transcribed. During the sessions, parents and caregivers were asked to complete the modified PPECS questionnaire, which took about 10–15 minutes to complete.

To ensure participants' concentration and confidentiality, data collection took place in a quiet room with comfortable chairs and a table. Anything that could cause distraction was removed. However, the YiPP protocol requires some environmental arrangements, including specific tools in the room to trigger pragmatic behaviours, which may not occur otherwise. These tools include bells inside a box, two magazines, and a voice recorder. For example, I used the two magazines to trigger rejection or refusal by offering the magazines to participants and giving them the wrong magazine to see whether they would reject or accept it. In another example, I pretended that there was a problem with the voice recorder (it was without batteries), and I tried to fix it to see if the participants would help me by hypothesising about the possible causes of the malfunction.

3.5. Data Analysis

All quantitative data were analysed using Statistical Package for the Social Sciences (SPSS), version 23.0. To investigate group differences in the data collected using the YiPP and PPECS questionnaire, analysis of covariance (ANCOVA) and multivariate analysis of covariance (MANCOVA) were used. Follow-up univariate analyses of covariance for each item in the main tools were also conducted to identify items where the groups differed. Since participants differed on their IQ scores, IQ was added to the models as a covariate to ensure that any differences between the groups in the final results were not due to differences in this background factor. Bonferroni correction was used to correct for multiple testing.

In coding the YiPP, after collecting the required data and referring to the recordings and my notes, I recorded the error scores (i.e. the degree of appropriateness of different pragmatic behaviours) and cue scores (i.e. the extent to which the examiner provided participants with cues) for each pragmatic behaviour (probe) in the Coding Rubric-Form C attached to the protocol for each participant (See Appendix 7). I then calculated the mean error scores and mean cue scores of the different probes within each domain for each participant in both groups to allow comparison of the two groups (using ANCOVA) in the four main domains: Discourse management (6 probes); communicative functions (4 probes); conversational repair (4 probes); and presupposition (5 probes). Finally, to compare the participants' performances in each of the 19 pragmatic probes, I calculated (using MANCOV) the average scores across the group with ASD (n=15) for each probe (e.g., topic initiation, turn-taking, requesting) and then compared them to the average scores of the TD group (n=15) in each probe.

To code the caregivers' responses to the questionnaire (PPECS), in both groups, I recorded each caregiver's response (option from multiple choices that match a range of developmental levels) to each question (item) on the different pragmatic behaviours. Since the number of answer choices for each question was different, for example, there were seven possible answers to the question on requesting behaviour and eight choices on refusing behaviour, I turned the different responses into percentages. Then, for each caregiver rating in both groups, I calculated the mean scores of the different items within each main domain (communicative functions=11 items and interaction and conversation=11 items) to allow a comparison of the two groups (using ANCOVA) in these two main domains. Finally, to compare the caregivers' ratings in the 22 pragmatic items (using MANCOV), I calculated the

average scores across the group with ASD (n=15) for each item (e.g., attention directing, topic maintenance, requesting) and then compared them to the average scores of TD group (n=15).

Discourse analysis was used to examine participants' actual discourse in the language samples. After the data were collected, the audio recordings were transcribed. Then, after listening to the recordings and reading the transcriptions carefully, some pragmatic issues were identified among the participants. However, no common style of speech was found in the conversations of participants with ASD in this study; instead, we observed a variety of varying degrees of conversational difficulties. Therefore, in coding the conversation samples, a more descriptive level of analysis was performed where the most noticeable pragmatic difficulties that affected the flow of conversation with the participants were identified. These issues were then grouped and classified in light of Damico's clinical discourse analysis procedure (1985). According to Damico (1985), clinical discourse analysis is "a conversational sampling procedure oriented towards functional aspects of social action at the descriptive level of analysis". In his procedure, Damico adapted Grice's cooperative principle and its maxims as a theoretical framework to organize and describe different problematic behaviours in discourse. Using Grice's maxims in analysing discourse in clinical language sampling is beneficial as it can be easily adapted for describing and analysing problematic language behaviours where "they were designed to account for underlying conditions of discourse irrespective of the intentionality" (Damico, 1985. P.174).

Thus, in this study different pragmatic difficulties found in the conversations of the participants were grouped and explained using Grice's cooperative principle and three associated maxims (quantity, relation, manner), which are presented in more detail in Chapter Two. Further classifications under each main maxim as well as categorisations of different pragmatic skills were adapted from Damico (1985) and Bishop and Adams (1989). The different categories adopted from Damico's classification used in this study are:

- *needing repetition*
- *poor topic maintenance*
- *inappropriate response*
- *linguistic non-fluency*
- *failure to structure discourse*

- *turn-taking difficulty*

Additionally, other categories including *offering too much information*, *offering too little information*, and *failure to comprehend literal meaning* were added from Bishop and Adams' (1998) classification. Finally, other problems in the participants' conversations, not classified under the previous classifications, were analysed and classified based on the different pragmatic difficulties discussed in the literature on autism. More details, definitions, and examples of the different pragmatic categories used in the discourse analysis are presented and discussed in Chapter Four.

As the conversation samples were collected in the participants' native language (Arabic), some examples were translated to English (the language of this dissertation) and included in the results and discussion chapters to explain and clarify the participants' pragmatic performance in a natural verbal interaction. In translating these examples, I listened to the recordings many times before transcribing them and then carefully translated them to ensure accuracy and a reliable representation of the participants' real language. In the transcription process and the different examples presented in this study, anonymity and privacy were given special attention to protect participants' identities and any personal information related to them.

3.6 Ethical Considerations

Permissions were obtained from the special-needs centres in Saudi Arabia to conduct the study at their centres and with their students (See Appendix 5-6). Initial permissions from parents of ASD and TD adolescents for their children's participation in the study were also obtained. Upon receiving permissions, ethical approval was provided by Bangor University, College of Arts and Humanities research ethics committee in the United Kingdom (See Appendix 4).

All participants received an information sheet that explained the study and emphasized that participation was completely voluntary. It informed participants of their right to withdraw from the study at any time and request their data be removed from the study. It also indicated that their identities would remain anonymous and their privacy guaranteed. All caregivers signed a consent form for the participation of their children and / or their own participation. The collected data is confidential and is stored appropriately. It has been and

will only be used for the purposes of this study. Participants were provided with my contact information and were welcome to contact me at any time to ask about any aspect of the project. Special care and careful consideration were given in dealing with the adolescents with ASD, as they are a very sensitive population, to ensure that they did not experience any discomfort from their involvement in the study.

3.7 Validity and Reliability

The validity and reliability of the translated YiPP and the modified and translated PPECS questionnaire (both quantitative tools) was not examined in this study, as the measures were used for the purpose of exploring the pragmatic difficulties among individuals with ASD and not for diagnosis and treatment plans. However, the YiPP in its original format has a high degree of reliability and moderate validity (Simmons et al., 2014). Furthermore, collecting data from different sources, using different tools, and both quantitative and qualitative data analysis methods contribute to the validity of research findings. Common themes derived from data collected using different sources and tools increases the validity and reliability of the study (Creswell & Miller, 2000).

3.8 Summary

In this chapter, the methodology used in this study was outlined and discussed in detail. To overcome the methodological limitations of previous research on the pragmatic skills of individuals with ASD, which used either direct or indirect measures, I used an integrated approach to investigate the participants' pragmatic abilities by focusing on their performances and their caregivers' perceptions of their abilities. In this study, I adopted a mixed methods approach, using both quantitative and qualitative methods to obtain as full picture and a deeper understanding of the participants' pragmatic and conversational skills. Moreover, by translating and adapting the data collection tools to the Arabic language, this study contributes to addressing the lack of tools available in Arabic for assessing the abilities of Arabic-speaking people with ASD. Results obtained from using these different tools and methods are presented in the next chapter.

Chapter Four: Results

4.1 Introduction

The purpose of this study was to identify the pragmatic and conversational skills of adolescents with autism spectrum disorder (ASD) as compared to typically developing (TD) adolescents. The results of the analyses provide responses to each of the research questions posed in this study:

1. What are the differences between the conversational skills of Saudi-Arabian adolescents with ASD and TD adolescents in terms of their discourse management ability? communicative function ability? conversational repair ability? presupposition ability? other pragmatic abilities?

2. What are the differences between the conversational skills of Saudi-Arabian adolescents with ASD and TD adolescents based in their caregivers' perspectives in terms of the above-mentioned abilities?

3. What are the similarities and differences between the perceptions of the caregivers and the observed strengths and weaknesses of the ASD participants' pragmatic and conversational abilities?

The first and second research questions focus on investigating the differences between the two groups in their conversational skills based on their actual performance in Yale *in vivo* Pragmatic Protocol (YiPP) and based on the perceptions of their caregivers in their responses to the modified Pragmatics Profile of Everyday Communication Skills in Adults (PPECS) questionnaire. The third research question considers the similarities and differences between the two sources of information in the assessment of the participants' pragmatic and conversational abilities.

This chapter is divided into two sections, comprising quantitative and qualitative results. The first section presents a statistical comparison of the participants' performances in semi-structured conversations, using the YiPP, and an analysis of the caregivers' perceptions, gathered using the modified PPECS questionnaire. Similarities and differences between the perceptions of the caregivers and the participants' performances, in terms of the pragmatic behaviours common to both tools, are also presented in this section. The second section of

this chapter presents the results of the discourse analysis of the participants' conversation/language samples, which also measured their conversational skills based on their performance.

4.2 Quantitative Results

The data from the YiPP and the modified PPECS questionnaire were quantitatively analysed on two levels. First, data pertaining to the main pragmatic domains of each tool were analysed, including the four domains of the YiPP (i.e., discourse management, communicative functions, conversational repair, and presupposition) and two main domains of the PPECS (i.e., communicative functions and, conversation and interaction). Statistically significant differences were found between adolescents with ASD and TD adolescents in all main four pragmatic domains of the YiPP and the two domains of the PPECS. TD adolescents performed better than adolescents with ASD in these domains and were similarly rated by their caregivers.

At the second level of analysis, the items within the pragmatic domains of the YiPP and PPECS were analysed. Each broad pragmatic domain is associated with a number of pragmatic behaviours. A close analysis of these different behaviours revealed further differences between the adolescent groups (ASD and TD). Despite the significant differences between the two groups at the pragmatic domain level, closer inspection and analysis of the items within each domain revealed differences in some items but not in others; the pragmatic difficulties of adolescents with ASD were not found across all items. The results of the two levels of the analysis are discussed in detail in the next paragraphs.

ANCOVA was performed to check for gender differences in each adolescent group (ASD and TD). As no significant differences were found between male and female participants in either group, nor in the pragmatic domains of the PPECS and the YiPP, female and male results were combined.

4.2.1 Results in the four main pragmatic domains of the YiPP

The participants' responses to each pragmatic probe during the semi-structured interviews were assessed using *error scores* and *cue scores*. *Error scores* (0–2) indicate the degree of appropriateness of the participants' pragmatic behaviours in response to the probes:

Zero indicates that the response was appropriate, 1 suggests that the response was somewhat inappropriate, and 2 means that the response was not suitable or cannot be considered a response. *Cue scores* (0–6) determine the extent to which the examiner provided participants with cues when their answers were wrong: Zero, the lowest score, means that the participant did not respond appropriately in spite of the hints they received; 6, the highest score, indicates that the participant responded in an appropriate manner without any help or hints (See Chapter Three for more information about the YiPP scoring method).

Adolescents with ASD showed an overall deficit across the four main pragmatic domains of the YiPP (i.e., discourse management, communicative functions, conversational repair, and presupposition), as assessed in their performance during the semi-structured conversations; this deficit was not found in the conversations of the TD adolescents. The TD group had lower-mean error scores, as they committed less errors, compared to the ASD group, who had higher-mean error scores, as they committed more errors in response to the different pragmatic behaviour probes. (See Table 4.1)

Adolescents with ASD also needed more cues to trigger the target pragmatic behaviour than the TD adolescents. The adolescents with ASD had lower-mean cue scores, as they needed more support compared to their TD peers, who had higher-mean cue scores; and I offered the ASD group more cues, using the different cues provided in the protocol in a particular order, than the TD group. Means and standard deviations of error and cue scores in the four pragmatic domains are shown in Table 4.1.

Table 4.1: *Means and Standard Deviations of Error and Cue Scores in the Four Pragmatic Domains*

Domain	Group						
	TD (*n*=15)		ASD (*n*=15)				
	M (SD)	ADJ M (SE)	M (SD)	ADJ M (SE)	F	df	p
Error scores							
Discourse management	0.15 (0.17)	0.17 (0.04)	0.96 (0.11)	0.94 (0.04)	110.64	1	.001
Communicative functions	0.48 (0.24)	0.51 (0.08)	0.90 (0.31)	0.86 (0.08)	6.121	1	.020
Conversational repair	0.13 (0.15)	0.12 (0.05)	1.08 (0.20)	1.09 (0.05)	107.27	1	.001
Presupposition	0.33 (0.19)	0.34 (0.05)	0.94 (0.15)	0.93 (0.05)	41.99	1	.001
Cue score							
Discourse management	5.10 (0.52)	5.03 (0.13)	2.85 (0.34)	2.92 (0.13)	88.07	1	.001
Communicative functions	4.33 (0.68)	4.19 (0.24)	2.65 (0.85)	2.79 (0.24)	13.02	1	.001
Conversational repair	5.41 (0.84)	5.38 (0.22)	2.65 (0.56)	2.68 (0.22)	54.55	1	.001
Presupposition	4.73 (0.53)	4.71 (0.14)	2.48 (0.33)	2.86 (0.14)	65.78	1	.001

Note. *n*= number of participants; TD=typically developing adolescents; ASD = adolescents with autism spectrum disorder; M = mean; SD=standard deviation; ADJ M = adjusted mean; SE = standard error; *F*=ratio resulting from ANCOVA with IQ as covariate; df= degrees of freedom; p=level of significance.

ANCOVA was conducted to determine differences between participants with ASD and TD participants in terms of their conversational skills, as measured by YiPP after controlling for non-verbal IQ. Participants' performances were the dependent variable, the TD and ASD groups were the fixed factor, and participants' non-verbal IQ was the covariate.

As expected, the performance of the TD group was better than the performance of the ASD group in both error and cue scores, as evidenced by lower-mean error scores and higher-mean cue scores. After adjustment for non-verbal IQ, there was a significant difference between the two groups in their error scores. TD group performed better than the ASD group across the four pragmatic domains: discourse management, [F (1.27)=110.64, p=0.001, partial η^2=.80]; communicative functions, [F (1.27)=6.121, p=0.020, partial η^2=.18]; conversational repair, [F (1.27)=107.27, p=0.001, partial η^2=.79]; and presupposition, [F (1.27)=41.99, p=0.001, partial η^2=.60] (See Figure 4.1). In addition, there was a significant difference between the two groups in their in the cue scores. The TD group performed better than the ASD group across the four pragmatic domains: discourse management, [F (1.27)=88.07, p=0.001, partial η^2=.76]; communicative functions, [F (1.27)=13.02, p=0.001, partial η^2=.32]; conversational repair, [F (1.27)=54.55, p=0.001, partial η^2=.66]; and presupposition [F (1.27)=65.78, p=0.001, partial η^2=.70] (See Figure 4.2).
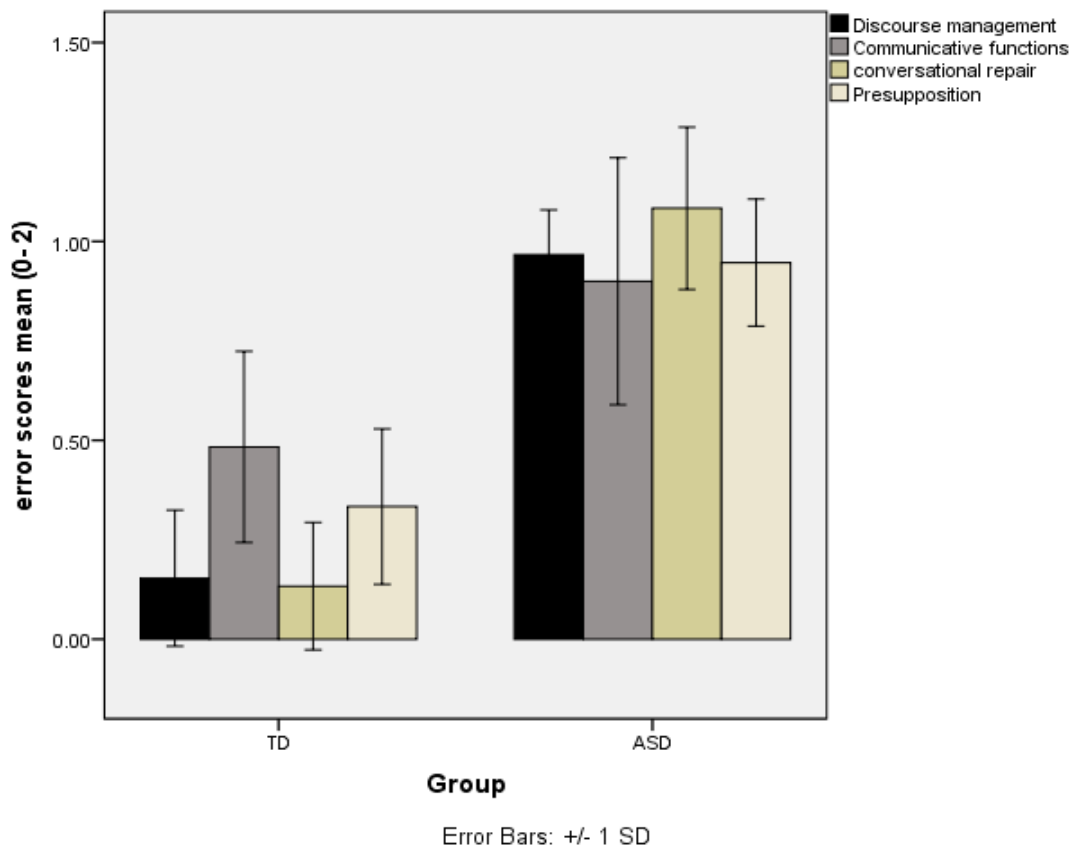
Figure 4.1. *Group differences in YiPP error scores*
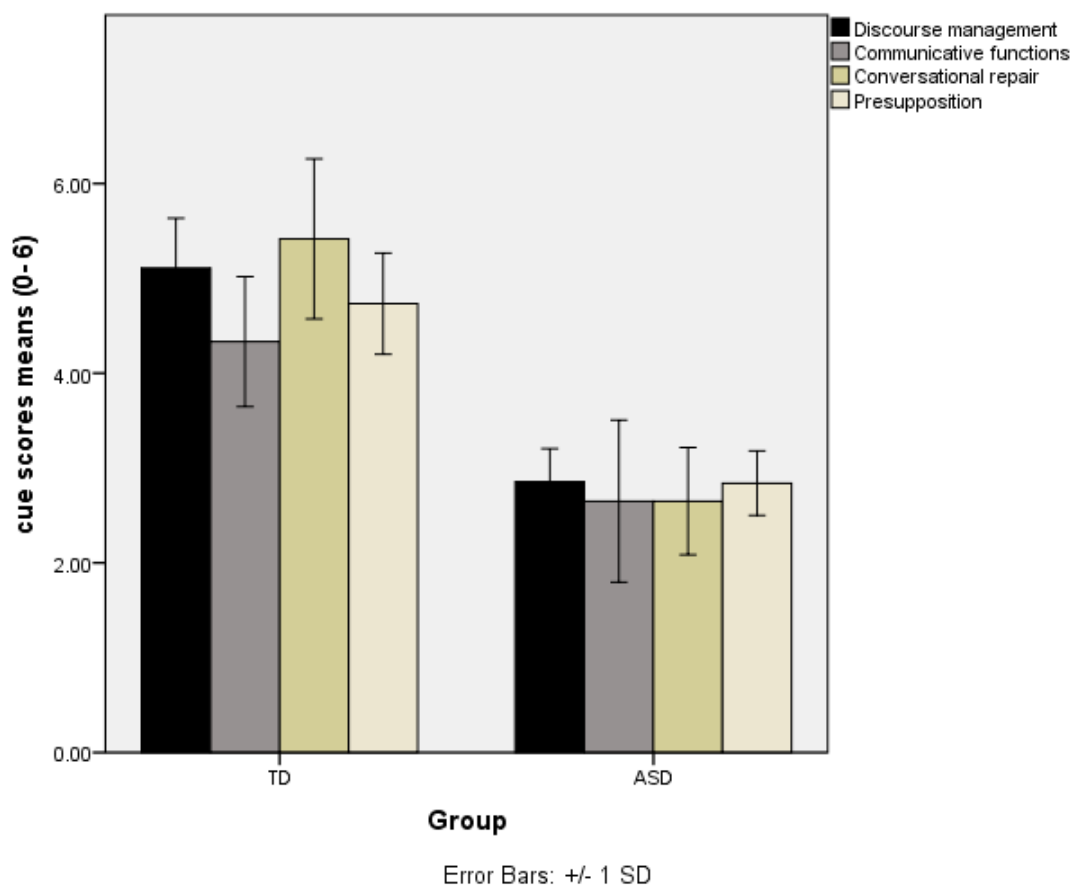
Figure 4.2. *Group differences in YiPP cue scores*

4.2.2 Results of the YiPP items analysis

In order to provide a more detailed picture of the participants' pragmatic abilities and to determine differences in responses to the YiPP probes between the ASD and TD groups, a multivariate analysis of covariance (MANCOVA) was conducted. The mean scores of the two groups for each of the 19 YiPP probes, designed to stimulate certain pragmatic behaviours, were compared. Non-verbal IQ scores were added as a covariate in the analyses.

A MANCOVA was conducted, with groups (adolescents with ASD and TD adolescents) as a fixed factor, error and cue scores of the 19 probes as dependent variables, and non-verbal IQ scores as a covariate. The analysis showed that the multivariate effects were significant for both error scores [$F_{(19.9)}=26.21$, $p=0.001$, *partial* $\eta^2=.982$] and cue

scores [F (19.9)=39.23, p=0.001, $partial \ \eta^2$=.988]. These results indicate that there was an overall significant difference between TD and ASD participants. The TD group performed better than the ASD group. Follow-up univariate analyses of covariance for each variable were also conducted to identify specific probes where the groups differed. More details about this item analysis under each main pragmatic domain are presented in the following sub-sections.

4.2.2.1 Discourse management

In this pragmatic domain (*discourse management*), in general, TD adolescents performed better than adolescents with ASD. The TD group had lower-mean error scores and higher-mean cue scores compared to the ASD group that showed higher-mean error scores and lower-mean cue scores (See Table 4.2). However, in the univariate analyses of the error scores of the 19 probes, there were further statistically significant differences between the two groups. Adolescents with ASD had difficulties in all items (*topic initiation, topic maintenance, turn-taking,* and *background information*), except *termination* and *request information,* with p-values higher than 0.05. In contrast, both groups' cue scores differed for all items. Adolescents with ASD required more cues, with all p-values < 0.05 without exception. (See Table 4.3)

4.2.2.2 Communicative functions

Despite the overall difference between the TD group and the ASD group in the main domain analysis (*communicative functions*), the univariate analyses of the error scores for each of the four items within this pragmatic domain (i.e., *hypothesising*, *commenting*, *requesting,* and *protesting*) revealed no significant differences between the two groups in all items (See Table 4.3). However, there were significant differences in the cues scores for all items except *protesting*. Adolescents with ASD required more cues than their TD counterparts to produce the appropriate pragmatic responses. (See Table 4.2)

4.2.2.3 Conversational repair

Both the overall analysis for this pragmatic domain (*conversational repair*) and the univariate analyses for each of the four items within this domain (i.e., *unfamiliar acronyms, muffled speech*, *ambiguous statements*, and *decreased volume*) revealed statistically significant differences between the TD and ASD groups' cue and error scores (See Table

4.3). Adolescents with ASD committed more errors and required more cues when trying to repair conversations and request clarification. (See Table 4.2)

4.2.2.4 Presupposition

Overall, there was a significant difference between the two groups in this pragmatic domain (*presupposition*): TD adolescents performed better than adolescents with ASD. In the univariate analyses of the error scores for the five items in this pragmatic domain, there were significant differences between the two groups in two items, *ambiguous articles* and *ambiguous pronouns*. Adolescents with TD performed better than adolescents with ASD in response to these items. In contrast, there were no significant differences between the two groups for the other three items, *comment contingently*, *too little verbal information,* and *too little written information*. Finally, there were significant differences between the groups in the cue scores for all items (See Table 4.3). Adolescents with ASD needed more prompts to trigger the target behaviours in response to these probes. (See Table 4.2)

In summary, overall, results of the item analyses of the error scores show that the two groups were significantly different in 10 out of 19 pragmatic behaviour items. The TD group performed better than the ASD group in these items. Adolescents with ASD have difficulties and committed more errors in discourse management, in *topic initiation, turn-taking, topic maintenance,* and *providing background information.* They also had difficulties in conversational repair and requesting clarification after *muffled speech, ambiguous statements, decreased volume,* and *unfamiliar acronyms*. Adolescents with ASD had difficulties with presuppositions, asking about *ambiguous pronouns* and *ambiguous articles*. However, results of the item analyses of the cue scores showed significant differences between adolescents with ASD and TD adolescents in all probes except one behaviour, *protesting*. While the TD group was more likely to produce the target pragmatic behaviours independently, the group with ASD needed more cues and prompts to produce almost all of the behaviours.

The adjusted mean error and cue scores for both groups in all 19 YiPP probes are presented in Table 4.2. More information about the different probes, the significant differences between the two groups, and differences in the error and cue scores from MANCOVA analyses are summarised in Table 4.3 (significant differences are marked by an asterisk *).

Table 4.2: *Adjusted means and standard errors of Error and Cue Scores for 19 YiPP Pragmatic Probes*

	Error scores		Cue scores	
	ASD (*n*= 15)	TD (*n*= 15)	ASD (*n*= 15)	TD (*n*= 15)
	ADJ M (SE)	ADJ M(SE)	ADJ M (SE)	ADJ M(SE)
Discourse management				
Initiation	0.95 (0.19)	0.24 (0.19)	2.83 (0.43)	4.90 (0.43)
Request information	0.74 (0.20)	0.12 (0.20)	3.43 (0.49)	5.16 (0.49)
Background information	1.12 (0.15)	0.38 (0.15)	2.33 (0.39)	4.52 (0.39)
Terminate topic	0.78 (0.16)	0.28 (0.16)	3.35 (0.37)	5.11 (0.37)
Turn-taking	1.07(0.12)	0.14 (0.12)	2.72 (0.30)	5.40 (0.30)
Topic maintenance	0.87 (0.14)	0.18 (0.14)	2.85 (0.38)	5.14 (0.38)
Communicative functions				
Hypothesising	1.01 (0.17)	0.72 (0.17)	2.07 (0.54)	3.05(0.54)
Commenting	1.18 (0.19)	0.81 (0.19)	1.64 (0.49)	3.95 (0.49)
Requesting	0.26 (0.10)	-3.33 (0.10)	4.87 (0.27)	5.85 (0.27)
Protesting/denial	0.99 (0.24)	0.53 (0.24)	2.57 (0.65)	3.88 (0.65)
Conversational repair				
Muffled speech	1.61 (0.12)	0.05 (0.12)	1.73 (0.39)	5.06 (0.39)
Decreased volume	0.91 (0.16)	0.22 (0.16)	2.87 (0.40)	5.19 (0.40)
Unfamiliar acronyms	1.21 (0.20)	0.18 (0.20)	2.55 (0.52)	5.05 (0.52)
Ambiguous statements	0.62 (0.16)	0.03 (0.16)	3.46 (0.33)	5.93 (0.33)
Presupposition				
Comment contingently	0.56 (0.11)	0.17 (0.11)	3.51 (0.26)	5.42 (0.26)
Ambiguous articles	1.24 (0.18)	0.48 (0.18)	2.18 (0.52)	4.08 (0.52)
Too little verbal information	1.15 (0.20)	0.57 (0.20)	2.65 (0.51)	3.74 (0.51)
Ambiguous pronouns	1.40 (0.20)	0.46 (0.20)	2.05 (0.49)	4.40 (0.49)
Too little written information	0.30 (0.10)	0.02 (0.10)	3.90 (0.21)	5.89 (0.21)

Note. *n*=number of participants, TD= typically developing group, ASD= autism spectrum disorder group, ADJ M = adjusted mean, SE=standard error

Table 4.3: *Summary of Between-subject Effects for 19 YiPP Pragmatic Probes (Error and Cue Scores)*

	Error scores				Cue scores			
	F	df	p	ηp^2	F	df	p	ηp^2
Discourse management								
Initiation	5.36	1	.028 *	.16	8.62	1	.007*	.24
Request information	3.59	1	.069	.11	4.68	1	.039*	.14
Background information	10.77	1	.003*	.28	12.04	1	.002*	.30
Terminate topic	3.41	1	.076	.11	8.39	1	.007*	.23
Turn-taking	37.29	1	.000*	.58	29.72	1	.000*	.52
Topic maintenance	8.32	1	.008*	.23	13.65	1	.001*	.33
Communicative functions								
Hypothesising	0.98	1	.329	.03	1.25	1	.027*	.04
Commenting	1.41	1	.244	.05	8.46	1	.007*	.23
Requesting	2.60	1	.118	.08	4.89	1	.036*	.15
Protesting/denial	1.35	1	.255	.04	1.54	1	.225	.05
Conversational repair								
Muffled speech	58.23	1	.000*	.68	27.70	1	.000*	.50
Decreased volume	6.80	1	.015*	.20	12.72	1	.001*	.32
Unfamiliar acronyms	9.85	1	.004*	.26	8.66	1	.007*	.24
Ambiguous statements	5.15	1	.031*	.16	21.23	1	.000*	.44
Presupposition								
Comment contingently	4.16	1	.051	.13	20.72	1	.000*	.43
Ambiguous articles	6.85	1	.014*	.20	5.04	1	.033*	.15
Too little verbal information	2.91	1	.099	.09	1.72	1	.020*	.06
Ambiguous pronouns	8.30	1	.008*	.23	8.78	1	.006*	.24
Too little written information	2.49	1	.126	.08	33.61	1	.000*	.55

Note. *F*=ratio resulting from a MANCOVA with IQ as covariate; df= degrees of freedom; p=level of significance; ηp^2=partial eta squared, * = p< 0.05

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4.2.3 Results of the two main pragmatic domains of the PPECS

Adolescents with ASD had an overall deficit in the two main pragmatic domains of the PPECS (i.e. communicative functions and, interaction and conversation) as assessed by their caregivers; this deficit was not reported by the TD groups' caregivers. The TD group had lower-mean scores in contrast to the higher-mean scores of adolescents with ASD, as the caregivers of adolescents with ASD reported that their children had more difficulties in response to the different pragmatic behaviours. (See Table 4.4)

Table 4.4: *Means and Standard Deviations of Two Pragmatic Domains in the PPECS*

Pragmatic domains	ASD (*n*=15)		TD (*n*=15)				
	M (SD)	ADJ M (SE)	M (SD)	ADJ M (SE)	F	df	p
Communicative functions	53.80 (7.10)	52.88 (2.16)	27.20 (6.74)	28.12 (2.16)	50.12	1	.001
Interaction & conversation	50.93 (9.13)	50.25 (2.37)	40.73 (5.56)	41.41 (2.37)	5.30	1	.029

Note. *n* = number of participants, TD = typically developing group, ASD = autism spectrum disorder group, M = mean, SD = standard deviation, ADJ M = adjusted mean, SE = standard error, *F*=ratio resulting from ANCOVA with IQ as covariate; df= degrees of freedom; p=level of significance.

ANCOVA was conducted to compare the conversation skills of participants with ASD and TD participants as perceived by their caregivers and measured using the PPECS, after controlling for the adolescents' non-verbal IQ. In ANCOVA, caregivers' answers to the modified PPECS questionnaire were the dependent variable, the TD and ASD groups were the fixed factor, and non-verbal IQ was the covariate. Caregivers' responses to the multiple-choice items in the modified PPECS (items represented the participants' pragmatic abilities) were scored in percentages. Higher percentages are sign of atypical behaviour and greater difficulties and lower percentages represent more typical behaviour, with a maximum of 100%.

After adjustment for non-verbal IQ, there was a significant difference between the two groups in their pragmatic behaviours in both pragmatic domains: communicative

functions [F (1.27)=50.12, p=.001, partial η2=.650]; and interaction and conversation [F (1.27) =5.30, p=.029, partial η^2=.164]. The TD adolescents' performances were better than adolescents with ASD as rated by their caregivers. (See Figure 4.3)
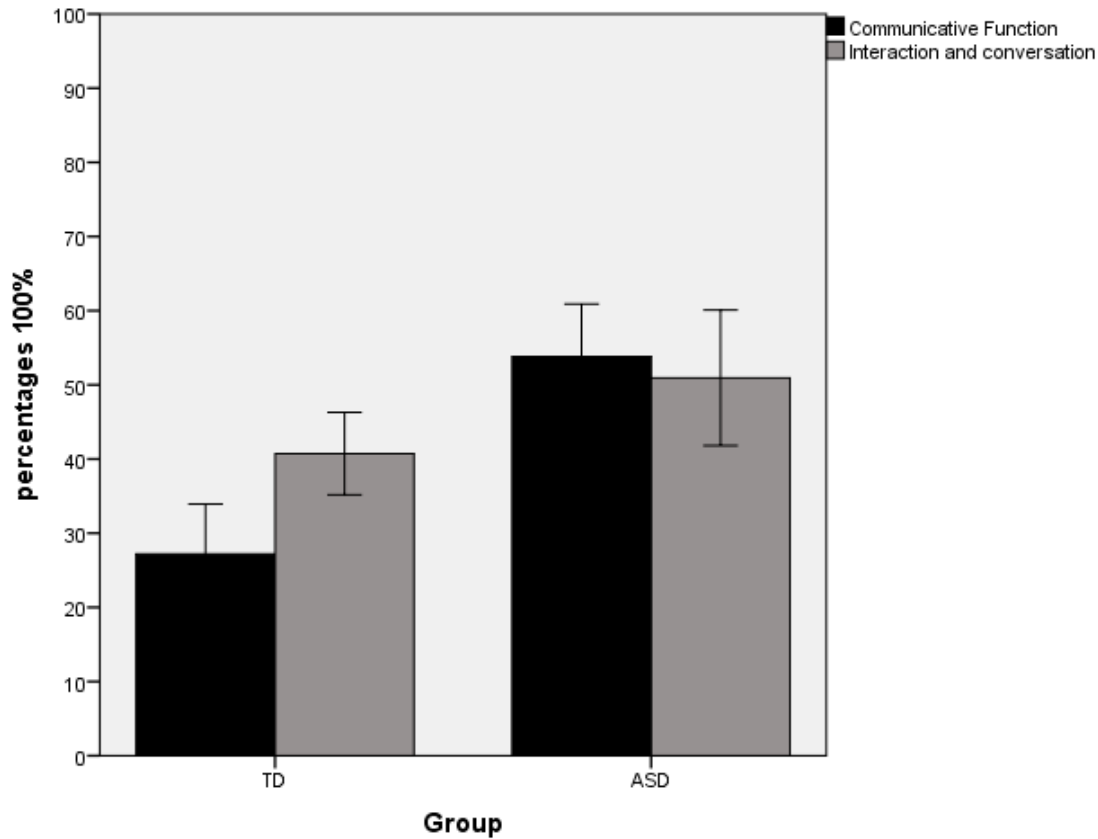
Error Bars: +/- 1 SD

Figure 4.3. *Group differences in responses to the PPECS questionnaire*

4.2.4 Results of the PPECS items analysis

In order to provide a closer examination of the differences between the groups' pragmatic behaviours and between the responses of the caregivers of each group to the 22 questionnaire items (which represent different pragmatic behaviours) a MANCOVA was conducted. The MANCOVA was conducted with groups (adolescents with ASD and TD adolescents) as fixed factor, caregivers' rating on the 22 items as dependent variables, and IQ levels as a covariate. The multivariate effects were significant for the overall 22 items [*F* (22.6)=5.02, *p*=.026, *partial* η^2=.949]. The TD group's performance was better than the ASD group as rated by their caregivers. Follow-up univariate analyses of each item's covariance

were also conducted to identify the items in which the groups differed. More details about the results of the item analyses within each of main pragmatic domains are presented in the following subsections.

4.2.4.1 Communicative functions

Overall, in this pragmatic domain (*communication functions*), there were statistically significant differences between the ASD and TD groups. The caregivers rated the TD adolescents' pragmatic abilities as better than the adolescents with ASD. In the univariate analyses of the 11 items in this pragmatic domain, there were statistically significant differences in all but four items, *giving information about feeling unwell, request for information, expression of upset emotion,* and *expression of pleasure emotion*. According to their caregivers, adolescents with ASD had more difficulties with *attention direction to self, attention direction to event, objects and people, request for assistances, rejecting, self-assertion, giving information about a new event,* and *narrative*. (See Table 4.5)

4.2.4.2 Interaction and conversation

Overall, there was a statistical difference between the two groups in this domain (*interaction and conversation*). Results of the univariate analyses of the 11 items in this domain revealed statistically significant differences in only three items, *presupposition, conversational repair*, and *terminating a conversation*. All p-values for these items were < 0.05. In contrast, no significant differences were found between the groups in *conversation initiation, maintain an interaction, overhearing conversation, joining a conversation, compliance with social conventions*, and *interactant reaction*. (See Table 4.5)

In summary, overall, results of the item analyses of the questionnaire scores show that ten pragmatic behaviours out of 22 differed significantly between the two groups. The TD group was rated by their caregivers as better than the ASD group in their pragmatic ability. Adolescents with ASD had difficulties in *directing attention to self, to event, to object,* and *to people; request for assistance; rejecting; self-assertion; giving information about a new event; narrative; presupposition*; *conversational repair;* and *terminating a conversation*. The adjusted means for all the 22 PPECS items are presented in Table 4.5. More information about results in the items that showed significant differences between the two groups and

results of the MANCOVA analyses are also summarised in Table 4.5 (significant differences are marked by an asterisk *).

Table 4.5: *Adjusted Mean Scores and standard errors, and Between-subject Effects for Group Factors for the 22 Items in the PPECS*

	ASD(*n*=15) ADJ M (SE)	TD (*n*=15) ADJ M (SE)	F	df	P	ηp^2
Communicative function						
Attention direction (to self)	56.32 (5.84)	24.80(5.84)	11.14	1	.002*	.29
Attention direction (to event, object, people)	44.29 (4.80)	25.70(4.80)	5.72	1	.024*	.17
Request for assistance	39.76 (6.21)	18.17(6.21)	4.61	1	.041*	.14
Request for information	57.93 (6.45)	40.40(6.45)	2.82	1	.104	.09
Rejecting	58.14 (4.67)	24.52(4.67)	19.82	1	.000*	.42
Expression of emotion (pleasure)	44.19 (4.22)	33.13(4.22)	2.61	1	.117	.08
Expression of emotion (upset)	61.26 (7.09)	38.73(7.09)	3.86	1	.060	.12
Self-assertion	63.97 (6.33)	30.69(6.33)	10.57	1	.003*	.28
Giving information (a)	51.54 (5.72)	22.98(5.72)	9.53	1	.005*	.26
Giving information (b)	46.27 (4.80)	32.72(4.80)	3.04	1	.092	.10
Narrative	57.66 (5.00)	19.46(5.00)	22.33	1	.000*	.45
Interaction and conversation						
Initiation	67.39(8.45)	54.74 (8.45)	0.85	1	.363	.03
Maintain an interaction (a)	45.19(5.98)	35.21 (5.98)	1.22	1	.278	.04
Maintain an interaction (b)	45.48(7.69)	62.51 (7.69)	1.87	1	.182	.06
Presupposition	46.38(4.30)	29.61 (4.30)	5.81	1	.023*	.17
Conversational repair	52.60(5.71)	26.39 (5.71)	8.06	1	.008*	.23
Overhearing a conversation	52.71(7.57)	37.88 (7.57)	1.46	1	.236	.05
Joining a conversation	58.11(6.13)	40.55 (6.13)	3.13	1	.088	.10
Terminating a conversation	68.77(3.84)	27.22 (3.84)	44.73	1	.000*	.62
Compliance with social conventions	43.66 (10.79)	67.80 (10.79)	1.91	1	.178	.06
Interactant reaction (a)	51.25 (6.04)	55.41 (6.04)	0.18	1	.673	.007
Interactant reaction (b)	20.80 (2.89)	19.79 (2.89)	0.04	1	.831	.002

4.2.5 Results for pragmatic behaviours common to the YiPP and the PPECS

Specific pragmatic behaviours in the two tools (YiPP and PPECS) were chosen to measure the same pragmatic skills from two different points of view, the participants' performances and their caregivers' perceptions. Although the pragmatic abilities have slightly different names in each tool, their categories are sufficiently similar to allow for comparison. Analysis results of the data from the two tools show some similarities and differences in the pragmatic language characteristics of adolescents with ASD compared to TD adolescents based on the two sources of information (See Table 4.6). These results can be summarised in three main findings.

First, according to both tools, there were significant differences between adolescents with ASD and TD adolescents in *conversational repair* and *presupposition* abilities. The TD group's pragmatic behaviour was better than the adolescents with ASD, both when rated by their caregivers and by their performance. Second, significant differences were found between the performances of the two groups (TD and ASD) in *topic initiation*, *topic maintenance*, and *turn-taking*. TD adolescents performed significantly better than adolescents with ASD in these pragmatic areas; however, their caregivers reported no significant differences between the groups. Finally, there were significant differences between the two groups in their *termination* and *protesting* abilities according to their caregivers; yet, these behaviours did not appear to be areas of difficulty in the adolescents' actual performance. More information about the adjusted means and the pragmatic behaviours with significant differences between the two groups, from the caregivers' perspectives, the adolescents' performances, or both, is summarised in Table 4.6 (significant differences are marked by an asterisk *).

Table 4.6: *Summary of Adjusted Mean Scores and Level of Significance for Pragmatic Behaviours Common to the YiPP and the PPECS*

Pragmatic behaviours	YiPP (participants' performance)			PPECS (caregivers' perceptions)		
	TD (n=15) ADJ M	ASD (n=15) ADJ M	P	TD (n=15) ADJ M	ASD (n=15) ADJ M	P
Initiation	0.24	0.95	.028*	54.74	67.39	.363
Topic maintenance	0.18	0.87	.008*	35.21	45.19	.278
Turn-taking/joining a conversation	0.14	1.07	.001*	40.55	58.11	.088
Terminate a topic	0.28	0.78	.076	27.22	68.77	.001*
Protesting/rejecting	0.53	0.99	.255	24.52	58.14	.001*
Conversational repair	0.12	1.09	.001*	26.39	52.66	.001*
Presupposition	0.34	0.93	.001*	29.61	46.48	.023*

Note. *n* = number of participants, TD = typically developing adolescents; ASD = adolescents with autism spectrum disorder; ADJ M = adjusted mean; p = level of significance, * = p< 0.05

Figure 4.4 presents the mean scores of the two groups' performances (YiPP) in the above-mentioned pragmatic behaviours and highlights the significant differences in behaviours, such as *conversational repair*, *turn-taking*, and *topic maintenance*.
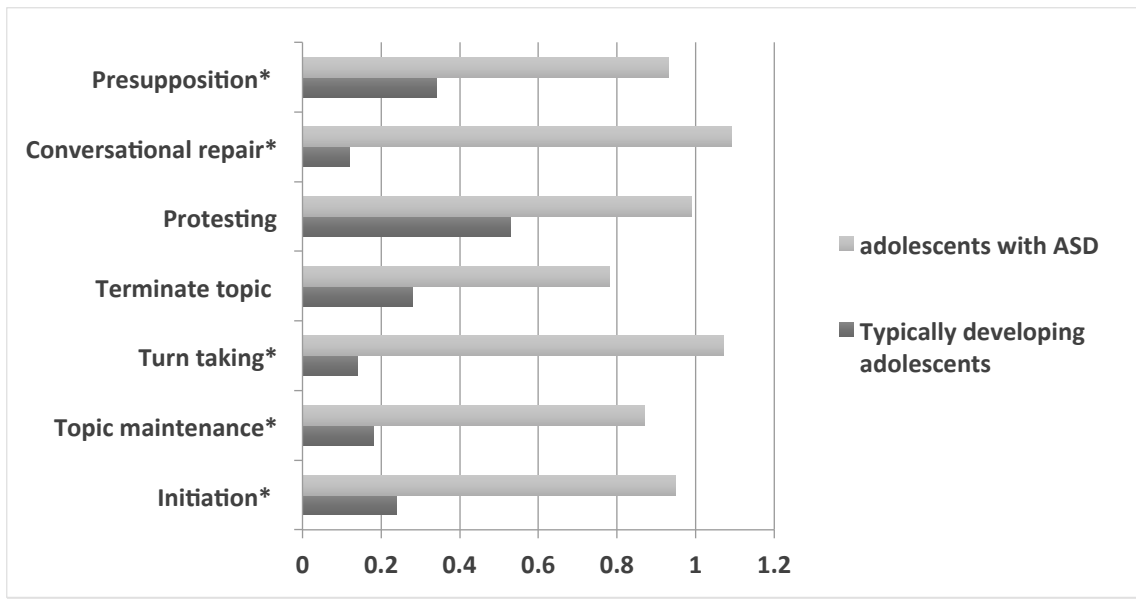
Figure 4.4. *Group differences in the performances of the adolescents in the YiPP*

Figure 4.5 presents the percentage means of the caregivers' ratings (PPESC) regarding the different pragmatic abilities of both adolescents with ASD and TD adolescents. This figure highlights the absence of significant differences in behaviours, such as *topic initiation*, *maintenance*, and *joining conversation*, in contrast to the YiPP results. In both figures 4.4 and 4.5, items with significant differences are marked by an asterisk *.
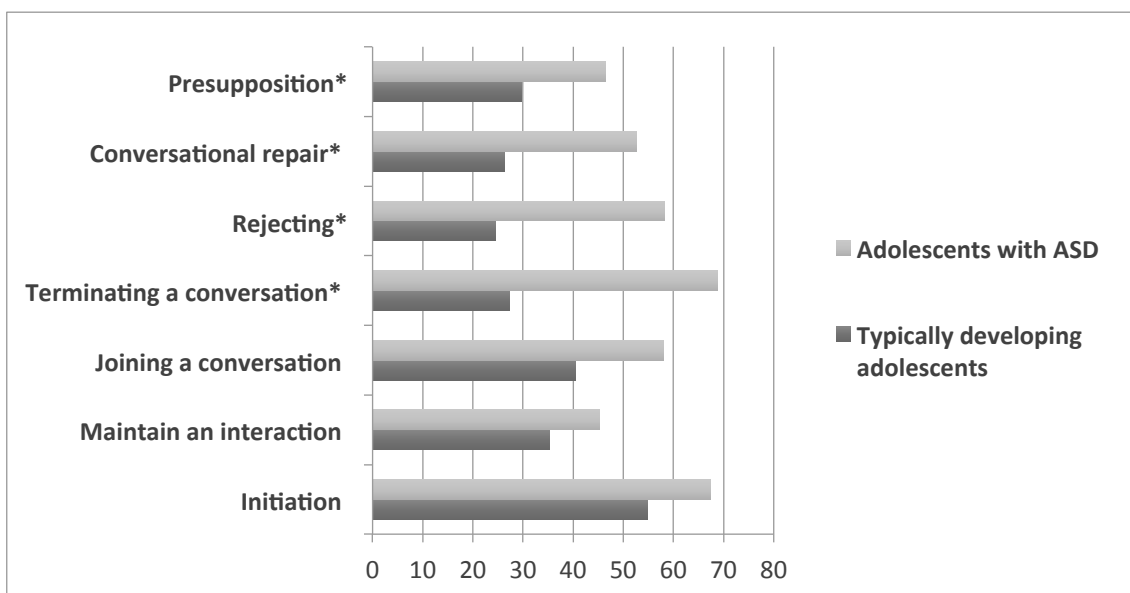
Figure 4.5. *Group differences in caregivers' responses to the PPECS questionnaire*

4.3 Qualitative Results

Previous literature has identified multiple pragmatic issues with dialogue among individuals with ASD. The conversation samples of adolescents with ASD were expected to be characterised by some pragmatic difficulties, such as deficits in managing discourse, communicative functions, repairing conversational breakdowns, and the ability to presuppose. This section presents an analysis of the sample conversations with adolescents with ASD and the control group, TD adolescents, to investigate the claims of common pragmatic problems in the literature.

The findings of the discourse analysis of the participants' language samples showed an overall pragmatic deficit and conversational difficulties in the conversations of adolescents with ASD compared to their TD peers. However, the pragmatic skills of participants with ASD were heterogeneous and there was variability in their performance levels. No common style of speech was found in the participants with ASD's conversations; instead, there were a variety of conversational difficulties in varying degrees. Despite this variability, a closer look at the conversation samples revealed some noticeable pragmatic difficulties that affected the flow of conversation among participants with ASD; whereas, no such difficulties were found in the pragmatic performance of TD adolescents in their conversation samples. This analysis focuses on the conversational difficulties that differentiate the two groups to provide a clear picture of the pragmatic performance levels of adolescents with ASD.

The most common pragmatic issues found in the conversation samples in this study can be explained using Grice's (1975) maxims. Grice (1975) argued that participants in a conversation typically implicitly follow a range of conversational 'maxims' which together constitute the 'cooperative principle'. It is usually expected that participants in any conversation will cooperate to understand each other and achieve a particular goal through the conversation. As Grice explains, the cooperative principle can be summarised as "Make your conversational contributions such as is required, at the stage at which it occurs, by the accepted purpose of direction of the talk exchange in which you are engaged" (Grice, 1989, p. 26). Within this cooperative principle, Grice distinguished four maxims: quantity, quality, relation, and manner. The maxim of quantity relates to the information quantity in an exchange, which should be "as informative as is required" and not "more informative than is required" (Grice, 1989, p. 45). The maxim of quality involves "try[ing] to make your contribution one that is true", and the maxim of relation advises, "Be relevant". Finally, the

maxim of manner relates to how the language in an exchange is used; it advises, "Avoid obscurity of expression, avoid ambiguity, be brief (avoid unnecessary prolixity), be orderly" (Grice, 1989, p. 46). However, these maxims are not a fixed system of rules that need to be followed, although people normally abide by them. People do not always follow these maxims, and they sometimes violate and flout them. Violation and flouting have different implications, and they sometimes bear more information than following the maxims (Grice, 1975). For more information on Grice's cooperative principle and the different maxims see Chapter Two, Section 2.2.6.2.

In this study, the participants with ASD had issues with the maxims of quantity, relation, and manner. Additional problems in their conversations not classified under Grice's maxims are discussed and classified as *other pragmatic issues*. This section is divided into these four main classifications, *issues in the quantity maxim, issues in the relation maxim, issues in the manner maxim* and *other issues*. Several categories were also added under these main four classifications. These difficulties are reviewed below, with examples (both in their original Arabic language and in English translation) from the conversation samples of adolescents with ASD and TD adolescents to highlight how the two groups differ and the pragmatic problems they experience. In the excerpts of the participants' conversations, R represents the researcher-interviewer and the participants are indicated with either ASD or TD and an identification number for each participant to comply with the ethical requirements of participant anonymity and confidentiality.

4.3.1 Issues in the quantity maxim

The *quantity maxim* involves providing just as much information in conversation as the purpose of the exchange requires (Grice, 1975). Successful conversationalists are required to develop a sense for the amount of information that is conventionally provided in conversation, as in in the following conversation with TD1:

Excerpt 1	**اقتباس 1**
13 R: What do you like to do in your free time?	١٣ R: إيش تحب تسوي في وقت فراغك؟
14 TD1: I like reading books and writing.	١٤ TD1: احب اقراء كتب واحب الكتابة .
15 R: And do you like watching TV?	١٥ R: وهل تحب تتفرج تلفزيون.
16 TD1: Not much, I only like watching movies on my iPad.	١٦ TD1: مو كثير، بس احب اتفرج أفلام في الايباد

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In this example, the participant provided as much information as was required for communication and as expected by their conversational partner. He did not say too much, since he only listed his hobbies instead of his favourite books, for example, and not too little, as he spoke about watching movies on his iPad instead of providing just a "yes" or "no" answer. However, issues with the quantity maxim appeared in the conversations of six adolescents with ASD. Difficulties in providing the right amount of information among these participants appeared in the form of offering too much and unnecessary information, not giving enough information and providing too little information or repeating the same topics and information. (See Table 4.7)

4.3.1.1 Offering too much information

Some adolescents with ASD tended to provide unnecessary information or extensive elaboration on the conversation topic, information not required by their conversational partner and not important for the communication purpose. For example, in the following excerpts (2 and 3) of a conversation with ASD1, he tended to offer unnecessary responses and give detailed explanations to some questions. In Excerpt 2, when asked questions about his hobbies, ASD1 answered that he likes bowling; but then, even when the conversation was interrupted by a phone call, he returned to the topic of bowling and explained how he held the ball and named each finger used in this action (line 9), information that is commonly known and not important in this context. In Excerpt 3, the same participant gave the names of a teacher he liked and her child when answering a question about his school.

Excerpt 2	**اقتباس 2**
4 R: Do you have hobbies you like to talk about?	٤ R: هل عندك هوايات حاب تتكلم عنها؟
5 ASD1: Yes, I remembered, the hobby of bowling sport.	٥ ASD1: ايوا، افتكرت، هواية رياضة البولنج.
6 R: So your hobby is bowling.	٦ R: يعني هوايتك البولنج
7 ASD1: Yes, in all sports I try to win so that the report results will be good … (phone rings)	٧ ASD1: ايوا، في كل الرياضات انا احاول اني افوز عشان نتائج التقرير تكون كويسه …(هاتف يرن)
8 R: God bless.	٨ R: ما شاء الله
9 ASD1: Because if we lose, it means that I will not win. I need the three fingers, middle	٩ ASD1: لأنه لو خسرنا، هذا يعني اني ما راح افوز. احتاج ثلاثة اصابع ، الاصبع الوسط و البنصر و الابهام

finger, ring finger, and thumb to through the ball.

علشان ارمي الكوره.

Excerpt 3

إقتباس 3

18 R: How can you describe to me this Centre?

١٨ R: كيف تقدر توصف لي هذا المركز؟

19 ASD1: How can I describe this Autism Centre?

١٩ ASD1: كيف اقدر اوصف هذا المركز؟

20 R: Yes.

٢٠ R: ايوا.

21 ASD1: I've been studying here for a long time. There was an American teacher named X. She taught me (noise). I don't know if you can find her or not, but before she travelled with her son named Y.

٢١ ASD1: انا ادرس هنا من فتره طويلة. كان فيه مدرسه أمريكية اسمها X هيا اللي علمتني ماادري اذا تقدري تلاقيها او لأ، لكن قبل كذا وولدها اللي اسمه Yسافرت

Similarly, in Excerpt 4, participant ASD2 provided detailed explanation about the address of his sister's school when he could have answered with "yes" or "no". In fact, ASD1 and ASD2 seemed keen on talking, unlike most participants with ASD.

Excerpt 4

إقتباس 4

59 ASD2: But J's school is called My First Year.

٥٩ ASD2: بس مدرسة ج اسمها سنتي الأولى.

60 R: Whose school?

٦٠ R: مدرسة مين؟

61 ASD2: It's called My First Year.

٦١ ASD2: اسمها سنتي الأولى

62 R: My First Year?

٦٢ R: سنتي الأولى؟

63 ASD2: Yes, in X Street.

٦٣ ASD2 : ايوا في شارع X

64 R: In X street? Is this your sister's school?

٦٤ R: في شارع X؟ هاذي مدرسة اختك؟

65 ASD2: It is in X street, next to the blue house, there is a house for sale and a supermarket.

٦٥ ASD2: هيا في شارع X، جنب البيت الأزرق، فيه بيت للبيع و سوبر ماركت.

4.3.1.2 Offering too little information

Other participants with ASD tended to offer less information than would be expected, not giving sufficient responses, or not answering. For instance, in a conversation with participant ASD3 (Excerpt 5), he simply answers "OK" to the question "Who are your friends?" In this case, ASD3 was expected to offer a list of names. Instead, I had to ask

directly for a list of names. Another example occurred in an interview with ASD4, where her answer to the same question was "many." Conversational partners would be expected to offer a more elaborate answer than that.

Excerpt 5	<div dir="rtl">**إقتباس 5**</div>
24 R: OK, do you have friends?	<div dir="rtl">٢٤ R: طيب، هل عندك أصدقاء؟</div>
25 ASD3: Yes.	<div dir="rtl">٢٥ ASD3: ايوا.</div>
26 R: Who are your friends?	<div dir="rtl">٢٦ R: مين هما اصحابك.</div>
27 ASD3: OK.	<div dir="rtl">٢٧ ASD3: طيب.</div>
28 R: Can you tell me what their names are?	<div dir="rtl">٢٨ R: ممكن تقولي ايش هيا أسمائهم؟</div>
29 ASD3: (breathing) Omar, Ali (…) Seba.	<div dir="rtl">٢٩ ASD3: (نفس) عمر, علي (...) صبا.</div>

Excerpt 6	<div dir="rtl">**إقتباس 6**</div>
15 R: So, do you have friends?	<div dir="rtl">١٥ R: اذن، هل عندك أصدقاء؟</div>
16 ASD4: Yes, I have.	<div dir="rtl">١٦ ASD4: ايوا، عندي.</div>
17 R: Can you tell me who your friends are?	<div dir="rtl">١٧ R: تقدر تقول لي مين اصحابك؟</div>
18 ASD4: Many.	<div dir="rtl">١٨ ASD4: كثير.</div>

The conversations with ASD5 and ASD6 (Excerpts 7 and 8), also demonstrated offering too little information. ASD5 answered a simple "yes" to 14 out of 30 questions during the conversation with her. For some of those questions, "yes" was not appropriate, as I asked open-ended questions that required an explanation rather than a simple affirmative answer. I had to keep probing for more details, but ASD5 appeared unwilling to offer any more information. As in Excerpt 7, ASD5 was asked about her favourite TV programme twice and in slightly different wording to trigger a response, but the answer was just "Yes". This was also the case with ASD6, who either answered with a "yes" or just made a noise in response to both closed and open-ended questions; that is, the interviewee failed to offer enough information in the conversation (Excerpt 8).

Excerpt 7	<div dir="rtl">**إقتباس 7**</div>
12 R: What do like to watch on TV?	<div dir="rtl">١٢ R: ايش تحبي تتفرجي في التلفزيون؟</div>
13 ASD5: Basmah channel.	<div dir="rtl">١٣ ASD5: قناة بسمه</div>
14 R: Basmah channel. What do you like on Basmah channel?	<div dir="rtl">١٤ R: قناة بسمه. و ايش تحبي في قناة بسمة؟</div>

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15 ASD5: Yes.	١٥ ASD5: ايوا.
16 R: I mean, Which programme do you watch on Basmah channel? What do you like?	١٦ R: يعني ايش تتفرجي في قناة بسمة؟ ايش تحبي؟
17 ASD5: Yes.	١٧ ASD5: ايوا.

Excerpt 8	**اقتباس 8**
12 R: OK, tell me, do you like TV?	١٢ R: طيب، قولي، تحب التلفزيون؟
13 ASD6: Yes (noise).	١٣ ASD6: ايوا (ازعاج).
14 R: What do you like to watch? What do you like on TV?	١٤ R: ايش تحب تتفرج؟ ايش تحب في التلفزيون؟
15 ASD6: (laugh) Indian movies.	١٥ ASD6: (ضحك) أفلام هندية
16 R: Indian movies! Do you have a favourite one? What is your favourite Indian movie?	١٦ R: أفلام هندية! هل فيه واحد مفضل؟ ايش أفضل فيلم هندي عندك؟
17 ASD6: (noise) Yes (noise).	١٧ ASD6: (إزعاج) ايوا (إزاعاج).
18 R: OK, me too I like the Indian movies. It's fun, right?	١٨ R: طيب، انا كمان أحب الأفلام الهندي، ممتعه صح.
19 ASD6: (noise).	١٩ ASD6: (ازعاج).

However, offering too little information was not exclusive to conversations with adolescents with ASD. There were also instances when TD adolescents offered too little information. For example, in Excerpt 9, TD2 provided short and general answers rather than being specific and gave little detail as would be expected in this context.

Excerpt 9	**إقتباس 9**
7 R: OK, do you have friends?	٧ R: طيب، هل عندك أصدقاء؟
8 TD2: Yes.	٨ TD2: ايوا.
9 R: Then, who is your best friend?	٩ R: اذن، من اعز صيق لك؟
10 TD2: All of them.	١٠ TD2: كلهم.
11 R: All of them are your best friends? Isn't there any one favourite?	١١ R: كلهم اعز اصدقائك؟ ما في احد مفضل؟
12 TD2: No.	١٢ TD2: لأ

Despite this example, most of the TD participants showed a sense of the amount of information that is conventionally provided in conversations.

4.3.1.3 Repetition

The fact that the group with ASD showed deficits in the quantity maxim could explain why the adolescents with ASD tended to repeat information or repeatedly bring up the same topic. Some of the adolescents used certain questions or comments in a way that seemed almost obsessive. For example, case ASD3 repeated "football" four times towards the end of the conversation (Excerpt 10). The participant did not provide his own opinion or feelings about the sport. Instead, he just repeated the word.

Excerpt 10	<div dir="rtl">**إقتباس 10**</div>
61 R: Do you like football?	<div dir="rtl">٦١ R: هل تحب الكوره؟</div>
62 ASD3: Football?	<div dir="rtl">٦٢ ASD3: كوره؟</div>
63 R: Yes, football. Do you play football?	<div dir="rtl">٦٣ R: ايوا، الكوره. تلعب كوره؟</div>
64 ASD3: Do you play football?	<div dir="rtl">٦٤ ASD3: تلعب كورة؟</div>
65 R: Yes you. Do you play football or not?	<div dir="rtl">٦٥ R: ايوا انت. تلعب كوره والا لأ؟</div>
66 ASD3: Football.	<div dir="rtl">٦٦ ASD3: كوره.</div>
67 R: Is football fun?	<div dir="rtl">٦٧ R: هل الكوره ممتعه؟</div>
68 ASD3: Football.	<div dir="rtl">٦٨ ASD3: كوره</div>

4.3.2 Issues in the relation maxim

The relation maxim involves providing information and making contributions relevant to the topic of the conversation (Grice, 1975), as seen in the following conversation with TD3:

Excerpt 11	<div dir="rtl">**إقتباس 11**</div>
11 R: Yes, what do you like to watch on TV?	<div dir="rtl">١١ R: ايوا، إيش تحب تتفرج في التلفزيون؟</div>
12 TD3: Movies and TV series.	<div dir="rtl">١٢ TD3: أفلام و مسلسلات.</div>
13 R: And which kind of movies do you prefer?	<div dir="rtl">١٣ R: و إيش نوع الأفلام اللي تحبها؟</div>
14 TD3: I prefer comedy foreign movies.	<div dir="rtl">١٤ TD3: افضل الأفلام الأجنبية الكوميدية</div>

In this example, the participant's answer followed the relation maxim, since his answers to both questions were direct and relevant to the topic. However, the violation of the relation maxim appeared in the conversations of four participants with ASD in the form of different issues, such as failing to maintain conversation topic and making inappropriate comments and responses. (See Table 4.7)

4.3.2.1 Deficits in topic maintenance

A deficit in topic maintenance is a common issue for individuals with ASD (Landa, 2000; Loukusa et al., 2007; Simmons et al., 2014; Volden, 2017). This issue refers to rapid and inappropriate changes in conversation topic without giving the listener prior cues (Damico, 1985). Examples of issues with topic maintenance were found in conversations with three participants with ASD (ASD 1, ASD2, and ASD7; Excerpts 12, 13, and 14).

Excerpt 12	**إقتباس 12**
38 R: What do you watch on TV?	٣٨ R: ايش تحب تتفرج في التلفزيون؟
39 ASD2: But my dad, but my dad, but my dad's sitting room was renewed.	٣٩ ASD2: لكن بابا ، لكن بابا، لكن مجلس ابويا صار جديد
40 R: OK, what do you like to watch on TV?	٤٠ R: طيب، ايش تحب تتفرج في التلفزيون؟
41 ASD2: There is, but I didn't watch it from the beginning.	٤١ ASD2: في هناك، لكن انا ماشوفته من البداية.

Excerpt 13	**إقتباس 13**
14 R: What's the name of your school?	١٤ R: ايش اسم مدرستك؟
15 ASD7: Your school … I love presents, there are presents, I want presents!	١٥ ASD7: مدرستك...احب الهدايا، في هدايا، ابغى هدايا!
16 R: Hmm? Presents?	١٦ R: اممم؟ هدايا؟
17 ASD7: These…presents	١٧ ASD7: هاذي...الهدايا

Excerpt 14	**إقتباس 14**
58 R: She's the director of the university.	٥٨ R: هي مديرة الجامعة.
59 ASD1: The director!	٥٩ ASD1: المديرة!
60 R: Yes.	٦٠ R: ايوا.
61 ASD1: (…)	٦١ ASD1: (...)

62 R: Do you want to know her name?

62 R: تبغى تعرف اسمها؟

63 ASD1: Not at all, but I only know movies like those we have seen.

63 ASD1: مره لا، بس اعرف أفلام زي اللي شفناها.

In Excerpt 12, ASD2 did not respond appropriately the interviewer about what he likes to watch on TV, rather he shifted the topic completely to his dad's sitting room. In Excerpt 13, instead of answering a question about her school, ASD7 changed the topic to talk about presents because of something she saw in the room. In Excerpt 14, ASD1 completely changed the topic from the name of the school's director to movies.

4.3.2.2. Inappropriate comments and responses

Making inappropriate comments and responses are also common pragmatic problems for individuals with ASD (Tager-Flusberg et al., 2005; Paul et al., 2009). Inappropriate comments and responses are utterances that are not related nor connected to what preceded them and interpret what preceded them in an unexpected way (Damico, 1985; Tager-Flusberg & Anderson, 1991). Sometimes such comments and responses may be related to the main topic in some way but are not appropriate or suitable for the discussion and the context (Bishop & Adams, 1989).

Clear examples related to this issue were found in a conversation with ASD2. For example, in Excerpt 15, while still on the same topic (school), ASD2 did not give an appropriate answer to the teacher's question about whether he likes his school, even though the question was clear and simple. Instead, he asked for the school's address, which was an unexpected and inappropriate response.

Excerpt 15

إقتباس 15

7 R: OK, as you are a student in this school, what's the name of this school?

7 R: طيب بما انك طالب في هاذي المدرسة؟ ايش اسم هاذي المدرسة؟

8 ASD2: The X centre.

8 ASD2 : مركز X

9 R: Is it a good school? Do you like it?

9 R: هل هي مدرسة كويسه؟ تحبها؟

10 ASD2: And what's the address?

10 ASD2: و إيش هو العنوان؟

Similarly, in Excerpt 16, ASD2 did not give an appropriate response to the question of whether he has friends; he stated the names of his friends in response to the simple yes/no question, "*Do you have pals*?". In the same excerpt (lines 26 and 27), although ASD2

answered the question and his response was somewhat related to the conversation topic (*"What do you like to do when you're bored?"*), his response was unusual and it is uncommon to mention the details he did in response to such questions.

Excerpt 16	<div dir="rtl">**إقتباس 16**</div>
19 R: OK, do you have friends?	<div dir="rtl">١٩ R: طيب، هل عندك أصدقاء؟</div>
20 ASD2: Which friends?	<div dir="rtl">٢٠ ASD2: أصدقاء ايش؟</div>
21 R: A pal, do you have pals?	<div dir="rtl">٢١ R: صاحب، هل عندك أصحاب؟</div>
22 ASD2: Muhammad, Abdulrahman, Abdullah, Hassan.	<div dir="rtl">٢٢ ASD2: محمد، عبد الرحمن، عبدالله، حسن</div>
23 R: Are they his friends?	<div dir="rtl">٢٣ R: هذولا أصحابه؟</div>
24 Teacher: Yes.	<div dir="rtl">٢٤ معلمة: ايوا</div>
25 ASD2: there are four.	<div dir="rtl">٢٥ ASD2: هما أربعة.</div>
26 R: OK, now tell me what do you like to do when you're bored?	<div dir="rtl">٢٦ R: طيب، الان قول لي إيش تحب تسوي لمن تكون طفشان؟</div>
27 ASD2: There is, there is the Galaxy Tab I bought from Samsung stores.	<div dir="rtl">٢٧ ASD2: في، في جالكسي تاب اشتريته من محل سامسونج.</div>

In Excerpt 17, ASD2 shifted the conversation topic inappropriately and instead of talking about his school, he talked about his sister's school, its name, and its address, which was an inappropriate and unexpected response.

Excerpt 17	<div dir="rtl">**إقتباس 17**</div>
58 R: OK, my school is very big, and beautiful, what about yours?	<div dir="rtl">٥٨ R: طيب، مدرستي مره كبيره، وحلوه كيف مدرستك؟</div>
59 ASD2: But J's school is called My First Year.	<div dir="rtl">٥٩ ASD2: بس مدرسة ج اسمها سنتي الأولى.</div>
60 R: Whose school?	<div dir="rtl">٦٠ R: مدرسة مين؟</div>
61 ASD2: It's called My First Year.	<div dir="rtl">٦١ ASD2: اسمها سنتي الأولى.</div>
62 R: My First Year?	<div dir="rtl">٦٢ R: سنتي الأولى؟</div>
63 ASD2: Yes, in X Street.	<div dir="rtl">٦٣ ASD2 : ايوا في شارع X</div>
64 R: In X street? Is this your sister's school?	<div dir="rtl">٦٤ R: في شارع X؟ هاذي مدرسة اختك؟</div>
65 ASD2: it is in x street, Next to the blue house, there is house for sale and a	<div dir="rtl">٦٥ ASD2: هيا في شارع X، جنب البيت الأزرق، فيه بيت للبيع و سوبر ماركت.</div>

supermarket.

Another example of an inappropriate comment was found in a conversation with ASD4, when she failed to answer the question whether she enjoys watching TV. Instead, she stated that the TV in the interview room was not working. This led me to repeat the question and ask if she enjoyed watching television in general (Excerpt 18).

Excerpt 18	**إقتباس 18**
30 R: What about TV? Do you like watching TV?	٣٠ R: طيب و التلفزيون؟ هل تحبي تتفرجي تلفزيون؟
31 ASD4: It's not working.	٣١ ASD4: ما يشتغل.
32 R: Huh?	٣٢ R: ها؟
33 ASD4: It's not working.	٣٣ ASD4: ما يشتغل.
34 R: No, I didn't mean this TV, I mean do you like watching TV in general? At home for example?	R٣٤: لا، انا ما أقصد هذا التلفزيون، قصدي هل تحبي تتفرجي التلفزيون عموما؟ في البيت مثلا؟
35 ASD4: (No answer).	٣٥ ASD4: (لا إجابة)

4.3.3 Issues in the manner maxim

According to Grice (1975), the manner maxim deals with the way a message is said, not its content. This means making one's contribution to the conversation brief, clear, ordered, and unambiguous (Damico, 1985). An example of following this maxim was found in a conversation with the typically developing participant, TD4:

Excerpt 19	**إقتباس 19**
13 R: And did you come to the school yesterday?	١٣ R: وهل حضرت للمدرسة امس؟
14 TD4: No, I could not come because I was sick.	١٤ TD4: لا، ما قدرت اجي لأني كنت مريض

In this example, TD4 responded to the researcher's question and explained her absence in a brief, clear, and orderly manner. However, six participants with ASD violated this maxim several times. This violation was seen in issues with taking turns, failure to structure discourse, and linguistic non-fluency. (See Table 4.7)

4.3.3.1 Issues with turn-taking

Issues with taking turns occur when conversational participants do not notice the necessary cues to change speaker in a conversation. This failure may lead to not taking turns in the conversation in an appropriate manner by, for example, disregarding switching cues or inappropriate and ongoing attempts to speak, interrupting and preventing others from taking their turns, or not answering (Damico, 1985). Issues with turn-taking appeared in many of the conversations with participants with ASD, for example in Excerpts 20 and 21.

Excerpt 20	**إقتباس 20**
51 R: I want to talk to you. (noise) What about that, I will tell you about my school, and you tell me about yours. OK? May I start?	٥١ R: ابغى أتكلم معاك. (ازعاج) إيش رأيك راح اكلمك عن مدرستي و بعدين انت تكلمني عن مدرستك. طيب؟ ممكن ابدأ انا اول؟
52 ASD2: In the first year.	٥٢ ASD2: في السنة الأولى.
53 R: Let me start first, what do you think?	٥٣ R: خليني ابدأ انا اول، إيش رأيك؟
54 ASD2: mmm.	٥٤ ASD2: امممم.

In this example, participant ASD2 demonstrated difficulties in taking turns, since he did not know when to initiate his turn. He did not consider that I was asking for the initial turn. Instead, he intended to start when he said, "In the first year," which led me to reinforce that I wished to direct the conversation.

Excerpt 21	**إقتباس 21**
16 R: OK, do you like cars?	١٦ R: طيب، تحب السيارات؟
17 ASD3: A car.	١٧ ASD3: سيارة
18 R: Hmm? Which car do you like? Of which colour?	١٨ R: امم؟ ايش السيارة اللي تحبها؟ أي لون؟
19 ASD3: (5).	١٩ ASD3: (5).
20 R: What's the colour of your favourite car?	٢٠ R: ايش لون السيارة اللي تحبها؟
21 ASD3: Dark.	٢١ ASD3: غامق.

At the beginning of this conversation with ASD3, he failed to answer the question about cars and just repeated the word "car"; and in his second turn, ASD3 did not say anything. It was only later that ASD3 understood that an answer was expected from him. In

fact, in this conversation, he failed to answer several questions. ASD3 showed difficulty in understanding when it is necessary to answer questions.

4.3.3.2 Failure to structure discourse

Failure to structure discourse refers to discourse that becomes confusing and lacks an appropriate organisational plan (Damico, 1985). This failure manifests as an inability to establish references or relay information in a rational, sequential manner. Inability to establish references refers to the use of specific terms without establishing their reference earlier in the discourse, often causing confusion for the listener (Bishop & Adams, 1989). Individuals with ASD seem to find it difficult to use and identify the correct antecedents for pronouns in a conversation (See Young et al., 2005).

The issue of failure to structure discourse was found among some of the participants with ASD and negatively affected their conversations. For example, in a conversation with ASD8, he did not indicate who he was referring to when he said "she", assuming that I already knew who he was talking about. When I repeatedly asked who "she" is, ASD8 did not provide an appropriate answer (Excerpt 22).

Excerpt 22	**إقتباس 22**
24 ASD8: She is a very kind.	٢٤ ASD8: هي مره طيبه
25 R: Who is she?	٢٥ R: مين هي؟
26 ASD8: She plays with me.	٢٦ ASD8: هي تلعب معايا.
27 R: What's her name?	٢٧ R: إيش اسمها؟
28 ASD8: (…)	٢٨ ASD8: (....)
29 R: So, do you like her?	٢٩ R: طيب، يعني انت تحبها؟
30 ASD8: Yes.	٣٠ ASD8: ايوا.

Also related to structuring discourse, individuals with ASD often have issues relaying information in a rational, sequential manner (See Melillo and Leisman, 2009). They often have trouble relating speech in term of themes, time, and references and present information in unusual ways (De Villiers et al., 2007b). For example, when I asked ASD1 to talk to me, he agreed and said "but tell me"; he then talked about his friend but did not mention his friend's name before using the pronoun "he" and spoke of the past in present tense, causing disruption to the sequence of the conversation and confusion.

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Excerpt 23	إقتباس 23
40 R: Can I talk to you?	٤٠ R: أقدر أتكلم معاك؟
41 ASD1: Yes, but tell me.	٤١ ASD1: ايوا، بس قولي لي.
42 R: What do you want me to tell you?	٤٢ R: إيش تبغاني أقول لك؟
43 ASD1: He is not here.	٤٣ ASD1: هو مو هنا.
44 R: Who is he?	٤٤ R: مين هو؟
45 ASD1: He is sick and they are playing together outside.	٤٥ ASD1: هو مريض وذحين هما يلعبوا مع بعض بره
46 Assistant: He meant his friend X who was absent yesterday as he was sick.	٤٦المساعده: هو يقصد انه صديقه X كان غائب أمس لأنه كان مريض.

4.3.3.3 Linguistic non-fluency

A third issue relating to the manner maxim is linguistic non-fluency, which refers to unusual repetition, hesitation, or pauses in a conversation that makes it unclear and disruptive (Damico, 1985). Echolalia, commonly found in individuals with ASD, is unusual repetition in a conversation, such as delayed speech or immediately repeating words, phrases or sentences (Paul, 2001; McCormick et al., 2003; De Villiers et al., 2007b). Examples of this issue were found in the conversations of three of the ASD participants (ASD4, ASD5, ASD7). ASD7 repeated part of my question instead of answering it and repeated the word "presents" (Excerpt 24).

Excerpt 24	إقتباس 24
14 R: What's the name of your school?	١٤ R: إيش اسم مدرستك؟
15 ASD7: Your school.… I love presents, there are presents, I want presents!	١٥ ASD7: مدرستك...احب الهدايا، في هدايا، ابغى هدايا!

In another example, ASD4 repeated phrases and expressions, such as "red", and "the fire truck" (Excerpt 25).

Excerpt 25	إقتباس 25
44 R: Do you like the fire truck?	٤٤ R: هل تحب سيارة المطافي؟
45 ASD4: The fire truck?	٤٥ ASD4: سيارة المطافي؟
46 R: What colour is it?	٤٦ R: إيش لونها؟
47 ASD4: Red.	٤٧ ASD4: أحمر.

| 48 R: What does the fire truck do? | ٤٨ R: إيش تسوي سيارة المطافي؟ |
| 49 ASD4: Red. | ٤٩ ASD4: أحمر. |

ASD5 repeated the word "small", in response to the question "Is your school big or small?" Although he attended a big school, he said it was small, echoing my last word rather than offering the correct answer to the question. After a couple exchanges, ASD5 again repeated my last phrase, "very big". Later, ASD5 echoed another word, "write". In these instances (Excerpts 26, 27, and 28), there was no reason for saying these expressions other than to echo me.

Excerpt 26   <u>إقتباس 26</u>

| 22 R: Tell me, is your school big or small? | ٢٢ R: طيب قول لي، مدرستك كبيرة أو صغيرة؟ |
| 23 ASD5: Small? (noise) | ٢٣ ASD5: صغيرة؟ |

Excerpt 27   <u>إقتباس 27</u>

| 27 R: This school is very big. | ٢٧ R: هاذي المدرسة مره كبيره. |
| 28 ASD5: Very big. | ٢٨ ASD5: مره كبيره. |

Excerpt 28   <u>إقتباس 28</u>

| 52 R: OK, write. | ٥٢ R: طيب، اكتب. |
| 53 ASD5: Write. | ٥٣ ASD5: اكتب. |

4.3.4 Other pragmatic issues

Other pragmatic problems, not classified under Grice's maxims, occurred in the conversations of the participants with ASD. Issues were found with clarification requests, providing opinions, understanding non-literal language, and politeness. (See Table 4.7)

4.3.4.1 Inability to request clarification

Requesting clarification and repairing a communication failure can be problematic for individuals with ASD (Simmons et al., 2014). A clarification request usually happens when there is a breakdown in the conversation or when some information is unclear or difficult to understand (Damico, 1985). Both the listener and the speaker need to cooperate to overcome such communication breakdowns. The listener asks for clarification to repair the conversation, and the speaker responds to avoid a misunderstanding. An example of an appropriate request for clarification was found in a conversation with TD5:

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Excerpt 29	**إقتباس 29**
33 R: What do you like to do in your spare time?	٣٣ R: إيش تحب تسوي في وقتك الفاضي؟
34 TD5: You mean in my free time?	٣٤ TD5: قصدك في وقت فراغي؟
35 R: Yes, in general when you have free time, what is the thing that entertains you always?	٣٥ R: ايوا، عموما لمن يكون عندك وقت فاضي، إيش الأشياء التي تتسلى فيها عاده؟
36 TD5: Ah ha, I love playing football.	٣٦ TD5: اها، احب العب كورة.

In Excerpt 29, TD5 requested clarification, replying to my question with another question to make sure he understood the question correctly. This request prompted me to elaborate in the next turn. Clarification requests were not an issue for the TD group. However, three of the participants with ASD (ASD3, ASD4, and ASD6) seemed unable to request clarification when they did not understand a question. For example, in a conversation with ASD3 (Excerpt 30), the number of repetitions and pauses suggested ASD3 did not understand the question even when I rephrased it. Instead of asking for clarification, he repeated parts of my phrases and then shifted to a new topic. Later, ASD3 did not request clarification when he was asked about his hobbies, and he was unable to answer the question even after it was rephrased (Excerpt 31).

Excerpt 30	**إقتباس 30**
12 R: Can you tell me what's the name of your school?	١٢ R: تقدر تقول لي إيش اسم مدرستك؟
13 ASD3: Your school, yes.	١٣ ASD3: مدرستك، إيوا.
14 R: Yes, the name of the school that we are in right now?	١٤ R: إيوا، المدرسه اللي احنا فيها الان؟
15 ASD3: No, I want a red car.	١٥ ASD3: لأ، ابغى سيارة حمراء.

Excerpt 31	**إقتباس 31**
42 R: OK, do you have a hobby?	٤٢ R: طيب هل عندك هواية؟
43 ASD3: A hobby, OK (5).	٤٣ ASD3: هواية، طيب (5).
44: R: Yes, what do you like to do in your free time?	٤٤ R: ايوا، إيش تحب تسوي في وقت فراغك؟
45: ASD3: (7) OK.	٤٥ ASD3: (7) طيب.

ASD6 and ASD4 also did not request clarification when they did not understand questions. They either did not respond or waited for someone to offer clarification and then responded. For example, ASD6 was initially unable to provide the name of her school. When the question was reworded, she still did not understand. It was only when the assistant further explained the question that ASD6 offered an answer (Excerpt 32). Similarly, ASD4 said, "mmm" when she was unsure what she was asked or simply did not respond (Excerpt 33).

Excerpt 32	**إقتباس 32**
22 R: Can you tell me a little bit about your school, what's the name of your school?	٢٢ R: تقدري تكليمني شوية عن مدرستك؟ إيش اسم مدرستك؟
23 ASD6: (6).	٢٣ ASD6: (6).
24 R: What's the name of your school, this school where we are sitting?	٢٤ R: إيش اسم مدرستك ، هاذي اللي احنا جالسين فيها؟
25 ASD6: (……)	٢٥ ASD6: (.....).
26 Assistant: What is the school that you come to everyday and meet your friend?	٢٦ المساعده: ايش هيا المدرسة اللي تجي لها كل يوم و تقابلي اصدقائك؟
27 ASD6: (3) X Centre.	٢٧ ASD6: (3) مركز X.

Excerpt 33	**إقتباس 33**
21 R: Who is your best friend?	٢١ R: مين صديقتك المفضل؟
22 ASD4: mmm (4)	٢٢ ASD4: اممم (4)
23 R: What is the name of your best friend? Can you tell me?	٢٣ R: إيش إسم صديقتك المضلة؟ تقدرين تقولين لي؟
24 ASD4: (no answer)	٢٤ ASD4: (لا إجابة)
25 Assistant: X, is X your best friend?	٢٥المساعدة: X، هل X صديقتك المفضلة؟
26 ASD4: I love X.	٢٦ ASD4: احب X.

Among the adolescents with ASD were participants who did not have issue with clarification requests. ASD1 and ASD2 were exceptionally capable of asking for clarification whenever it was needed. For example, in conversation with ASD1, he questioned about the abbreviation "lab" twice (Excerpt 34, lines 30 and 32). He raised his intonation when he said the word "lab" as a way of asking for clarification. When I confirmed the question without further explanation, he requested clarification again, more directly.

Excerpt 34	إقتباس 34
29 R: There are many labs in my university.	٢٩ R: في كذا لاب في جامعتي.
30 ASD1: Labs?	٣٠ ASD1: لاب؟
31 R: Yes, labs.	٣١ R: ايوا، لاب.
32 ASD1: What does this mean?	٣٢ ASD1: إيش يعني؟
33 R: It is like a room where scientists do their experiments.	٣٣ R: زي الغرفة كذا العلماء يسوا فيها تجاربهم.

Similarly, ASD2 (Excerpt 35) chose to ask a clarifying question when he was asked whether he had friends. He answered after the question was rephrased.

Excerpt 35	إقتباس 35
19 R: OK, do you have friends?	١٩ R: طيب هل عندك أصدقاء؟
20 ASD2: Which friends?	٢٠ ASD2: أصدقاء ايش؟
21 R: A pal, do you have pals?	٢١ R: صاحب، هل عندك أصحاب؟
22 ASD: Muhammad, Abdulrahman, Abdullah, Hassan.	٢٢ ASD2: محمد، عبد الرحمن، عبدالله، حسن

4.3.4.2 Difficulties expressing opinions

Some individuals with ASD face difficulties expressing their opinion and offering clear reasoning for it (Griswold, 2016). Three of the adolescents with ASD (ASD2, ASD3, and ASD9) appeared to experience this problem in their conversations. For example, ASD2 did not answer the question about his opinion of the school and changed the topic as a way to avoid offering an opinion (Excerpt 36). Similarly, ASD3 did not offer an answer to a question about liking cars. Instead, he only said "a car" (Excerpt 37); and ASD9 did not provide an answer to a question about liking his school (Excerpt 38).

Excerpt 36	إقتباس 36
9 R: Is it a good school? Do you like it?	٩ R: هل هي مدرسة كويسة؟ هل تحبها؟
10 ASD2: And what's the address?	١٠ ASD2: و إيش العنوان؟

Excerpt 37	إقتباس 37
16 R: OK, do you like cars?	١٦ R: طيب، تحب السيارات؟
17 ASD3: A car.	١٧ ASD3: سيارة

Excerpt 38	<div dir="rtl">إقتباس 38</div>
14 R: Do you like it?	<div dir="rtl">١٤ R: هل تحبها؟</div>
15 ASD9: (No answer)	<div dir="rtl">١٥ ASD9: (لا إجابة).</div>

4.3.4.3 Inability to understand non-literal language

According to McCormick et al. (2003) and Paul (2001), inability to understand non-literal language, such as metaphors, idioms, similes, and irony, is a common pragmatic issue in people with ASD. When this issue occurs, the listener does not understand the speaker's intended meaning, leading to a literal use and interpretation of the language. This lack of understanding may be due to failure to consider the linguistic, social, or environmental context (Bishop & Adams, 1989). The inability to understand non-literal language was found in only one participant with ASD (ASD6). For example, in a conversation with ASD6, she did not seem to understand my praise when I called her a "hero". Instead, she asked, "Why, What do I do?"

Excerpt 39	<div dir="rtl">إقتباس 39</div>
34 R: What else do you do with your teacher?	<div dir="rtl">٣٤ R: إيش كمان تسوي مع معلمتك؟</div>
35 ASD6: I take dishes.	<div dir="rtl">٣٥ ASD6: أخذ الصحون.</div>
36 R: You take the dishes, you're a hero!	<div dir="rtl">٣٦ R: تاخذين الصحون، انت بطلة!</div>
37 ASD6: (4) Why, what do I do?	<div dir="rtl">٣٧ ASD6: (٤) ليه إيش سويت؟</div>

4.3.4.4 Issues with politeness

Politeness is a commonly reported pragmatic issue for individuals with ASD (e.g., Tager-Flusberg et al., 2005; Paul et al., 2009; Austin, 2013) Politeness means that speakers make their speech socially acceptable and avoid words or ideas that may insult or offend their listener(s) (Baltex, 1977). Issues with politeness were found in the conversations of two of the participants with ASD (ASD2 and ASD9). For example, ASD2 asked me to turn on the TV in the room. Even after I refused to do so and tried to distract ASD2's attention from the TV, he said that there was TV in the room and ordered me to turn it on now (Excerpt 40). ASD9 also showed issues with politeness when she did not respond to my question and when asked again, she ordered me to stop talking (Excerpt 41).

Excerpt 40	**إقتباس 40**
32 R: OK (…) OK, so do you like watching TV?	٣٢ R: طيب (...) طيب، هل تحب تتفرج تلفزيون؟
33 ASD2: I like it but I want you to turn this one on.	٣٣ ASD2: احبه بس ابغاك تشغلي هذا.
34 R: No, this one is not working, I mean the one at home. Do you like watching TV at home?	٣٤ R: لأ، هذه ما يشتغل، انا اقصد اللي ف البيت، تحب تتفرج تلفزيون في البيت؟
35 ASD2: There is a TV, turn on it now.	٣٥ ASD2: في هنا تلفزيون، شغليه الان.

Excerpt 41	**إقتباس 41**
27 R: So, do you have any friends?	٢٧ R: طيب، هل عندك أي أصدقاء؟
28 ASD9: (No answer)	٢٨ ASD9: (لا إجابة).
29 R: Can you tell me who are your friends?	٢٩ R: تقدري تقولي لي مين صديقاتك؟
30 ASD9: Shhhh, don't say a word.	٣٠ ASD9: اششش، لا تقولي ولا كلمة.

In summary, various pragmatic problems were found in the sample conversations of nine of the 15 participants with ASD. It was clear that there were variations in the discourse competencies of the adolescents with ASD. Some participants displayed a number of different issues in their conversations and others only two or three. For example, ASD2 had issues in seven out of the 12 pragmatic behaviours found in the sample conversations, although he showed very good language skills. ASD8, on the other hand, only showed problems in structuring discourse. However, the absence of some issues in some of the participants with ASD does not mean that they did not experience these issues; it may be that there was insufficient chance and time for them to appear. It is also notable that the TD group did not demonstrate issues with the pragmatic behaviours that the adolescents with ASD did. This indicates a difference in the pragmatic competencies of the two groups; adolescents with ASD had greater difficulties than TD adolescents in their conversations.

Finally, among the many common pragmatic problems reported in the literature on individuals with ASD and discussed in this study, not all had corresponding examples in the participants' conversation samples. Due to the heterogeneity of the pragmatic competence of participants with ASD, the limited number of participants in this study, and the short

conversation samples analysed, no claim can be made about the generalisability of these findings to discourse on the competencies of the wider community of individuals with ASD.

Table 4.7: *Summary of Common Pragmatic Problems Among Participants with ASD*

	ASD1	ASD2	ASD3	ASD4	ASD5	ASD6	ASD7	ASD8	ASD9
Issues in Quantity Maxim									
Offering too much information	✓	✓							
Offering too little information			✓	✓	✓	✓			
Repetition			✓						
Issues in Relation Maxim									
Deficit in topic maintenance	✓	✓					✓		
Inappropriate comments		✓		✓					
Issues in Manner Maxim									
Issues with turn-taking		✓	✓						
Failure to structure discourse	✓							✓	
Linguistic non-fluency				✓	✓		✓		
Other Issues									
Inability to request clarification			✓	✓		✓			
Difficulties expressing opinion		✓	✓						✓
Inability to understand non-literal language						✓			
Issues with politeness		✓							✓

Note. ASD= participants with autism spectrum disorder, ✓= participant with this specific issue

4.4 Summary

This chapter presented the results of the analyses of the data collected using the caregiver questionnaire (PPECS), semi-structured conversations with the adolescents (YiPP), and the adolescents' language samples. Both the quantitative and qualitative approaches were utilised in this study in order to gain a comprehensive picture, from different sources of information, of the pragmatic and conversational characteristics of adolescents with ASD in comparison with TD adolescents.

The findings show that engaging in conversations and interactions was more challenging for the adolescents with ASD compared to their TD peers. Adolescents with ASD experienced many pragmatic difficulties as evident in their weak performance in the YiPP and in their conversation samples. The caregivers' ratings in the PPECS questionnaire also indicate some conversational difficulties in the language of the adolescents with ASD. Interestingly, several similarities and differences were found between the caregivers' opinions and the participants' performances in some of the pragmatic behaviours common to both the YiPP and the PPECS. The differences and their possible causes, along with a comprehensive discussion of the study findings as a whole and in relation to existing literature, are discussed in more detail in the next chapter.

Chapter Five: Discussion

5.1 Introduction

The objective of this study was to explore the pragmatic and conversational skills of adolescents with autism spectrum disorder (ASD), their competencies and deficits, compared to a control group of typically developing (TD) adolescents. This study employed both quantitative and qualitative methods to gain a comprehensive understanding of the pragmatic abilities of adolescents with ASD and TD from two perspectives, their own performance and their caregivers' ratings of their performance. In this chapter major findings are presented, interpreted, and discussed in relation to the main research hypotheses, and previous studies. The chapter is organised according to the main research hypotheses:

1. Adolescents with ASD were expected to lack some of the pragmatic and conversational abilities of TD adolescents with respect to *discourse management*, *communicative function*, *conversational repair*, and *presupposition*.
2. The caregivers' perceptions were expected to highlight the ASD adolescents' lack of some of the TD participants' pragmatic abilities.
3. The perceptions of the caregivers were expected to align systematically with the observed strengths and weaknesses of the ASD adolescents' pragmatic and conversational abilities.

The first hypothesis, on the pragmatic and conversational abilities of adolescents with ASD compared to TD adolescents, was explored through the performances of the adolescents in semi-structured conversations, using the Yale *in-vivo* Pragmatic Protocol (YiPP), and in natural language samples, which were analysed using discourse analysis methods. The second hypothesis, also on the pragmatic and conversational abilities of adolescents with ASD compared to their TD peers, was explored through the caregivers' perspective, using the modified Pragmatics Profile of Everyday Communication Skills in Adults (PPECS). Finally, the third hypothesis, on the similarities and differences between the participants' performance and the caregivers' perceptions of their performance, was explored through comparative description of the YiPP and the PPECS results.

The study results show that adolescents with ASD had more difficulties than their TD peers, according to their performances, with respect to the four main pragmatic domains under investigation, discourse management, communicative functions, conversational repair, and presupposition. The items analysis of the different pragmatic behaviours within each domain revealed further differences between the groups and areas of pragmatic strengths as well. The caregivers' perceptions of the pragmatic skills of the participants also revealed that adolescents with ASD had more pragmatic difficulties than their TD peers; however, their perceived issues appeared in some pragmatic abilities but not in others, and they demonstrated both difficulties and abilities in their pragmatic behaviours. Finally, the results show differences and similarities between the results based on the participants' performances and the results based on the caregivers' perceptions of the participants' pragmatic behaviours.

5.2 Hypothesis One: Adolescents with ASD were expected to lack some of the pragmatic and conversational abilities of TD adolescents with respect to discourse management, communicative function, conversational repair, and presupposition.

The study results of the quantitative and qualitative analyses of the adolescents' performances support the first hypothesis: Adolescents with ASD had more difficulties than their TD peers in the four main pragmatic domains, discourse management, communicative functions, conversational repair, and presupposition. However, despite the significant differences in the overall performances of the two groups (ASD and TD) in these domains, closer inspection of the items within each domain revealed differences in some items but not in others. For example, in behaviours such as requesting information and objects, commenting, hypothesising, and protesting, no differences were found between the groups in participants' performances. While pragmatic issues were found among participants with ASD in other pragmatic behaviours such as topic initiation, turn-taking and politeness.

In the following, these results will be discussed in detail in light of the four main pragmatic domains and in relation to Grice's (1975) cooperative principle and conversational maxims, particularly the quantity maxim (i.e., the amount of information provided in a conversation should be sufficient for the exchange purpose), the relation maxim (i.e., the contributions of conversational partners should be relevant to the topic of discussion), and the manner maxim (i.e., conversational partners should use appropriate style, clarity, and order in conversation).

5.2.1 Discourse management

Discourse management is considered the most challenging pragmatic ability, as it requires many complex and advanced conversational skills (Landa, 2005). Managing conversations requires using many skills simultaneously, such as attention and following social rules in a particular context, observing one's own and the other conversational partner's comprehension, and organising the linguistic form and content of the conversation (Landa, 2005). In this pragmatic domain, overall deficits were found among participants with ASD, and TD adolescents performed better than adolescents with ASD. A detailed analysis of different items within this domain revealed that participants with ASD faced difficulties in taking turns during conversational exchange and initiating and maintaining conversations. These results correspond to other studies on conversational problems in autism when using abilities such as initiation, turn-taking and topic maintenance (e.g., Baltaxe, 1977; Tager-Flusberg & Anderson, 1991).

Despite the prompted situations in this study and cues provided to trigger participants' involvement in the conversations, the results were the same as studies that measured participants' ability in informal situations or through spontaneous speech. This shows that even with cues and stimuli, managing discourse is a challenging and difficult task to perform for adolescents with ASD. Other pragmatic abilities, such as communicative functions, may improve with the help of cues and prompted situations, as was the case in this study (more on this finding in the following sections). The specific difficulties that participants with ASD demonstrated in their performances in this pragmatic domain are discussed below in more detail.

5.2.1.1 Deficits in turn-taking

Issues with turn-taking appeared in the performances of participants with ASD compared to the TD participants both in their semi-structured conversations (measured using the YiPP) and in their language samples (analysed using discourse analysis). A deficit in turn-taking is an issue in reciprocity, which is commonly reported in individuals with ASD, and it extends to the capacity to respond to the conversational input of others and to guide conversations to obtain certain information from other conversational participants (Baron-Cohen, 1988; Chuba et al., 2003).

In this study, the inability of participants with ASD to take turns in conversation appeared in different forms. For example, participants with ASD were less responsive than their TD peers to my cues to take turns in a conversation. When I tried to give the participants cues to take turns, such as suggesting a new conversation topic and waiting for them to take their turn, most adolescents with ASD did not respond appropriately. Some participants with ASD also experienced issues with timing. Their pauses and hesitations in some of the conversations may be interpreted as delays in taking their turn. In addition, a few of participants with ASD tended to be more talkative than others. They constantly interrupted me and monopolised the conversation by maintaining the role of the speaker without giving me the opportunity to speak.

5.2.1.2 Deficits in initiating conversations

Adolescents with ASD in this study also showed deficits in their ability to initiate conversations appropriately. For example, when I gave them the opportunity to choose a conversation topic by asking them questions, like *"What would you like to talk about?"*, as a way of initiating a conversation with them, most adolescents with ASD did not offer a topic to start the conversation. In contrast, most of the TD participants had no difficulty starting a conversation with me and choosing a topic to talk about. Participants with ASD needed more cues than their TD peers to start a conversation with me, and I offered them a variety of topics to choose from, such as hobbies and school.

Some previous studies have also reported difficulties in spontaneous communication and initiating appropriate speech and interaction among individuals with ASD (Stone & Caro-Martinez, 1990; Chiang & Carter 2008; Duffy & Healy, 2011). However, the reported difficulties in initiation in some previous studies refer to initiating spontaneous communication, which occurs without the help of verbal or non-verbal cues and prompts (Duffy & Healy, 2011). In this study, while different cues were provided to stimulate the participants to initiate topics and start conversations, the participants with ASD still struggled and showed difficulties in initiation. This finding is contrary to previous studies which found that individuals with autism perform better in elicited communication than in spontaneous communication and produce more positive social behaviour, including increased verbal initiation (Strain et al., 1979; Reagon & Higbee, 2009; Wichnick-Gillis et al., 2016).

5.2.1.3 Deficits in maintaining conversations

Difficulties in maintaining conversations and interactions were also found among participants with ASD in this study. Participants with ASD did not perform at the same level as the TD group when expanding on the topic of conversation and adding new and relevant information to the ongoing topic. During conversations with me, some of the adolescents with ASD had issues with the *maxim of relation* (i.e., making relevant contributions to the topic of the discussion; Grice, 1989). They struggled to maintain the topic of conversation and inappropriately shifted or drifted from the topic. Some adolescents with ASD also showed a tendency towards offering inappropriate and irrelevant comments and responses. Although these responses and comments were at times structurally correct, they were unusual and unrelated to the context and disrupted the flow of conversation. For example, when I asked a participant with ASD whether he liked his school, he responded unexpectedly by asking me if I wanted to know the address of his school or his sister's school. Such examples of inappropriate responses were not found in the utterances of the participants in the TD group. Tager-Flusberg and Anderson (1991), Landa (2000), Tager-Flusberg et al. (2005), Paul et al. (2009) and Volden (2017) also reported that individuals with autism have difficulty in maintaining conversation topics and responding appropriately in conversations. Happé (1993) and Adams et al. (2002) further reported that even though some individuals with ASD may respond to questions in conversations, in most cases, their answers are not related to the communication context.

Results of this study coincide with previous studies (e.g. Baron-Cohen, 1988; Landa, 2000; Paul et al., 2009; Duffy & Healy, 2011) regarding the deficits of individuals with ASD in different discourse management skills, such as turn-taking and topic initiation and maintenance, despite the stimuli and cues they received in this study. This finding may point to the complexity of these skills and how challenging it is for adolescents with ASD to perform them. Deficits in these skills are also related to deficits in reciprocity, which are persistently found in individuals with ASD and one of ASD's diagnostic criteria (i.e., deficits in social communication and social interaction; APA, 2013). Deficits in reciprocity may explain the difficulties found among the adolescents with ASD in this study and in other studies on the conversational abilities of people with ASD.

A possible reason for the impairments in the discourse management domain found among the participants with ASD may be related to their inability to focus on relevant

information and process contextually-related information; this may negatively affect their ability to notice different cues in the context of conversational exchange, such as cues that signal turn-taking, cues to change the topic of conversation and initiate a new topic, and cues to contribute new and information relevant to the topic (See Norbury & Bishop, 2002; Loukusa et al., 2007; De Villiers et. al, 2012).

5.2.2 Communicative functions

An overall deficit in communicative function was found in the performances of adolescents with ASD. This deficit is widely reported in studies on individuals with ASD (e.g., Wetherby & Prutting, 1984; Kasher & Meilijson, 1996; Krantz & McClannahan, 1998; Wetherby et al. 2007). It is commonly agreed that children with autism show deficits in performing most communicative functions, either through speech or gestures (Stone, & Caro-Martinez, 1990). However, a close analysis of the items in this domain revealed that the adolescents with ASD did not differ from their TD peers in the communicative functions explored, including requesting behaviour (requesting information or an object), hypothesising, commenting and protesting.

The reported abilities of adolescents with ASD in this study in some communicative functions, especially in commenting, hypothesizing, and requesting information, are a surprising result that contradicts most previous studies about communicative functions in autism (e.g. Carr & Kologinsky, 1983; Stone & Caro-Martinez, 1990; Tager-Flusberg, 1993; Camaioni et al., 1997; Tager-Flusberg et al., 2005). Deficits in these functions are commonly reported in individuals with ASD, as they are related to social interaction (in contrast to functions related behaviour regulation, such as requesting an object and protesting), a core area of deficit in ASD (APA, 2013). The emergence of these skills among the participants with ASD in this study may be the result of the different cues they received as well as the prompted situations they encountered in which different stimuli were presented.

5.2.2.1 Ability to request information

In this study, adolescents with ASD demonstrated an ability to request information about the conversation topic, which was not significantly different from their TD peers. For example, when triggered by a sentence like, *"I have some hobbies too",* some participants asked me about my hobbies. This finding contradicts widely-held views about the difficulties

that individuals with ASD experience when requesting information (Carr & Kologinsky, 1983; Phillips et al., 1995; Wetherby et al., 1998). However, the performance of participants with ASD in this study may have been affected by the cues they received in the conversations, which may have triggered their requests for information, as they received significantly more cues than their TD peers; cues ranged from expectant waiting to non-verbal and verbal cues (e.g., "Do you want to know about my hobbies?").

Simmons et al. (2014), similarly found no differences in the ability of participants with ASD and TD participants to request information in their study. Simmons et al. used the same tool that was used in this study (YiPP) and triggered the behaviour of their participants using different cues, which may prove the effectiveness of using cues and prompted situations to produce some pragmatic behaviours. Krantz and McClannahan (1998) also found that children with autism have limited ability to request information, as a means of topic initiation, which develops at a later stage. Yet, some children with autism demonstrate behaviours such as insistent questioning, which may be wrongly interpreted as a request for information, while it is used to draw the attention or initiate communication (Hurtig et al., 1980; Tager-Flusberg et al., 2005).

5.2.2.2 Ability to request objects

The ability to request an object was also found among participants with ASD, and there was no difference between their performance and that of the TD participants in this function. Requesting objects is an instrumental request, and it is usually used to obtain a certain object or control the behaviour of others to perform an action. In this study, for example, participants with ASD demostrated the ability to request a pen to complete a questionnaire I handed to them without giving them a pen, and there were not any pens or pencils in the room to trigger this behaviour. Previous studies suggest that, in general, individuals with ASD tend to use requesting behaviour more than the other communicative functions; and, in particular, they use requests to regulate the actions of others to meet their own needs, to attain specific goals, such as acquiring objects or actions, but not to obtain information or communicate with others (Carr & Kologinsky, 1983; Wetherby, 1986; Phillips et al., 1995; Wetherby et al., 1998; Calloway et al., 1999).

Therefore, the ability to request an object found among participants with ASD is supported by previous research; in contrast, however, the ability to request information, which was also found in this study, is not widely supported. It is commonly reported that individuals with ASD use instrumental requests more than any other request for communication, requesting information, and engaging in social interaction (Carr & Kologinsky, 1983; Krantz & McClannahan, 1998; Calloway et al., 1999). Wetherby and Prutting (1984), similarly, found that children with autism did not engage in speech acts for requesting information, showing off, or acknowledging others but used speech acts more for requesting objects and actions and expressing denial.

5.2.2.3 Ability to hypothesise and comment

Adolescents with ASD in this study revealed an ability to hypothesise (i.e., provide an explanation or express an assumption about certain issues) and to comment (i.e., provide comments and remarks related to the conversation topic). No significant differences were found between the performance of the participants with ASD and their TD peers in these communicative functions. These results correspond with the findings in Simmon et al.'s 2014 study. However, there was a significant difference in the number of cues the participants in the current study received. Participants with ASD required more cues than the TD participants to demonstrate these behaviours.

To measure the participants' ability to hypothesise, I pretended to struggle to get the tape recorder to work; this offered participants a chance to explain or hypothesise what the problem was. Participants with ASD provided some explanations about the reason the tape recorder was not working and suggestions on how to fix it. For example, some suggested it could be the batteries, others suggested restarting the tape recorder, and some took the tape recorder and tried to fix it themselves. However, the responses of the participants with ASD were not as spontaneous as the TD participants, and they required more cues to respond, including expectant waiting; non-verbal cues (e.g., gestures, facial expressions); and verbal cues (e.g., "Do you think there is something wrong with the tape recorder?").

Participants with ASD required more cues than their TD peers to demonstrate commenting as well; they required expectant waiting and non-verbal and verbal cues to produce this behaviour. For example, participants with ASD had different reactions to the sound of a bell, when I pretended to hit a box while trying to get them a pen. Some

participants noticed the sound and asked what it was, others tried to open the box and see what produced the sound, and some did not notice the sound until I asked "What made that noise?". Hearing the sound of the bell may have been a powerful stimulus that triggered participants to comment and explore the source of the sound. It is widely reported that people with ASD are sensitive and demonstrate different responses when they confronted with stimuli, such as light, noise, and textures (Fouse & Wheeler, 1997; Grandin, 1995).

In contrast to this study's findings, other studies have suggested that people with ASD experience difficulties in using verbal and non-verbal communicative functions for commenting on different environmental aspects, such as objects, actions, and the behaviour of others (e.g., Camaioni et al., 1997). Tager-Flusberg (1993) found that children with ASD rarely use language to comment on events, to attract attention, or to provide new information. In fact, in the current study, although participants with ASD did not differ from their TD peers in their commenting behaviours in the semi-structured conversations (YiPP), in the free conversation samples some participants with ASD offered inappropriate and irrelevant comments. For example, in response to a question about his favourite TV programme, one participant with ASD told me about his father's sitting room "But my dad, but my dad, but my dad's sitting room was renewed".

5.2.2.4. Ability to protest/reject

Adolescents with ASD in this study demonstrated an ability to protest and express rejection when triggered to demonstrate this behaviour by offering them two story books to choose from and giving them the wrong one. Participants with ASD performed at the same level as their TD peers, and there were no significant differences in their error and cue scores. However, the ways in which they expressed rejection and refusal differed. Some used conventional ways, such as expressing refusal verbally (e.g., saying "no, not this one", or just "no"), while others showed their rejection in a less conventional manner (e.g., shouting, getting angry, or getting up and taking the desired object by themselves). Wetherby and Prutting (1984) confirm this result in their study of the communicative and social abilities of children with autism. They found that children with ASD request and protest more frequently than other communicative functions, as the pragmatic behaviours of regulating the behaviours of others to achieve an environmental goal are some of the earliest functions to emerge and be acquired (Stone, & Caro-Martinez, 1990).

The ability of the participants with ASD in this study to perform communicative functions, such as requesting information and objects and protesting, may be the result of a number of factors. One may be related to the acquisition pattern of communicative functions, as some communicative functions are more complex to acquire than others (Wetherby, 1986). Functions associated with behaviour regulation, such as requesting or rejecting, are acquired more easily than those of social interaction, such as commenting (ASHA, 2006; Calloway et al., 1999). Moreover, some individuals with ASD show more social sensitivity when interacting with a familiar conversational partner and in familiar environment; this social senstivity affects the range of communicative functions an individual can perform (Bernard-Opitz, 1982). Additionally, the different cues and prompts provided to the participants play an important role in their abilities to perform communicative functions. The participants demonstrated responsiveness when triggered by different cues whether verbal or non verbal in this pragmatic domain.

The influence of the cues and prompted situations on the group's ability to perform different communicative functions, such as requesting, commenting and hypothesising, shows that it is more likely that these functions are less challenging for participants with ASD to perform. This can be compared with the group's difficulties in performing other pragmatic behaviours, such as managing discourse, repairing conversation and presupposition, where the participants also needed more cues, but these cues did not positively affect the group's performance. However, it should be noted that the prompting situations in this pragmatic domain (communicative functions) were more stimulating than in the other domains. More auditory and visual stimuli were included to trigger different communicative functions; for example, bells were used to trigger commenting and a broken tape recorder was used to trigger hypothesising. In contrast to the other pragmatic areas, such as discourse management, prompts were more associated with verbal hints presented in the context of conversation with participants. For example, participants were asked, *"What would you like to talk about?"*, which triggered different pragmatic behaviours. Therefore, the types of provided cues and prompts and the degree of their influence in stimulating and triggering different behaviours can also have an impact on the success of performing the targeted skill or behaviours.

The results of this study proved the importance of cues and illustrated that the participants with ASD were more responsive and produced the targeted communicative acts

with the help of these cues. Although the ability of participants with ASD to use communicative functions with the help of cues might not be considered a form of spontaneous communication, this ability plays a significant role in stimulating and improving communication in autism. Different kinds of support and cues are important for improving communication and facilitating the learning new skills in people with autism (Alberto & Troutman, 2006).

Prompting and stimulating are usually used as effective components in intervention programs targeting language and communication in autism (Finke et al., 2016). However, when intervention approaches which rely on prompts, cues and reinforcement are used it can be difficult for children to generalize lessons learned and apply the appropriate behaviours in novel situations that are outside the context of the original training situation. These approaches can also "lead to a passive style of communication" where the child might be able to respond to the prompts of communication, but may not have the ability to start and initiate communication (Paul, 2008, p. 838).

In spite of the importance of these cues and prompts in stimulating and producing some pragmatic behaviours, cues and prompts are not always present in communication and interactions in real life situations. Therefore, it is important that these prompts are not relied upon completely and permanently in communication, but are used as a starting point. Their use should be gradually discontinued until the individual can perform the targeted skill in an independently (Alberto & Troutman, 2006). Individuals with ASD should be trained to communicate independently and spontaneously in the absence of these prompts. Moreover, producing some pragmatic behaviours with the support of different cues might not always reflect the actual ability of the participants; in this study we observed that a participant's demonstrated ability to use some communicative acts is related to social interactions such as requesting information and commenting, which are a core area of deficit in individuals with ASD. However, the participants with ASD in this study might have taken advantage of the prompts that were provided to them (such as the use of bells to stimulate commenting).

5.2.3 Conversational repair

Participants with ASD in this study showed deficits in conversational repair and asking for clarification as compared to their TD peers. An imbalance in the ability to

participate well in a conversation and keep the exchange meaningful can lead to communication breakdown; then the need for repair and clarification arises (Volden, 2017). A breakdown occurs for several reasons, and there are a number of ways to repair it. Examples of breakdown include a sudden change of the conversation's topic without giving any prior hint to the listener. Also, participants who talk at the same time can violate the turn-taking principle of conversation, leading to breakdown.

Despite the prompted situations introduced to elicit participants' responses in this study (e.g., use of unfamiliar abbreviations, decrease speech volume, or muffled speech) and the cues provided in the conversations, adolescents with ASD failed to ask for clarifications appropriately. For example, most participants with ASD did not ask about the meaning of the abbreviation "lab" or what it stands for when I said, *"I have a lab in my school"*, in contrast to the TD participants who asked for the meaning of lab in different ways; for example by asking directly about the meaning or repeating the word in a questioning manner. In another example, when talking about schools with a participant with ASD, although he did not seem to understand my question clearly, as evident in his many pauses and hesitations, he did not ask for clarification. Even when I rephrased the question, he moved on to talk about a new, unrelated topic (i.e., cars). However, while most participants with ASD demonstrated a deficit in this pragmatic behaviour, two participants with ASD tended to be more talkative than others and showed that they were exceptionally capable of asking for clarification whenever it was needed in the free conversation samples. For example, they asked what the abbreviation "lab" means, and they repeated my utterances with raising intonation as a way of questioning and asking for clarification.

Although an overall deficit in conversational repair was found among the participants with ASD in this study, other studies indicate that individuals with ASD may have the ability to identify and repair conversational breakdowns (Geller, 1998; Volden, 2004; Voden, 2017). Volden (2004) found that sometimes children with autism recognise conversational breakdowns and the need for repair and even use various approaches for repair (Volden, 2004). Tager-Flusberg et al. (2005) found that though some individuals with ASD are capable of responding when asked for clarification, they tend to provide less-specific answers compared to TD individuals, and they often use simple ways to repair breakdown.

The deficits found in the ability of the participants with ASD in this study to repair communication may be attributed to difficulties found among individuals with ASD in

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responding to novel stimuli; these difficulties may account for problems in identifying contextual cues that signal topics and miscommunication (Courchesne et al., 1985). Scordo (2006) also reported that individuals with ASD have more difficulties repairing conversations in unstructured contexts than in more structured contexts (Scordo, 2006). This may explain the overall deficit found in the performances of participants with ASD in this study, as the conversations tended to be close to real-life communication and aimed to be as natural and unstructured as possible.

5.2.4 Presuppositions

A deficit in correctly interpreting presuppositions was another area of pragmatics that the participants with ASD in this study had difficulties with. Overall, participants with ASD committed more errors and had more difficulties than their TD peers in engaging with presuppositions. Presuppositional skills include providing information related to the conversation's topic, relevant remarks and background information for a conversational topic, and sufficient information to fulfil the listener's needs as well as distinguishing new information from old information in a conversation (Baltaxe, 1977; Tager-Flusberg & Anderson, 1991, Landa, 2005).

Impairments in presupposition found in this study include difficulties in recognising incorrect use of articles and statements with ambiguous pronouns. For example, when I said "*She always introduces the first part of each party*", without introducing a prior referent for the pronoun *she* in a conversation with the participants, TD adolescents immediately asked "*Who is she?*" Adolescents with ASD did not notice the incorrect use of the pronoun "*she*" even when I provided different cues, such asking "*Are you wondering who introduces the first part of each party?*" This difficulty reflects presuppositional deficiencies that may be relating to issues in foregrounding and backgrounding information and the absence of differentiation between old and new information among adolescents with ASD. Baltaxe (1977) found that adolescents with autism are unable to distinguish between old and new information. They were either unable to employ or unsuitably employed syntactic tools to indicate outdated information, including "anaphoric pronouns, definite articles, and relative clauses" and syntactic tools to indicate new information, including "fully specified noun phrases, indefinite articles, and cleft constructions" (p. 179).

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Numerous studies have reported similar results regarding the capacity of individuals with autism to engage in presupposition and follow well-established evidence that individuals with ASD are not always able to use and decode presupposition appropriately (e.g., Baltaxe, 1977; Paul & Cohen, 1984; Young et al., 2005). Paul et al. (2009) found that one of the most significant issues in the speech of individuals with ASD is that they seem unable to provide the appropriate amount of information to satisfy the listener's needs. Landa et al. (1995) also found that high-functioning adults and adolescents with autism committed more presupposition errors than their TD peers. Among these errors were assumptions that the listener had sufficient information about the topic of conversation, which affected their choice of phrases.

Deficits in the presuppositional skills among individuals with ASD affect their ability to adhere to Grice's maxim of quantity (Grice, 1975, Paul et al., 2009). Following this maxim requires knowledge of the desires, intentions, and goals of one's conversational partner for the ongoing conversation to provide the appropriate amount of information for the exchange purpose (Paul et al., 2009). Difficulties in providing appropriate amounts of information were found among some participants with ASD in this study. They appeared to flout the maxim of quantity (Grice, 1975) either by offering too much information, not providing enough information, or repeating information in conversations. For example, one participant with ASD gave an excessively detailed explanation about his hobby, when only asked to name his favourite hobby. The participants with ASD appeared to have difficulties in judging how much information to provide and did not seem to be able to establish what their conversational partner already knew and wanted to know and how much information was necessary.

The deficits found in the ability of the participants with ASD in this study to engage in presuppositions may be attributed to their deficits in reading the minds of others (i.e., deficits in the theory of mind); considering the perspectives of others and recognising what the listener may and may not know; and, thus, providing a sufficient amount of information in conversations. Despite hints that the conversational partner needs to know more or is not interested in knowing more about the conversation topic, some participants with ASD provided unnecessary information or extensive elaboration on the conversation topic, while others did not provide sufficient information and tended to offer less information than would be expected. Difficulties in presupposition among participants with ASD in this study may also be caused by their commonly reported deficits in using different contextual information

(i.e., social, physical, or linguistic) to interpret utterances in conversations. For example, they have issues in using the correct utterances in discourse to recognise whether the pronoun *she* has been mentioned before.

5.2.5 Other pragmatic issues

Additional pragmatic problems occurred in the conversations of the participants with ASD in this study that are not classified under the main pragmatic domains in this research. Some of the adolescents with ASD tended to violate Grice's (1975) *manner maxim* (i.e., the appropriate way to use language in an exchange, not its content), which is viewed as a failure to structure discourse and linguistic non-fluency. Issues with politeness were also found in the conversations of some adolescents with ASD.

5.2.5.1 Failure to structure discourse

Some of the adolescents with ASD showed difficulties in structuring discourse, and their discourse was unclear, confusing, and disorganised. These participants tended to demonstrate difficulty in relaying information rationally or sequentially; instead, they related information in unusual ways, negatively affecting the discourse structure and coherence. For example, in a conversation with a participant with ASD, he jumped in turn, interrupted me, and used a pronoun without mentioning a referent beforehand. He also used present tense to talk about a past event ("*He is sick and they are playing together outside*"), referring to a friend who was absent the day before due to illness. This caused disruption to the sequence of the conversation and confused me, requiring a teaching assistant to intervene and provide more information.

Difficulties in structuring discourse among some participants with ASD may be the consequence of other pragmatic difficulties (e.g., difficulties in turn-taking, topic maintenance, repairing breakdown, and presupposition), which negatively affect the structure, organization, and clarity of the discourse and may cause confusion and breakdown. Baltxe (1977) argues that the lack of different pragmatic abilities in individuals with ASD gives an impression that their discourse is pedantic and repetitive. Other researchers, such as Bishop and Adams (1989) and Young et al. (2005), agree that pragmatic issues, such as the use of unestablished referents and incorrect use of pronouns are more likely to cause confusion for the listeners and disruption in conversations.

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5.2.5.2 Linguistic non-fluency

Some participants with ASD in this study also experienced linguistic non-fluency. This difficulty appeared in their conversations in different forms, including unusual repetition and echolalia (i.e., repetition of immediate or delayed speech). Many examples of this kind of repetition appeared in the conversations with the participants with ASD. Participants repeated words like *presents, red*, and *the fire truck*, without reason other than to echo my utterances. Many researchers (e.g., McCormick et al., 2003; Paul et al., 2009) agree that phenomena like echolalia are a dominant characteristic among individuals with ASD. However, although such repetition sometimes might be interpret as non-functional behaviour, some researchers have identified its possible functions. For example, Prizant and Duchan (1981) argue that echolalia may function as a signal for turn-taking, assertion, affirmative answers, requests, self-regulation, and rehearsal to aid processing and it should not be seen as a non-functional behaviours but rather "as a continuum of behaviour ranging from automatic to intentional" (Wetherby, 1986, p. 299). Thus, non-fluency issues found in some of the participants with ASD in this study may not only be disruptive, they may in fact have a function.

5.2.5.3 Deficits in politeness

Finally, issues with politeness are another challenge that some of the participants with ASD demonstrated in this study; this deficit has been highlighted by many researchers of autism (e.g., Tager-Flusberg et al., 2005; Paul et al., 2009; Austin, 2013). For example, in this study, one of the participants with ASD inappropriately ordered me to turn on the television. Another participant with ASD, told me to shut up and stop talking in the middle of a conversation with her. These participants did not seem to be impolite on purpose, but they may not have some of the necessary skills required to activate and use the ability to be polite appropriately. They not have acquired the necessary rules of social politeness in linguistic exchanges between speakers of different ages and may lack the appropriate social knowledge to behave in a suitable manner.

Difficulties with politeness that some individuals with ASD experience may be the result of not understanding different social roles and contexts and the inability to use the appropriate register and adapt their style to the interaction context (Baltax, 1977). This difficulty with politeness may also be related to the deficit in "mindreading" in autism (Baltaxe, 1997; Surian et al., 1996). Behaviours such as politeness require awareness and

understanding of cognitive emotions, such as shame or pride, which constitute the logic behind politeness, which is to avoid threatening other people's pride and to defend one's own pride in the event of a threat (Brown & Levinson, 1987; Surian et al., 1996). However, this does not mean that individuals with ASD are unable to use politeness strategies at all. Sirota (2004) found that individuals with ASD indeed use politeness strategies, particularly in familiar contexts.

5.3 Hypothesis Two: The caregivers' perceptions were expected to highlight the ASD adolescents' lack of some of the TD participants' pragmatic abilities.

Supporting this hypothesis, the caregivers' assessments of the pragmatic abilities of both groups of adolescents in this study show that the conversational skills of the adolescents with ASD differed significantly from their TD peers in some of the pragmatic abilities explored; and, overall, adolescents with ASD had more pragmatic difficulties than their TD peers based in their caregivers' perceptions in both main pragmatic domains in the questionnaire (i.e., communicative functions and; interaction and conversation). However, the item analysis of the caregivers' responses to the PPECS questionnaire revealed mixed results regarding the pragmatic skills of the adolescents with ASD. There were significant differences in some of the items, compared to the TD adolescents, but not in others.

The caregivers identified a number of pragmatic behaviours as areas of deficit and weakness in the participants with ASD, including difficulties in directing attention to self or others, self-assertion, terminating conversations, expressing rejection or protest, presuppositions, and conversational repair. However, some pragmatic behaviours were not identified as difficulties in the participants with ASD and there were no statistically significant differences between the ASD group and the TD group in these areas; including, compliance with social conventions, giving information about feeling uncomfortable, expressing emotions of happiness or being upset, initiating conversations, maintaining interactions, and joining conversations. Overall, the caregivers of participants with ASD in this study perceived these adolescents as having difficulties and abilities in different pragmatic behaviours. However, the caregivers' assessments may have been influenced by a number of factors, which may also have caused inconsistencies between the participants' performances and the caregivers' assessments. These factors are discussed further in the discussion of the third hypothesis in the next section.

5.3.1 Pragmatic deficits identified by the caregivers

The participants' caregivers reported many difficulties related to the pragmatic behaviours of the adolescents with ASD, including deficits in their ability to draw and attract others' attention to self or to other people, objects, or activities; difficulties in asserting themselves and expressing their independence; as well as difficulties with presupposition, conversational repair, terminating conversation, and rejecting.

5.3.1.1 Difficulties drawing attention to self/ others/events/objects

The caregivers identified difficulties in drawing the attention of others to themselves and to others, objects, or events among the adolescents with ASD in this study. For example, caregivers reported that in situations where an adult is busy and the adolescent wants their attention or when the adolescent tries to direct the attention of others to objects or events they might consider interesting, they act in an atypical way to get attention. For example, they may make a noise, such as tapping or knocking, or pull at the adult and make sounds. Wetherby and Prutting (1984) also found that children with autism are unable to direct an adults' attention to themselves, while they are able to attract an adults' attention to a certain object.

This finding is supported by the commonly accepted view that individuals with ASD tend to have issues with jointly directing attention to someone else or an object (Landa, 2005; ASHA, 2006). Other researchers (e.g., Loveland & Landry, 1986; Mundy et al., 1990) have also found that, compared to normally developing children, children with autism display fewer instances of initiating and responding to joint attention and make fewer attempts to draw the attention of others. Deficits in this pragmatic ability may be related to reported deficits among people with ASD in their ability to share interest in a particular object or event with a conversational partner in social interaction (i.e., deficit in joint attention). Deficit in joint attention appears from early infancy in people with ASD and is one of its earliest symptoms, which contributes to the diagnosis of autism (Woods & Wetherby, 2003). However, other scholars (e.g., Gernsbacher et al., 2008) have found that individuals with autism do initiate joint attention at levels similar to their non-autistic peers, but they do so in less conventional ways.

5.3.1.2 Difficulties in self-assertion

Another difficulty that the caregivers identified in participants with ASD in this study is their inability to exhibit self-assertion and communicate that they can do things without asking for help. Self-assertion can be expressed by people in different ways, such as introducing oneself to others, interacting with others, doing things independently and without asking for help, or refusing help if it is offered. According to the caregivers, the TD participants demonstrate the ability to express their independence by, for example, stating that they can manage to do something without help or using gestures to ask adults to go away. The participants with ASD, on the other hand, are unable refuse help offered by an adult when they want to do things independently. Many studies have also found that children with autism have significant deficits in cooperation and self-assertion (e.g., Macintosh & Dissanayake 2006; Rao et al., 2008).

Difficulties in expressing independence in people with autism may be related to other deficits that have been reported widely in this population, such as deficits in executive functions (i.e., high-order processes necessary to control and regulate behaviours) and weak central coherence (i.e., inability to draw an overall contextual meaning and instead focusing on details; Frith & Happé, 1994; Landa, 2000). Performing some executive functions, such as planning, may be challenging for people with ASD (Landa, 2000) and affect their ability to act independently, without asking for help, when they struggle to understand the demands of a particular action and develop plans for its performance, especially in novel situations. Remembering and following the exact steps of a task is often difficult for individuals with ASD, as the relationships between different steps may be meaningless to them; and, thus, they often do not connect things in logical order but in an unusual way (Hume, 2004). Furthermore, focusing on details and ignoring the overall and main principle of an activity (i.e., weak central coherence) may affect their ability to apply what they have learnt about performing a specific activity independently when they face novel situations (Frith, 1989).

5.3.1.3 Issues with presuppositions and conversational repair

According to the caregivers, the participants with ASD also experience difficulties in engaging in presuppositions and in repairing conversational breakdowns. Adolescents with ASD have issues in predicting both what listeners already know and what they wish to know. This issue makes it difficult for them to provide the appropriate amount of relevant background information when they want to talk about something of which the adult has no knowledge. According to the caregivers' assessments, adolescents with ASD also tend to

struggle with conversation repair and providing clarification when the listener does not understand them. They may have atypical reactions to an adult's request for clarification; for example, they may stop talking or become angry. In contrast, the TD adolescents were considered by their caregivers' as more able to repair a conversation in the event of a misunderstanding or when they are asked for clarification. The TD adolescents tend to react in a natural and typical way, such as giving more information or using repetition for repair. As the pragmatic deficits in conversation repair and presuppositions among the participants with ASD in this study were also found in their actual performances, these deficits were explored in more detail in the discussion of the first hypothesis.

5.3.1.4 Inability to end conversations and express rejection

Finally, participants with ASD were also rated by their caregivers as being less able to end a conversation topic and to protest and express rejection than their TD peers. According to the caregivers, adolescents with ASD tend to demonstrate atypical behaviour in ending conversations in their daily interactions at home or at school, such as getting confused and angry and/or stopping suddenly and walking off. A number of studies (e.g., Chuba et al., 2003; Tager-Flusberg et al., 2005) have reported similar results that individuals with ASD appear to have difficulty terminating topics appropriately. Difficulties in terminating conversations can be linked to several factors, such as the preference of some people with autism to preserve topics they are interested in, their lack of understanding of non-verbal cues and body language, and their lack of attention and sensitivity to others (Tager-Flusberg et al., 2005; Paul, et al., 2009;). The inability to terminate conversations may also be related to a cognitive deficit in the executive function of inhibitive executive control, which refers to the inability to control and stop inappropriate behaviour and adapt to the context of a conversation, found in individuals with ASD (Landa, 2000).

Caregivers also identified deficits in the ability of participants with ASD to express rejection or protest when they are offered something that they do not like, such as a type of food or drink. In contrast to this finding, Wetherby and Prutting (1984), in their analysis of the speech acts of children with ASD, found that children with autism use some communicative functions for behaviour regulation, such as requesting and protesting, but they do not acquire these skills until they are older, and they may require intervention to do so. In addition, findings in the current study show that participants with ASD have the ability to protest and express rejection, but they expressed this ability in unconventional ways, such

as shouting or getting angry. However, the participants' difficulty in terminating conversations and rejecting behaviour were only reported by the caregivers; no difference were found in these pragmatic abilities between the adolescents with ASD and their TD peers in their actual performances. This inconsistency between the caregivers' ratings and the participants' performances is further explored in the discussion of the third hypothesis.

5.3.2 Pragmatic abilities identified by the caregivers

Despite the pragmatic difficulties of adolescents with ASD discussed above, the caregivers did not report differences between the two groups in some pragmatic skills, including complying with social conventions; expressing emotions, such as pleasure and being upset; giving information about feeling unwell or uncomfortable; and initiating, joining, and maintaining interactions. Positive caregiver ratings in these pragmatic behaviours are somewhat surprising for two reasons: First, these pragmatic skills are related to social and emotional deficits, which are common areas of deficits in autism (APA, 2013). Second, these reported abilities contradict deficits found in the performances of the adolescents with ASD in this study, in some of these abilities (e.g., initiating, joining, and maintaining interactions), as well as in previous studies that have reported these skills as areas of difficulty among people with ASD (e.g. Baron-Cohen, 1988; landa, 2000; Begeer et al., 2008; Paul et al., 2014). However, the positive ratings in this study may be the result of a number of influencing factors, such as the adolescents' familiarity with their caregivers, supportive environments, and the participants' IQ, which might have influenced the participants' performances and affected their caregivers' rating. These factors are discussed in more detail the following paragraphs.

5.3.2.1 Ability to comply with social conventions

The caregivers perceived adolescents with ASD as able to comply with social conventions. This finding is surprising, as social communication deficit is considered a core diagnostic feature of autism. According to the APA (2000), individuals with autism suffer from a poor understanding of social conventions, which may lead to failure in socialisation or the inability to maintain social relations appropriate to their level of development. Few previous studies support the finding that individuals with ASD have the ability to comply with social rules. Hopkins and Lord (1981) and Clark and Rutter (1981) reported that children with autism consider the behaviours of others and have different social responses to

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the different social contexts they encounter (Baron-Cohen, 1988). However, the ability to comply with social rules among individuals with autism may be limited to their interactions with conversational partners who adapt their behaviour and provide support, such as initiation and cues to trigger social interaction (Hopkins & Lord, 1981). The caregivers may use techniques to facilitate interactions with the adolescents with ASD in this study and may have, as result, a positive view of their ability in this regard.

5.3.2.2 Ability to express emotions and provide information about feelings

Caregivers of adolescents with ASD also reported that these adolescents do not have difficulties in expressing emotions, such as pleasure and being upset, and in giving information about feeling unwell or uncomfortable. Jaedicke et al. (1994), similarly, found no differences between individuals with ASD and a matched control group in their ability to express emotions verbally. Yet, emotional impairments are commonly reported in individuals with autism, and studies have shown that they have deficits in differentiating between emotions and describing their feelings (Begeer et al., 2008; Hill et al., 2004). Some longitudinal studies in children with ASD indicate that emotional competence may improve and progress with age, and that IQ affects the extent of this progress (Bieberich & Morgan, 2004). Thus, individuals with autism who have normal or high IQ levels have the potential to express feelings and gain a better understanding of the social world (Kasari et al., 2001). The relationship between IQ and the ability to expressed feelings in autism may explain the ability of participants with ASD in the current study to express some emotions as all study participants have an IQ within the average range.

5.3.2.3 Ability to initiate, join, and maintain interactions

Finally, caregivers did not report any significant differences between the two groups in their ability to initiate and maintain interactions and to join conversations. The caregivers perceived participants with ASD as having no difficulties when trying to start up conversations with others, maintaining the flow of conversations, and trying to join conversations or take turns. However, even when these adolescent demonstrated some of these abilities, they tended to rely on simple strategies to do so, such as following familiar routines and getting support from a familiar adult. For example, the adult may ask questions as a way to maintain conversations with individuals with ASD.

According to previous studies, individuals with autism rarely maintain conversations by expanding them or adding new information related to the topic (Tager-Flusberg & Anderson, 1991; Capps et al., 1998). Individuals with ASD have been reported to have a good grasp of turn-taking in conversations, mostly when interacting with a familiar person such as family members (Ochs et al., 2001). However, the actual performances of the participants with ASD in this study show that these pragmatic behaviours were areas of difficulties for them. Moreover, a large body of research on conversational problems in autism (e.g., Capps et al., 1998; Paul et al., 2014; Simmons et al., 2014), shows that individuals with ASD face difficulties engaging in the fundamental aspects of conversations, including initiating and sustaining conversations and appropriately taking turns.

5.4 Hypothesis Three: The perceptions of the caregivers were expected to align systematically with the observed strengths and weaknesses of the ASD adolescents' pragmatic and conversational abilities.

Surprisingly, this hypothesis was only partially supported by the findings, as some differences were found between the results of the participants' performances (YiPP and discourse analysis) and their caregivers' perceptions of their pragmatic behaviours (PPECS). The findings aligned in relation to the pragmatic difficulties of adolescents with ASD in *conversational repair* and *presupposition*. In contrast, a number of key difficulties, which were identified in the performances of adolescents with ASD, including deficits in *topic initiation*, *maintaining conversations*, and *turn-taking*, were not identified by the caregivers, who did not detect differences between the two groups in these behaviours. Furthermore, the ability to *terminate conversations* and express *protest* were reported as areas of difficulty among adolescents with ASD based on their caregivers' assessment, while no differences were found in the adolescents' actual performance compared to their TD peers in these behaviours.

5.4.1 Areas of pragmatic difficulties according to both actual performance and caregivers' perceptions

Deficits in *conversation repair* among participants with ASD in this study were found both in their performance and their caregivers' perceptions of their performance. Adolescents with ASD tended to struggle with conversation repair and asking for and providing clarification in cases of misunderstanding, despite the cues they received and prompts meant

to trigger this behaviour. Some participants with ASD also acted atypically in reactions to my requests for clarification; for example, they stopped talking or became angry. This difficulty, as discussed earlier, may be attributed to difficulties in identifying contextual cues that signal miscommunication and managing and engaging in conversations in unstructured and ever-changing communicative contexts.

In addition, deficits in *presuppositions* were also found among participants with ASD, according to both their performance and their caregivers' perceptions. They demonstrated an inability to differentiate between old and new information, provide appropriate amounts of information, and establish what their conversational partner already knew and wanted to know. Participants with ASD tended to offer too much information, by providing unnecessary information or extensive elaboration on the conversation topic, or not providing enough information, by repeating information in conversations and not giving sufficient responses. Deficits in presupposition among participants with ASD may be associated with their difficulties in understanding that other people have beliefs, knowledge, and emotions about an event or an object that may differ from their own (i.e., deficits in theory of mind). These deficits may also be related to difficulties in understanding different contextual information (i.e., social, physical, linguistic) in utterances in conversations.

5.4.2 Areas of difficulties according to the participants' actual performance but not their caregivers' perceptions

In contrast to the agreement between the two data sources regarding difficulties in presupposition and conversational repair among participants with ASD, deficits in other pragmatic areas—including *topic initiation*, *maintaining conversations*, and *turn-taking*—were identified in the performances of adolescents with ASD but not reported by the caregivers, who did not detect differences between the two groups in these behaviours.

During conversations with participants, most adolescents with ASD exhibited difficulties in offering a topic to initiate the conversation when given the chance. They also struggled to maintain the topic of conversation, had difficulties in adding new and relevant information to expand on the conversation topic and keeping the flow, and shifted between topics in inappropriate and unexpected ways. Participants with ASD also demonstrated issues in turn-taking during conversations: some were less responsive to cues that signalled taking a turn, others showed delays in taking turns causing hesitation and pauses, and some tended to

monopolise the conversation causing many interruptions during the conversations. In contrast, caregivers thought participants with ASD were able to start conversations with others, maintain the conversational flow, and join in conversations and take turns appropriately. Familiar routines, repetitive actions, and caregivers' support may help people with ASD achieve such behaviours and give their caregivers the impression that they have a good grasp of these conversational skills. For example, the participants with ASD in this study seemed to follow regular routines in their classrooms, which I noticed during my visits to their schools; and they were good at following their teachers' instructions and responding to their questions and requests. The teachers also used visual supports to elicit information from the adolescents with ASD; for example, when showing them a calendar, they responded by mentioning the day's date. Teachers used verbal supports as well, such as continued use of questions to maintain the students' focus and the interaction with them. These factors and their influences on the communicative performances of the adolescents with ASD could mask their actual capabilities and affect how their teachers perceive and assess their abilities.

5.4.3 Areas of difficulties according to the caregivers' perceptions but not the participants' performances

Another area of disagreement between what the participants with ASD actually did and their caregivers' ratings is in their ability to *end a conversation topic* and to *protest and express rejection*. Adolescents with ASD, according to their caregivers, are less able to perform these pragmatic behaviours than their TD peers. Adolescents with ASD, according to their caregivers, tend to act in unusual ways when they are in a situation that requires terminating an ongoing conversation; they may get angry or confused or leave without trying to end the conversation. However, in contrast to the caregivers' perceptions, adolescents with ASD showed an ability to end conversations in their actual performances; although they required more cues to do so than their TD peers. A possible reason for the difference between the results from the two sources in this study is the nature of the conversation's situation, since in the semi-structured conversation used in measuring the participants' actual performance, the situation was more stimulating to end the conversation (e.g. interrupting the participants and introducing new topic to talk about) than the situation in real life and daily communication on which the caregivers' built their assessment.

Caregivers also identified deficits in the ability of participants with ASD to express rejection or protest when offered something that they do not like. This finding contradicts the

participants' actual performances and most previous studies regarding the ability of people with ASD to protest and make requests to achieve an environmental goal, such as obtaining or refusing a particular object or action, which is easier to acquire for individual with ASD (Wetherby & Prutting, 1984; Calloway et al., 1999). Yet, although no differences were found between participants with ASD and their TD peers in expressing rejection in their actual performances, participants with ASD expressed rejection in different ways; some said "no" or "I don't want this" when they received the wrong object, while others responded atypically by shouting or getting angry or taking the desired object by force. The caregivers may have perceived these reactions or uncommon ways of showing protest as unacceptable behaviours for every day communication at home or at school and, thus, as deficits in expressing rejection.

In summary, differences were found between the findings that draw on the participants' actual performances and the perceptions of their caregivers, regarding some of the pragmatic abilities of adolescents with ASD, such as the ability to initiate, maintain, and terminate conversations; turn-taking; and protest. These differences may be related to the familiarity of the participants with their conversational partners and the environment in which the communication took place.

5.4.4 Factors influencing differences in the result

Two important factors may have had a noticeable effect on the communicative performances of adolescents with ASD in this study: the conversational partner, and the communicative environment. These two factors are widely regarded as effective elements in facilitating the pragmatic and communicative performances of some people with ASD (McHale et al., 1980; Bernard-Opitz, 1982; Tager-Flusberg & Anderson, 1991).

5.4.4.1 Conversational partner

Many researchers agree that people with autism tend to respond more frequently and appropriately when they communicate with familiar persons, such as parents, teachers or children they consider friends (McHale et al., 1980; Bernard-Opitz, 1982; Lord & Hopkins, 1986; Tager-Flusberg & Anderson, 1991). Conversational partners play an important role in the pragmatic and communicative skills of people with autism, resulting in different

responses, with different degrees of quality, with different partners (Clark & Rutter, 1981; Loveland et al., 1988).

Caregivers sometimes employ interactive behaviours to facilitate communication and develop the communication skills of their children/students/patients. For example, parents of children with autism tend use more initiation and imperative behaviours with their children, than parents of children with developmental delays or TD children, to compensate for their children's poor social and communication skills (Loveland et al., 1988). The ability of individuals with ASD to maintain conversations is also affected, to some extent, by other interlocutors involved in the conversations and the behaviours that they may follow to improve their skills. Examples of behaviours conversational partners use to help individuals with ASD in maintaining conversations include using continuous and easy questions, such as yes/no questions to avoid breakdown and keep the conversation flowing (Tager-Flusber & Anderson, 1991).

However, providing different levels of support to facilitate the communication process and accommodate the different needs of the individuals with ASD may lead their caregivers to overestimate their actual pragmatic skills (Tomasello & Mervis, 1994; Luyster et al., 2008). In the current study, the pragmatic abilities of the adolescents with ASD were assessed by their teachers at centres dedicated to people with special needs. Their teachers' role is not limited to teaching them academic skills but also includes improving their social and communication skills. Therefore, their teachers have a fair knowledge of the adolescents' abilities and have adopted certain ways to communicate with them; this may have led the teachers to be more accepting of their students' difficulties and may have caused them to overestimate their students' real abilities. The teachers also communicate with ASD students with a wide range of abilities and difficulties; this may also have affected their ratings as the teachers may have compared a participant with others in the class who have less abilities.

Therefore, the familarity of the ASD participants in this study with their cargiver (i.e., teacher or parent) may have had a positive impact on their daily behaviour, which may have led their caregiver to provide positive assessments of their pragmatic abilities, such as *topic initiation*, *topic maintenance*, and *turn-taking*, areas of difficulties identified in their actual performances, in which they interacted with me, a person they were unfamiliar with. This familiarity may also have caused an overestimation of some behaviours, which may have been wrongly interpreted as pragmatic skills and, consequently, affected the accuracy of

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diagnosis and the support provided. As a result, it is necessary to increase caregivers'
awareness of their children's actual abilities and their knowledge of how to enhance their
children's communication abilities and their support to facilitate communication.

5.4.4.2 Communicative environment

The second influencing factor on the pragmatic behaviour of individuals with autism
is the environment and the context of communication. People with ASD are reported to be
more communicative and perform better in structured situations (Tager-Flusberg &
Anderson, 1991). Participants with ASD in this study were assessed by their teachers based
on their observations of the participants and interactions with them in a classroom
environment, which is structured and controlled by the teacher, to some extent.
Communication that occurs in a classroom has artificial features, and adults (teachers) in that
context are more likely to provide help to make communication easier; for example, by
controlling turns in conversations, stimulating communication, and providing more questions
and motivation (Basil, 1992; Chiang & Carter 2008). Therefore, the classroom's structured
environment may be reflected in the performances of the adolescents with ASD; and their
interactions may seem appropriate and better than students with different levels of ability in
the classroom, which may be the reason for their positive rating in some of pragmatic
abilities. Thus, the effect of the communicative environment and the conversational partner
must be considered when measuring pragmatic skills among individuals with autism. It may
be beneficial to assess participants across different contexts and with different partners,
providing different levels of structure, familiarity, and assistance, in order to obtain a more
comprehensive understanding.

5.5 Possible Reasons for the Pragmatic Deficits of the Adolescents with ASD

Although pragmatic deficits are a hallmark of individuals with ASD (Landa, 2000;
Norbury & Bishop, 2002; Young et al., 2005, Volden, 2017) individual variations were also
found in some areas of pragmatic performance among the adolescents with ASD in this
study. Some participants with ASD demonstrated pragmatic difficulties commonly reported
in this population, such as deficits in presupposition and conversational repair, while others
performed at a level close to normal function; and no differences were found between their
pragmatic function and their TD peers in other pragmatic skills, such as requesting and
protesting. Thus, the existence of pragmatic deficits in individuals with ASD "is not an all-or-

nothing phenomenon" (Bauminger-Zviely et al., 2017, p. 1388); instead, there is heterogeneity and there are differences in the prevalence of different pragmatic difficulties among people within the autism spectrum. This variation in pragmatic functioning and the different underlying factors are central and necessary considerations for understanding the pragmatic abilities in adolescents with ASD which should be investigated in more depth in future research.

The pragmatic deficits among participants with ASD in this study may be attributed to cognitive impairments commonly reported in people with ASD, including deficits in theory of mind, executive dysfunctions, and weak central coherence (Baron-Cohen et al., 1985; Frith, 1989; Baron-Cohen, 2000; Landa, 2000; Paul et al., 2009; Lam, 2014). For example, a theory of mind deficit, in which individuals with autism do not realise that others have different mental states, knowledge, and needs, may result in the inability to maintain topics, take turns, repair communication breakdowns, add new information and expand on the topic of conversation, and provide sufficient and relevant information (Baron-Cohen et al., 1985; Landa, 2000; Paul et al., 2009). They may face difficulties inferring the needs and attitude of others in converstaional exchanges and lack sufficient understanding that they may have new information that the listener does not know (Firth, 1989; Tager-Flusber & Anderson, 1991).

Executive dysfunctions may also account for some of the pragmatic difficulties found among participants with ASD in this study. For example, the inability to exhibit self-assertion and express independence in some participants with ASD may be explained by deficits in their ability to plan and organise the requirements necessary for performing an action, especially in novel situations. Deficits in topic termination may also be related to a deficit in the executive function of inhibitive control that is commonly found among people with ASD and which helps control and stop inappropriate behaviours (Landa, 2000; 2005). Finally, the unique cognitive style of people with ASD, i.e., their tendency to notice and remember details rather than focus on a holistic view of things, may be caused by "weak central coherence", which may distract them and hinder their ability to notice and use different visual and auditory cues to complete tasks on their own, maintain conversation, and engage in conversations (Frith, 1989; Hume, 2004; De Villiers et. al, 2012).

5.6 Importance of a combined approach to measuring pragmatic skills

A number of studies have highlighted the difficulties of measuring pragmatics skills (e.g., Adams, 2002; Simmons et al., 2009; Volden et al., 2009). Pragmatic skills are related to the context of discourse and are affected by social, cultural, and cognitive factors, which make them more difficult to measure than other language skills, such as grammar or vocabulary (Adams, 2002, p. 973). Therefore, it is advised that when measuring pragmatics, information provided by others, such as parents, be complemented by observations of the performances of the participants themselves and vice versa (Condouris et al., 2003; Simmons et al., 2009). However, only few studies on individuals with ASD (to my knowledge) employ a combined approach of both direct and indirect assessment (Reichow et al., 2008; Volden & Philips, 2010; King & Palikara, 2018).

The findings from this study support the conclusion that a combined approach, using direct measures that focus on the participants themselves accompanied by indirect assessment obtained through a caregiver questionnaire, is a useful way to measure pragmatic skills and gain insight into the pragmatic abilities of adolescents with ASD (See also Adams, 2002; Condouris et al., 2003; Simmons et al., 2009). The combined approach used in this study provides empirical support of the benefits and utility of this approach in assessing pragmatic skills in ASD. First, it is beneficial in avoiding and compensating for the limitations of either one of the assessments, since the caregivers' ratings alone or the participants' behaviours alone may not represent the entire picture of the pragmatic function of the participants. Second, this approach was useful in covering the broad range of pragmatic abilities in adolescents with ASD and providing a comprehensive assessment of both their strengths and weaknesses.

5.6.1 Utility of a combined approach in the study of pragmatic skills

This study overcomes the limitations associated with direct and indirect measures and, at the same time, benefits from them by using both to measure the pragmatic skills of adolescents with ASD (See Chapter 2, Section 2.4.6 on measuring pragmatic skills). Using indirect measures in this study (the caregivers' questionnaire, PPECS) was useful in providing insight into the participants' pragmatic behaviours in their daily interactions in authentic environments (home or school); however, these ratings may have been influenced by the subjectivity of the caregivers, who may at times have overestimated the participants' abilities. The caregivers are more familiar and more experienced in dealing with adolescents with ASD, and this may have prevented them from noticing their actual function levels.

The use of direct measures of the participants' pragmatic performance, on the other hand, including semi-structured conversations in the YiPP and free conversation samples, was beneficial in highlighting the actual, contextualised, pragmatic skills of the participants. However, the performances of the participants were measured in particular situations, and their behaviours varied and fluctuated from day to day and in contact with unfamiliar adults. Using a combined approach in this study, pragmatics were measured in terms of the participants' perceived ability in their daily communication during conversations in everyday events as well as in terms of their actual use in a novel context outside their usual routine, avoiding the possible subjectivity of the raters and without the support of a familiar conversational partner.

5.6.2 A comprehensive assessment of pragmatic abilities with a combined approach

In this study, collecting data from different sources, using different tools, and both quantitative and qualitative data analysis methods highlighted the wide range of pragmatic abilities and individual differences among the participants with ASD. The combined approach also showed the impact of the assessment methods (whether direct or indirect) on the findings of participants' pragmatic function and pragmatic difficulties. The participants with ASD showed more pragmatic difficulties when their performances were measured directly compared to their indirect measure by their caregivers, who reported both weaknesses and strengths in the participants' pragmatic behaviours.

In the direct measure of their actual performances, adolescents with ASD showed deficits in most of the pragmatic behaviours under investigation (e.g., conversation initiation, turn-taking, presupposition, and conversational repair); they showed an ability to perform only some communicative functions, including making requests, protesting, and commenting with the help of cues. Whereas, according to the indirect measure of the participants' pragmatic abilities in the caregivers' reports, adolescents with ASD had pragmatic deficits in some areas, such as expressing rejection, presuppositions, and conversational repair; but they had many pragmatic skills as well, including the ability to initiate conversations, maintain interactions, join conversations, comply with social conventions, give information about feeling uncomfortable, and express emotions of happiness or being upset. The reported pragmatic skills in these areas contradict a large body of research about pragmatic abilities

among individuals with ASD (e.g., Capps et al., 1998; Hill et al., 2004; Begeer et al., 2008; Paul et al., 2014) and the results of this study participants' performances as well.

The absence of some pragmatic difficulties among participants with ASD in the study findings does not necessarily imply that they possess these abilities. It is possible that the caregivers' assessments were affected by their familiarity with the participants, which may have led them to overestimate the actual pragmatic skills of the adolescents with ASD. This possible overestimation or inaccuracy in the caregivers' assessments found in this study might be related to the study context and the caregivers of adolescents with ASD in Saudi Arabia. As reported in many previous studies, parents and teachers in Saudi Arabia are more likely to lack awareness of autism, its symptoms, causes, and the different needs of people with ASD (Almasoud, 2011; Alqahtani, 2012; Alamri & Tyler-Wood, 2016). In contrast, caregivers in Western cultures were reported as having greater awareness about autism, and the partnership approach between parents and professionals was encouraged and followed in most Western contexts (Ravindran & Myers, 2012; Ilias et al., 2018). Different cultural conceptualization about autism and knowledge of parents or care providers might have an impact on the way they perceive and understand different symptoms and behaviours related to autism and in seeking assistance, treatments, and intervention (Alqahtani, 2012; Ravindran & Myers, 2012).

In addition, as discussed earlier, supportive communication environments and familiar conversational interlocutors may positively affect communication and the performances of individuals with ASD (Tager-Flusberg & Anderson, 1991; Chiang & Carter 2008). In this study, the assessment of participants with ASD was completed by their teachers (who perceived them as possessing many pragmatic skills), based on their experience of the participants' abilities during communication and interaction with them and their peers in the school environment. Familiarity with the place (school) and with the communication partners (teachers or peers) and its positive effects on the participants' performances may be of special importance to the situation of adolescents with ASD in the Saudi context.

Parents of individuals with ASD in Saudi Arabia are more likely to avoid socialising with their children in society because of the lack of public awareness about their situation, which may cause harsh judgment of them (Mashat et al., 2014; Alsehemi et al., 2017). Therefore, most of their interactions and communication with others take place in their schools and with their teachers and school friends. As such, the school's familiar

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environment, with its daily routine and repetitive actions, and the support of their teachers, who may provide different levels of support and cues, may be beneficial in helping the adolescents with ASD to display some communicative skills. However, changing the communicative context or the communication style and introducing a new and unfamiliar situation may bring their difficulties to surface (Lim, 2018).

Nevertheless, some of the pragmatic abilities of the adolescents with ASD in this study may not only be the result of their caregivers' support or overestimation of their abilities; some of their pragmatic skills may be the result of actual changes in their development and improvements in their abilities as a result of behavioural intervention that they may undergo, which could affect and change their language use in some pragmatic aspects. However, since all of the participants in study were in the normal IQ range, it is possible that the participants with ASD used their cognitive abilities to hide their weaknesses, using strategies, such as memorising patterns of good communications (See Lim, 2018), to compensate for their pragmatic deficits; this may have affected their performances and their caregivers' assessments. Additionally, even if some adolescents with ASD have some pragmatic abilities, they used these abilities in less complex and less developed ways than their TD peers.

5.7 Summary

This chapter discussed the different pragmatic and conversational difficulties found in the conversations of adolescents with ASD compared to TD adolescents and their caregivers' perceptions of their pragmatic skills, in light of the three research hypotheses. Engaging in conversations and interactions was more challenging for the adolescents with ASD compared to their TD peers despite the variation in their pragmatic performance in this study. Adolescents with ASD in this study experienced many pragmatic difficulties, including difficulties in managing topics, which appeared in conversations with them; for example, the inability to initiate conversation topics, providing irrelevant and inappropriate comments, shifting topics suddenly without considering their conversational partner, or preserving a topic and talking about it despite its lack of relevance to the conversation topic or the interest of the conversational partner. They also showed difficulties in turn-taking and were less responsive to verbal and non-verbal cues from their conversational partner. Participants with ASD also experienced difficulties in providing the appropriate amount of information in conversations to satisfy the listener's needs, repeating information, and the inability to predict

what listeners already know and what they need to know. They also displayed difficulties in repairing conversational breakdowns or asking for clarification in cases of misunderstanding.

Research analysis revealed that some of the pragmatic difficulties of the adolescents with ASD were found only in the participants' performances (e.g., topic initiation, termination, and turn-taking); while others were only reported by their caregivers (e.g., terminating conversations and protesting behaviour). Some deficits in pragmatic behaviours, such as presupposition and conversational repair, appeared among the adolescents with ASD in this study in both the caregivers' assessments and in their actual performances. The absence of significant differences between the two groups (ASD and TD) in some pragmatic abilities was found in the caregivers' assessments, in particular, despite the many pragmatic difficulties found in the performances of the adolescents with ASD. The differences in results from the different sources of information were explained based on the effects of conversational partners and the communicative environments on the participants' pragmatic performances.

Chapter Six: Conclusion

6.1 Introduction

This study identified the features of pragmatic and conversational skills that are present in the language of adolescents with autism spectrum disorder (ASD) by comparing them with typically developing (TD) adolescents in Saudi Arabia. In order to achieve this goal, a comprehensive approach of assessment was employed, including different sources of information (the adolescents' performances and their caregivers' perceptions), as well as both quantitative and qualitative methods and tools (Yale *in-vivo* Pragmatic Protocol [YiPP]; modified Pragmatics Profile of Everyday Communication Skills in Adults [PPECS]; and discourse analysis of natural language samples). This approach was used to obtain a deep understanding of the participants' conversational behaviours and extend the discussion of pragmatic abilities in autism. Different measures of pragmatic abilities have been previously used; however, few studies employ an integrated approach to the study of pragmatic skills that includes both individuals with ASD (direct measures) and individuals who regularly interact with them (indirect measures). The combined approach employed in this study addresses this gap and provides important insights into the pragmatic abilities of adolescents with ASD. This study also addresses a significant gap in research on ASD in Saudi Arabia and the lack of tools to evaluate pragmatic competence and impairment in the Arabic language.

Previous autism research reports many pragmatic difficulties common in the population with ASD, including understanding and interpreting nonliteral language, engaging in collaborative social conversations, following conversational rules, expressing communicative functions with words, repairing conversational breakdowns, and requesting clarification (Baltaxe, 1977; Capps et al., 1998; Paul, 2001; Tager-Flusberg et al., 2005; Paul et al., 2009). Individuals with ASD also reported having problems with presuppositional skills, including differentiating between new and old information and predicting both what listeners already know and what they wish to know (Land, 2000, 2005; Young et al., 2005; Paul et al., 2014).

Other studies have also discussed the variations and heterogeneity found in the pragmatic and discourse abilities of individuals with ASD (e.g. Wetherby, 1986; Loveland et

al., 1988; Ochs & Solomon, 2004; Bauminger-Zviely et al., 2017). Few studies have reported that not all pragmatic aspects are abnormal among all individuals with ASD. As there are common pragmatic problems and weaknesses in the language of some individuals with ASD, there are also others in this population who have areas of pragmatic strengths in using some communicative functions, conversational abilities, narrative abilities, and the skills of language register (Volden & Sorenson, 2009; Bottema-Beutel & White, 2016; Brynskov et al., 2016).

The results of this study correspond with the results of earlier studies in reporting some of the common pragmatic difficulties usually found among people with ASD. Among the participants with ASD in this study, the results found difficulties in the basic aspects of conversational pragmatics (e.g., the inability to take turns appropriately and difficulties in initiating and sustaining conversations by adding new and relevant information to the conversation topic), repairing conversations, decoding presupposition, recognizing the need of the listener, and determining the appropriate amount of required information in conversational exchange. In addition, this study also agreed with some of the previous findings regarding the variations in the pragmatic performance of people with ASD. However, some findings in this study contradict the findings of previous studies in reporting pragmatic strengths in some behaviours that have usually been found to be areas of deficits and weakness among individual with ASD, such as in the ability to comply with social conventions, to express emotions, to request information and to comment (e.g. Baron-Cohen, 1988; Stone & Caro-Martinez, 1990; Tager-Flusberg, 1993; landa, 2000; Tager-Flusberg et al., 2005; Begeer et al., 2008). Nevertheless, environmental and social factors may have helped in facilitating communication with the participants with ASD, which in turn led to reports and demonstrations of these abilities in their performances or their caregivers' perceptions, such as promoted situations, verbal and non-verbal cues, familiarity with conversational partners, and supportive environments.

The study findings also add to existing knowledge about the pragmatic skills of adolescents with ASD, especially in relation to measuring and assessing pragmatic skills by employing a combined approach of both direct and indirect assessments of both their pragmatic performance and the caregiver perception of their level of pragmatic functioning. This helps in covering the broad range of pragmatic abilities in individuals with ASD and

provides a comprehensive assessment of their pragmatic abilities that highlights both their strengths and weaknesses and the variations in their pragmatic performances.

This chapter presents a summary of the key research findings and their implications for practice, the study limitations, and suggestions for future research.

6.2 Key Research Findings

The study findings provide a comprehensive profile of the pragmatic and conversational abilities of Saudi Arabian adolescents with ASD, based on an investigation of their conversational difficulties, compared to the pragmatic behaviours of TD adolescents, from two perspectives, their actual performances and their caregivers' perceptions of their skills. Using an integrated approach of assessment, which combines an assessment of what the participants actually did in their conversations and their caregivers' assessment of their conversational abilities, revealed many key findings.

First, pragmatic skills are more challenging for adolescents with ASD relative to their TD peers. An overall deficit and multiple pragmatic issues were found in the conversations of adolescents with ASD, compared to the TD adolescents, based on their performances in the semi-structured conversations and in their natural language samples as well as in the caregivers' assessments. Second, despite the overall pragmatic deficits found in participants with ASD and the different pragmatic difficulties reported, there were also variations in the pragmatic performances of the participants with ASD and a spectrum of impairments were found in both the participants' performances and in their caregivers' reports. Some areas of pragmatic strengths were also reported among the participants with ASD, especially in their caregivers' reports, where no differences were found between the two groups (ASD and TD). Third, differences were found between the findings from the assessment of participants' actual performances and their caregivers' assessments in some pragmatic skills. The caregivers tended, at times, to overestimate the participants' abilities. Possible contributors to this variation in reporting different pragmatic abilities, and variations in the participants' pragmatic abilities, may be the sensitivity of adolescents with ASD to different communicative contexts and conversational partners. Familiarity with a communicative partner and a supportive context may facilitate their communication.

Finally, the research findings contribute to the knowledge of pragmatic abilities among adolescents with ASD in Saudi Arabia. It provides a detailed account of different conversational and pragmatic abilities of Saudi adolescents with ASD compared to TD adolescents based on data collected from Saudi participants. This study also draws attention to the situations of people with ASD in the Saudi context in regard to the need to increase the knowledge base of families, teachers, and the public about autism in general and about the importance of participating in and supporting autism research. This helps to improve the study of autism and the lives of people within the autism spectrum.

Although these results might not be unique to the Saudi context, the lack of awareness among parents, teachers, and the public commonly reported in the Saudi context (e.g., Almasoud, 2011; Alqahtani, 2012; Alamri & Tyler-Wood, 2016; Alsehemi et al., 2017) may cause overestimation in the evaluation of the participants' pragmatic abilities. However, the influence of the caregivers' awareness across different cultures on the accuracy of rating pragmatic performance was not the main scope of the study. Therefore, it cannot be concluded that this potential lack of knowledge is special to the caregivers from Saudi Arabia. Further cross-cultural studies investigating the impact of caregivers' awareness from different cultures on their ability to provide reliable assessment of their children's abilities should be considered.

These findings demonstrate that overall, it is beneficial to rely on different sources of information and different assessment tools to obtain a full picture of the pragmatic skills of adolescents with ASD. Furthermore, the effect of the conversational partner and the communicative environment must be considered when measuring pragmatic skills among individuals with autism. These results also may be helpful in extending the discussion of the situation of research, services, support, and available programmes for the population with ASD in the Saudi Arabia and inform future research and the development of services there. This study also contributes to the measurement of pragmatic skills in Arabic-speaking in communities by adapting and translating tools suitable to the local culture and language, which can provide better assessment and understanding of the different pragmatic abilities of individuals with ASD in this society.

6.3 Implications for Practice

The study findings have important implications for the field of pragmatics and autism. These results may be useful in both the area of pragmatic assessment as well as in the design intervention programmes for adolescents with ASD, aimed at developing their conversational skills and social communication abilities.

6.3.1 Pragmatic assessment

This study demonstrates an effective approach to measuring pragmatic skills in adolescents with ASD. The approach used in this study can help overcome some of the limitations of pragmatic assessment found in ASD literature and practice. The combination of direct and indirect assessment tools used in this study, including a caregiver questionnaire and conversations with the participants, was designed to assess the conversational abilities of adolescents diagnosed with ASD. Use of different perspectives and different assessment tools should be considered a best practice in the assessment of the pragmatic abilities of adolescents in ASD, as it can reduce the impact of factors that affect their performance and provide a more accurate assessment of their actual pragmatic competence.

Caregivers are an essential source of information in assessing pragmatic abilities in autism and observing the strengths and weaknesses of adolescents with ASD, because they have more opportunities than others to interact with them in a variety of situations. However, the study findings show an inconsistency between the caregivers' estimation of the participant's pragmatic abilities and the abilities the adolescents demonstrated in their performances. The caregivers tended, at times, to overestimate the participants' abilities. Therefore, appropriate training, education, and support should be provided to caregivers of adolescents with ASD to increase their knowledge and awareness of their children's abilities. This could have a positive effect on assessing the abilities of adolescents with ASD, and, as a result, in developing their language, communication, and social skills. Training and engaging parents is a particularly effective approach to assisting families, especially for people with limited resources who may not have the financial means to benefit from intervention services. However, appropriate integration and balance between clinicians and families is important to the success and effectiveness of such programmes (Parsons et al., 2017).

6.3.2 Intervention programmes

The research findings may also contribute to the design of educational interventions and programmes to promote the development of the abilities of individuals with ASD. The pragmatic difficulties found in the participants' conversations (e.g., difficulties in conversational repair, turn-taking, topic initiation, and presupposition) can be used as the main elements and targets for intervention programmes directed at enhancing the conversational abilities of adolescents with autism. Conversation is an important human activity and plays an essential role in social communication. The ability to manage conversations is considered a main area of deficit among individuals with ASD (e.g., Landa, 2005; Tager-Flusberg et al., 2005). Thus, improving this ability will have a positive impact on the development of communication skills and the social life of these individuals. Furthermore, individual variations were found in the pragmatic performances of participants with ASD in this study. As such creating more personalised intervention programmes is essential to meet their needs. Utilising both the pragmatic weaknesses and strengths of individuals with ASD, for example, by taking advantage of their pragmatic abilities that already exist and using them to strengthen and develop areas in which they have of difficulties, would improve the success of these programmes.

Although programmes that focus on conversational skills are important for all individuals with ASD, at different developmental stages, they are of special importance to individuals during adolescence. Adolescence is a more demanding developmental stage that requires more advanced conversational skills, as conversation is the key medium for social engagements (e.g., moving to high school environment, developing friendships and social relations). Deficits or weaknesses in the conversational abilities of adolescents with ASD may negatively affect their ability to form positive social relationships and to be accepted by their peers, which in turn may cause serious behavioural problems and mental illness, such as depression (Koegel, 2000). The study findings, which focus on this particular age group, may be helpful for those living or working with adolescents with ASD, to understand their difficulties and thus provide them with appropriate support and services.

6.4 Study Limitations

This study has successfully achieved its main aims (i.e., gaining a comprehensive understanding of the pragmatic competencies and deficiencies of adolescents with ASD from two perspectives: their actual performance and their caregivers' ratings) and also has

implications for the field of pragmatics and autism in general. However, the study does have some limitations that should be noted and considered in future research in this field.

First, this study focuses on adolescents with ASD who have IQs within the normal range. The reason for focusing on this particular age group and cognitive ability level was because they were more likely to understand the study's different tasks, have reasonable verbal abilities, and are more able to engage in a conversations about different topics, such as friendship, that might be of interest to people in the adolescent stage. However, individuals within the autism spectrum differ widely with respect to cognitive and language abilities across different stages of development; therefore, generalisations based on the study results to other age groups and individuals with different cognitive abilities should be avoided. Future studies could follow a similar research design to examine the pragmatic abilities of different age groups (children or adults) or different function levels, for example, to explore whether these factors have an effect on the pragmatic abilities of individuals with ASD.

Second, the study sample was relatively small (n=30) due to the difficulty of finding participants with ASD who met the study inclusion criteria. The small sample size may limit the generalisability of the results. The challenge of recruiting participants with ASD is common and a major problem in many studies on autism (Whitman, 2004). Therefore, future research (ideally with larger samples) would be useful to validate the study findings and gain further insights to better understand the profile of pragmatic skills in adolescents with ASD.

Finally, the caregivers who completed the questionnaire were the teachers of the adolescents with ASD and the parents of the TD adolescents. Avoiding this methodological limitation (using different informants, teachers and parents, in caregiver assessment) was not possible, as the necessary permissions and approvals (from TD schools and the parents of adolescents with ASD) were not obtained. However, the different roles the two informant groups (parent and teachers) play in the participants' life may not have limited their ability to provide reliable ratings of the participants' pragmatic abilities. Both the teachers and the parents communicate with the participants on a (almost) daily basis and observe them in different contexts and in interaction with others (e.g., friends or family members). Furthermore, the use of different sources of information to assess the participants' abilities and not relying on the caregivers' ratings alone may have helped reduce subjective differences in the caregivers' assessments. Nevertheless, it would be beneficial in future

research to investigate the reliability of ratings from different informants (e.g., parents and teachers) compared to the ratings of similar informants (only parents or only teachers).

6.5 Recommendations for Future Research

Despite its limitations, the comprehensive assessment model used in this research is useful in providing a full picture of the pragmatic and conversational abilities of adolescents with ASD. This approach can be adopted in future research in the area of pragmatics and autism, and it may be of great benefit in providing a more accurate and comprehensive understanding of ASD than previously available. The benefits to future research of using this assessment model might include its utility in covering the wide range of pragmatic abilities and individual variations and highlighting all aspects of strengths and weaknesses in the language of individuals with ASD. It is also useful in overcoming deficiencies that can arise from the use of direct or indirect unaccompanied measures. This is because the caregivers' assessment or the evaluation of the participants' actual performance alone might not reflect the full picture of the participant's level of pragmatic function, thus negatively affecting the opportunity to provide an accurate assessment and effective intervention.

Future research should consider variation and heterogeneity in the ability of individuals with ASD as well as the possible differences between caregivers' perceptions and actual performance when measuring pragmatic skills and designing interventions for individuals with ASD. Although common pragmatic characteristics and difficulties have been reported in individuals with ASD, there are also variations in their pragmatic performance. Thus, examining the nature of this heterogeneity, its degrees, and its causes may contribute to a better understanding of pragmatic abilities and autism in general.

Future research should also consider investigating and controlling the possible effects of different factors on the pragmatic performances of individuals with ASD, which were revealed in this research. Two factors were identified as possible influences on the participants' pragmatic performance, conversational partners and communicative contexts. The effect of these factors and their influence on the pragmatic functioning of individuals with ASD should be considered in future research; for example, by collecting data from different sources (e.g., familiar vs. unfamiliar conversational partners) and in different situations (e.g., naturalistic vs. structured contexts).

Finally, this study adapted and translated western tools for the assessment of the pragmatic abilities of individuals with ASD into Arabic (the YiPP and the modified PPECS). Testing the validity and reliability of the translated Arabic versions of these tools on a larger sample would be useful in future research to study the pragmatic deficits of Arabic-speaking individuals with ASD. No standardised tools are currently available in Arabic to measure the pragmatic and communication abilities of individuals in Arabic (to my knowledge); and most of the available and commonly-used tools in the Saudi context are adapted and translated from western tools, raising concerns about their validity and reliability. Providing reliable and valid assessment tools in different languages, while incorporating the different cultures and languages structures, could contribute to improving the diagnosis and measurement of the pragmatic abilities of individuals from different communities. Better diagnosis and measurement will help clinicians and researchers develop more appropriate treatment plans and intervention programmes for individuals with ASD.

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Appendices

Appendix 1: Consent form

Bangor University's 'Code of Practice for the Assurance of
Academic Quality and Standards of Research Programmes'
(Code 03)
https://www.bangor.ac.uk/ar/main/regulations/home.htm

COLLEGE OF ARTS & HUMANITIES

Participant Consent Form

To be filled in either by students or by parents / guardians acting on behalf of students, as appropriate, and only when students have been given all of the information stated, either orally or in writing

Researcher's name …Wesam Almehmadi

The researcher named above has briefed me to my satisfaction on the research for which I have volunteered. I understand that I have the right to withdraw from the research at any point. I also understand that my rights to anonymity and confidentiality will be respected.

I agree to have the interview/discussion recorded.

Signature of participant……………………………………………………………

Date …………………………………………………………

This form will be produced in duplicate. One copy should be retained by the participant and the other by the researcher.

Appendix 2: Caregivers' Information Letter

Bangor University's 'Code of Practice for the Assurance of Academic Quality and Standards of Research Programmes' (Code 03)
https://www.bangor.ac.uk/ar/main/regulations/home.htm

COLLEGE OF ARTS & HUMANITIES

INFORMED CONSENT PARTICIPATION INFORMATION SHEET:

Pragmatic and Conversational Features of Adolescents with Autism Spectrum Disorder (ASD) in Saudi Arabia

The School of Linguistics and English Language at Bangor University requires that all persons who participate in linguistic studies give their written consent to do so. Please read the following and sign it if you agree with what it says.

I freely and voluntarily consent to be a participant in the research project entitled "Pragmatic and Conversational Features of Adolescents with Autism Spectrum Disorder (ASD) in Saudi Arabia" conducted from Bangor University, with the researcher Wesam Almehmadi. The broad goal of this research is to identify and understand the features of the pragmatics and the conversational difficulties that are present in the language of adolescents with ASD. I will be asked to fill in a questionnaire, Pragmatics Profile of Everyday Communication Skills in Adults, (PPECS) which consists of 22 items. The questionnaire should take around 10 to 15 minutes to complete. I have been told that my responses will be kept strictly confidential. I also understand that if at any time during the session I feel unable or unwilling to continue, I am free to leave without negative consequences. That is, my participation in this study is completely voluntary, and I may withdraw from this study at any time by letting the researcher know. The data may be included in journal publications, but full anonymity will be kept. I have been given the opportunity to ask questions regarding the procedure, and my

questions have been answered to my satisfaction. I have been informed that if I have any general questions about this project, or ethical issues relating to the project, I should feel free to contact Wesam Almehmadi at elp4d3@bangor.ac.uk

I have read and understand the above and consent to participate in this study. My signature is not a waiver of any legal rights. Furthermore, I understand that I will be able to keep a copy of the informed consent form for my records.

_____ _____ __

Participant's Signature   Please Print   Date

I have explained and defined in detail the research procedure in which the above-named has consented to participate. Furthermore, I will retain one copy of the informed consent form for my records.

_____

Principal Investigator Signature   Please Print   Date

This form will be produced in duplicate. One copy should be retained by the participant and the other by the researcher.

Appendix 3: Participants' (Adolescents) Information Letter

Bangor University's 'Code of Practice for the Assurance of
Academic Quality and Standards of Research Programmes'
(Code 03)
https://www.bangor.ac.uk/ar/main/regulations/home.htm

COLLEGE OF ARTS & HUMANITIES

INFORMED CONSENT PARTICIPATION INFORMATION SHEET:

This information sheet will be delivered orally or in writing, as required.

Conversational Features of Adolescents in Saudi Arabia

The School of Linguistics and English Language at Bangor University requires that all persons who participate in linguistic studies give their written consent to do so. Please read the following and sign it if you agree with what it says.

Dear Student,
My name is Wesam Almehmadi. I am a PhD student who is currently completing my degree at Bangor University.

The following information is intended to help you to decide whether you would like to take part in a research project. Before you decide whether to participate, it is important for you to understand why the project is being done and what it will involve. Please take the time to consider the following information and discuss it with relatives and friends if you wish.

What is the purpose of the study?

The project aim is to understand the conversational features in the language of adolescents in Saudi Arabia – that is, how adolescents talk.

How will information be gathered initially?

You will be asked to conduct an interview with the researcher. The interview should take around 20 to 30 minutes to complete.
Your language will be recorded and analysed for the purposes of a PhD project

Do I have to take part?

No, it is entirely up to you to decide whether or not to take part. You will only be asked to participate if you are happy that you have been given all the necessary information about the process. If you do decide to take part, you will be given this information sheet to keep and you will be asked to sign consent form. You are still free to withdraw at any time during the study without giving a reason.

What will happen if I start but then don't want to carry on with the study?

Participants may withdraw from the study at any time and their data can be removed from the study if they wish. If you decide to withdraw from the study you can tell me whether you are happy for me to use any information obtained up to that point. If you are not, any information will be destroyed and you will not be asked to participate again.

How can I obtain further information or raise a concern?

If you have any questions, comments or concerns about this research, please contact me directly at Wesam Almehmadi (elp4d3@Bangor .ac.uk) or at (00966█████).

What should I do now?

I thank you in advance for taking the time to read this letter. If you are prepared to give your permission, please read and sign the attached consent form.
Many thanks for your interest and support

I have read and understand the above and consent to participate in this study. My signature is not a waiver of any legal rights. Furthermore, I understand that I will be able to keep a copy of the informed consent form for my records.

_____ _____ _____ __
Participant's Signature   Please Print   Date

I have explained and defined in detail the research procedure in which the above-named has consented to participate. Furthermore, I will retain one copy of the informed consent form for my records.

_____
Principal Investigator Signature   Please Print   Date
This form will be produced in duplicate. One copy should be retained by the participant and the other by the researcher.

Appendix 4: Approval Letter from Bangor Ethics Committee

APPLICATION FOR APPROVAL BY RESEARCH ETHICS COMMITTEE
STUDENT RESEARCH PROJECT – DECISION

PRIFYSGOL
BANGOR
UNIVERSITY

Reference Number: CAH 37

Name of researcher:	Wesam Al-Mehmadi
Name of Ethics Officer:	Dr Thora Tenbrink
Research project title:	Pragmatic and Conversational Features of Adolescents with Autism Spectrum Disorder (ASD) in Saudi Arabia
Submission date:	27.01.16
Decision date:	12.02.16

This proposal was approved by College of Arts and Humanities Ethics Committee, Bangor University, on

Signed (on behalf of the committee) by:

Date: 12.01.16

Dr Peter Shapely

Appendix 5 : Approval Letter from Jeddah Autism Center

الجمعية الفيصلية الخيرية النسوية

مسجلة بوزارة الشؤون الإجتماعية برقم ١٩

مركز جدة للتوحد

طريقكم إلى عالنا

الـرقـم:
التاريخ:
المـوضوع:

To whom it may concern,

This letter is to certify that Jeddah Autism Center has given Mrs. Wesam Al-Mehmadi, a PhD student at Bangor University, UK, the permission to visit and collect data for her research entitled "Pragmatic and Conversational Features of Adolescents with Autism Spectrum Disorder in Saudi Arabia."

This statement was written upon the researcher`s request. Jeddah Autism Center holds no further responsibility.

Sincerely,

Amal Shaikh

Amal Shaikh, Director

Jeddah Autism Center

Appendix 6: Approval Letter from Hope Center for People with Special Needs

Kingdom of Saudi Arabia	بسم الله الرحمن الرحيم	المملكة العربية السعودية
Ministry of Social Affairs		وزارة الشؤون الاجتماعية
Umm al-Qura Charity Women in Mecca		جمعية أم القرى الخيرية النسائية بمكة
Hope Center intended for people with special needs		مركز الأمل المنشود لذوي الحاجات الخاصة

To whom it may concern,

This letter is to certify that The hope center for special needs has given Ms. Wesam Almehmadi- a PhD student at Bangor University, UK- the permission to visit and collect data for her research entitled (**Pragmatic and Conversational Features of Adolescents with Autism Spectrum Disorder (ASD) in Saudi Arabia**).

This statement was written upon the researcher's request. Hope Center holds no further responsibility.

Sincerely,

Saleha Mohammad Al-Gamdi

T/02 5402411. F/ 02 5402477. Box/ 9012   ٩٠١٢ /ص.ب. ٢٥٤٠٢٤٧٧ /ف. ٢٥٤٠٢٤١١ /ت
hope@umalqura.net /البريد الإلكتروني   www.hc.umalqura.net /الموقع

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Appendix 7: Adapted Yale *in vivo* Pragmatic Protocol (YiPP)

Yale *in vivo* Pragmatic Protocol – Administration Procedures

Material lists

1. Voice recorder (e.g., iPod, digital voice recorder, tape recorder, etc.) – This is to be unplugged, not functioning or without working batteries.
2. Box with bells or other noise maker inside
3. Two different magazines
4. Pencil (Hidden)
5. Examiner Script (Form A)
6. Scripted Verbal Cues (Form B)
7. Coding Rubric (Form C)
8. Student Questionnaire (Form D)

Environmental Arrangement

The testing room should consist of a table and chairs and a shelf to place the necessary materials. The voice recorder, magazines and questionnaires should be within reach of the examiner so that they can easily be placed on the table when needed. The box with the bells inside should be positioned on the edge of the shelf so that it can be knocked down at the appropriate time during the assessment. A pencil should be hidden so that the examiner needs to leave the table for several seconds to locate one.

Form A - Examiner Script

Examiner (E) brings Participant (P) to room.

1. E says "Ok, let's begin. What would you like to talk about?" Wait to see if P initiates topic (Initiation). If P talks about interest or hobby or any other topic, move to Behavior 2. If not, cue* and begin conversation about hobbies.

2. E says, "I have some hobbies too" (Request Information). If P asks the examiner about her hobbies, move to Behavior 3, if not, cue*.

E stops talking and says, "Oops. I forgot the tape recorder. Let me get it".

E pretends not be able to work the tape recorder (unplugged). Do not look at P or provide cues, press buttons and make comments like "Oh, no" or "Come on tape recorder!" Count to 10 to allow time for P to realize there is a problem.

3. If P provides E with an explanation as to why the recorder is not working (Hypothesizing), move to Behavior 4, if not, cue*.

E says, "Don't worry about the tape recorder. I will just take some notes. E starts a conversation.
Topic is a compare and contrast the participant's school and the examiner's school.

4. E says, "I'd like to know how the school you study in is different from the one I study in". The phrase "how the school you study in is different from the one" is rendered unintelligible by clearing throat or coughing. (Request Clarification – Muffled Speech). If participant asks for clarification, move to Behavior 5, if not, cue*.

5. Repeat the sentence, followed by "Tell me about your school." (Background Information). If off-topic response, cue*.

6. Conversation about school continues. P must comment contingently (Comment Contingently). If not, cue*.

7. E says, "Is your school small or big?" and mouth "small or big" for decreased Volume (Request Clarification – Decreased Volume). Wait for clarification request*, then repeat audibly.

8. "I have a LAB in my school (Request Clarification – Unfamiliar Acronym)." Wait for clarification request.* Tell P that LAB stands for Laboratory.

9. "The parties are always beautiful" (Presupposition – Incorrect article). Wait for recognition of incorrect article. If P says, "What parties?" Explain you always have parties in your school. If not, cue*.

10. "Our Stars are really good." (Presupposition – Need additional information). Wait for Recognition of violation of presupposition*. If P says, "What Stars?" explain that it is

a team in your school that makes some activities and competitions. If not, cue*

11. "She always introduce first part of each party." (Presupposition – Ambiguous Pronoun) Wait for recognition of ambiguous pronoun*. If P asks, "Who?" say, "Oh, I forgot to tell you: the school principal always comes to the parties and leads the first part. If not, cue*

12. "I've often wondered about that". (Request Clarification – Vague Statement) If P asks, "Wondered about what?" say, I always wondered if every school has constant parties. If not, cue*.

E introduces New Topic, "What else do you like to do for fun?". P and E should have dialog. This provides E the opportunity to attempt to take the floor.

13. E should break in by saying, "Oh! I would....". (Termination) P should stop talking and allow E to speak. If not, cue*.

14. Cue* to "break in" and change topic if P is dominating. Use if P is monopolizing conversation. If P is not monopolizing, use "Let's talk about something else…" wait to see if they query about new topic (Response to Cues to Change Speaker).

15. Observe P's ability to add information and contingently respond (Topic Maintenance). "My town's exciting in summer." Wait for P to inquire as to why. (Festivals, fairs, etc.). If no response cue*

16. E gets up to get something (Student Questionnaire – Form D) from the closet and knocks over box with a bell in it*. (Comment/Notice)

E hands questionnaire to P and asks P to complete it.

17. Don't give pencil (This gives P the opportunity to request one). (Request Object)*

18. Say you need to go get a pencil for P. Offer two stories for him to read while you're gone; give the one the P did NOT ask for (Express denial/Comment on object)*

19. Re-enter the room w/ pencil. Don't give necessary information in directions (e.g., form contains missing information) (Insufficient info)*

*Indicates point at which hierarchy of cues is given (starting with Level 4 and continuing until one of the cues elicits a response). If no response after all four levels of cue have been given, score 0.

Form B - Scripted Verbal Cues

	Behaviour	Level 4 Cue
1.	Initiation	Do you have a hobby you would like to talk about?
2.	Requesting Information	Do you want to know about my hobbies?
3.	Hypothesizing	Do you think there is something wrong with the tape recorder?
4.	Request clarification: Muffled speech	Do I need to say that more clearly?
5.	Background Information	I don't understand what you are talking about.
6.	Comment Contingently	We are talking about the schools where we study.
7.	Request clarification: Decreased volume	Would you like me to say that again?
8.	Request clarification: Unfamiliar acronym	Do you need to know what LAB means?
9.	Presupposition (statement with incorrect article)	What parties?
10.	Presupposition (need additional information)	Do you need to know what stars I am talking about?
11.	Presupposition (statement with ambiguous pronoun)	Are you wondering who introduce the first part of each party?
12.	Request Clarification: Vague statement	Do you need to know something more to answer me?
13.	Termination	Listening to me talk about [fill in blank] would be the polite thing to do.
14.	Response to cues to change speakers	Can I say something now?
15	Topic Maintenance	Would you like to know why my town is exciting in the summer?
16.	Comment/Notice	What made that noise?
17.	Request Object	Do you need something?
18.	Express Denial /Comment on Object	Did I give you the wrong magazine?
19.	Insufficient Information	Do you need directions?

Form C-Coding Rubric

Student's Name: _____	Examiner's Name: _____
Date of Assessment: _____	

	Behaviour	**Pragmatic Domain***	**Description**	**Error Score**	**Cue Score**
1.	Initiation	DM	Appropriately starts talking when adult does not.		
2.	Request Information	DM	Asks examiner for additional information		
3.	Hypothesizing	CF	Offer help or give a reason why the tape recorder is not working.		
4.	Request Clarification: muffled speech	CR	Appropriately asks for repetition or indicate misinterpretation verbally.		
5.	Background information	DM	Provides relevant background information to assist examiner's understanding		
6.	Comment Contingently	P	Provides comments relevant to the topic.		
7.	Request clarification: decreased volume	CR	Appropriately ask for repetition or indicate misinterpretation verbally.		
8.	Request Clarification: unfamiliar acronym	CR	Appropriately indicate misunderstanding verbally		
9.	Presupposition (statement with incorrect article)	P	Indicates confusion because the information (article) contained in the sentence is not known and, therefore, the sentence does not make sense to the subject.		
10.	Presupposition (need additional information)	P	Indicates confusion because the information(noun) contained in the sentence is not known and, therefore, the sentence does not make sense to the subject.		

11.	Presupposition (statement with ambiguous pronoun)	P	Indicates confusion because the information (pronoun) contained in the sentence is not known and, therefore, the sentence does not make sense to the subject.		
12.	Request Clarification	CR	Appropriately indicate misunderstanding verbally		
13.	Termination	DM	End conversation appropriately when indicated		
14.	Response to cues to change speakers	DM	Stop talking when the conversational partner attempts to take the floor		
15.	Topic Maintenance	DM	Ability to respond to the conversational partner's bids and add to the topic (for three turns)		
16.	Comment/Notice	CF	A look, sound, or comment that acknowledges the event (event marked by bell or falling blocks sound).		
17.	Request Object	CF	Appropriately requests an object needed to complete the task		
18.	Express Denial /Comment on Object	CF	Comment or deny wrong object than one requested		
19.	Insufficient Information	P	Appropriately asks for clarification of missing information on the questionnaire.		

Form D – Student Questionnaire

Student Questionnaire

Directions: Provide an orthographic response to the enumerated declaratives below.

		Yes	No
1. I enjoy taking trips.	_____	☐	○
2. I do not like being in large groups.	_____	☐	○
3. On weekends, I spend time outside.	_____	☐	○
4. I have a friend who I talk to often.	_____	☐	○
5. I enjoy in school.	_____	☐	○

THE PRAGMATICS PROFILE
of Everyday Communication Skills in Adults

Appendix 8: Adapted Pragmatics Profile of Everyday Communication Skills (PPECS, Caregivers' Questionnaire)

The Pragmatics Profile of Everyday Communication Skills
Other's- Report Version

Name…………………………………………………………

Instructions:

- ❖ Throughout the questionnaire use the adolescent name each time you see (*name*) in the text
- ❖ Choose the best answer that describe the adolescent behaviour

A. COMMUNICATIVE FUNCTIONS

1. **Attention Directing**

a) To Self
If you are busy doing something how does (*name*) usually get your attention?
- Starts talking to you.
- Calls out.
- Taps you.
- Moves closer
- Shows you something.
- Makes a noise such as tapping or knocking
- Other please specify ……………………….

b) To Events, Objects, Other People
If you and (*name*) are out somewhere and he/she sees something interesting, how does he/she point it out to you?
- Says 'look at that' and starts to talk/sign about it.
- Points.
- Pulls at you and makes sounds
- Others please specify …………………..

2. **Requesting**

a) Request for Assistance
If (*name*) needs help with something he / she is doing, how does he / she usually let you know?

- Asks for help and explains what is needed.
- Hints (says something like 'this is heavy').
- Comes up to you and shows what is needed.
- Calls out but does not explain the problem.
- Gets angry and distressed without asking for help.
- Just waits
- Other please specify …………………

b) Request for Information

If (*name*) needs to find out what is planned, for example for the day or for the weekend, how does he / she go about it?

- Asks you directly.
- Points to calendar / diary.
- Waits to be told
- Other please specify ……………….

3. Rejecting

If you offer (*name*) something to eat or drink that he / she doesn't want, what does he / she usually do?

- Says / Signs "No thanks".
- Asks for something else.
- Shakes head / gestures with hand.
- Pushes it away / turns head away.
- Other please specify ……………………

4. Expression of Emotion

a) Pleasure

If (*name*) is really pleased about something how does he / she let people know?

- Tells them how he / she feels.
- Smiles or laughs.
- Hugs or claps.
- Keeps it to him/herself
- Other please specify ………………

b) Upset

If (*name*) is hurt or upset about something, how does he / she usually show it?

- Explains how he / she feels and why.
- Cries to let others know he / she is upset.
- Becomes withdrawn.
- Gets moody and irritable.

- Other…………………..

5. Self-Assertion

If you offer to help (*name*) to do something but he / she wants to do it without help, how does he / she let you know?

- Says he / she can manage.
- Gestures you away.
- Gets angry with you.
- Puts up with being helped.
- Other please specify ……………………

6. Giving Information

a) If something happens that you aren't aware of and (*name*) wants to let you know about it, how does he / she go about it? (For instance, if someone visited or something got broken)
- Tells you all about it.
- Tries but the message gets muddled.
- Indicates with gesture.
- Often forgets to tell.
- Doesn't attempt to tell.
- Other please specify ………………

b) If (*name*) is feeling unwell or uncomfortable, how does he / she let you know?
- Tells you what's wrong.
- Responds when questioned.
- Indicates by body movements or facial expression.
- Becomes quiet and withdrawn.
- Other please specify ……………………….

7. Narrative: Telling Stories and Jokes

If (*name*) wants to tell you a story or a joke, what usually happens?
- Tells it in as interesting a way as possible.
- Gives too much detail.
- Gives too little information so it is hard to follow.
- Forgets the point or the punchline.
- Keeps telling the same story.
- Doesn't try to tell jokes or stories
- Other please specify ……………….

B. INTERACTION AND CONVERSATION

8. Initiation

When (*name*) wants to start up a conversation with someone, what does he / she generally do?

- Makes eye contact.
- Asks how they are.
- Comments on something like the weather.
- Asks their opinion on something.
- Asks a personal question.
- Launches into a topic.
- Doesn't start up a conversation
- Other please specify …………

9. Maintaining an Interaction or Conversation

a) When you are chatting with (*name*), how does the conversation flow?
- You take equal shares.
- He / she plays a minimal part.
- He / she monopolizes.
- It jumps from topic to topic.
- Conversations are short-lived.
- You find it hard to understand one another.
- Other please specify …………..

b) When you are chatting with (*name*), are there things he / she does which interfere with the flow of the conversation?
- Takes a long time over saying what he / she wants to say. Takes a long time to get started on an answer.
- Gives very short replies.
- Interrupts when other people are talking.
- Chatters on without giving the other person a chance. Shifts from topic to topic.
- Keeps on talking about a particular topic.
- Other please specify ……………

10. Presupposition and Shared Knowledge

When (*name*) is talking about something you don't know about, how clearly does he / she put you in the picture?

- Explains everything fully.
- Doesn't give enough information to help you understand.
- Assumes too much about what you know or who you know.
- Gives too much detail.
- Other please specify …………..

11. Conversational Repair

If you ask (*name*) to clarify something he / she has said that you haven't understood, what does he / she usually do?

- Gives information which helps you understand.
- Responds when questioned.
- Repeats it.
- Finds it difficult to say more to make it clear.
- Clams up.
- Gets cross
- Other please specify …………..

12. Overhearing Conversation

If you are having a conversation with some other person and (*name*) is in the room but not included, how does he / she generally react?

- Asks what you are saying.
- Tries to get you to notice and include him / her.
- Gets angry or upset.
- Doesn't seem to mind.
- Seems to think that you are talking about him / her.
- Takes no notice.
- Other please specify …………..

13. Joining a Conversation

If (*name*) wants to join in a conversation that others are having, how does he / she go about it?

- Waits for a gap and makes a relevant comment.
- Signals that he / she has something to say.
- Tends to barge in.
- Doesn't try to join in.
- Other please specify …………..

14. Terminating a Conversation

How does (*name*) generally bring a conversation to an end?
- Brings it to a mutual conclusion.
- Keeps on going till other person ends it.
- Gets distracted.
- Stops it abruptly, for example, by walking off.
- Other please specify …………..

15. Compliance with Social Conventions

Are there things (*name*) sometimes does that are different from the things people usually do when they are talking to other people?
- Acting as people usually do
- Talks to him / herself.
- Talks overmuch.
- Interrupts others.
- Asks the same question repeatedly.
- Tends to stand too close.
- Speaks too loudly.
- Makes personal remarks.
- Asks over-personal questions.
- Tends not to look at the other person.
- Other please specify …………..

16. Interactant's Reactions

a) When (*name*) is having a conversation, are there particular things the other person can do that make it easier for him / her to keep up the conversation?
- Talk more loudly / slowly.
- Use simpler language.
- Give prompts.
- Make sure he / she can see the speaker.
- Other please specify …………..

b) How do you tend to feel when you are having a conversation with (*name)*?
- Feel comfortable and familiar.
- Feel uncomfortable.
- Feel unsure how to react.
- Get irritated.
- Feel uneasy or threatened.
- Other please specify…………