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Clinical Assessment of Pragmatics (CAPs): A Validation Study

by

Adriana Lavi

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A Dissertation submitted in partial satisfaction of
the requirements for the degree
Doctor of Philosophy in Rehabilitation Science

————————————————

June 2016

Each person whose signature appears below certifies that this dissertation in his/her opinion is adequate, in scope and quality, as a dissertation for the degree Doctor of Philosophy.

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ABBREVIATIONS

CAPs	Clinical Assessment of Pragmatics
HFA	High Functioning Autism
SLI	Specific Language Impairment
PL	Pragmatic Language
PLI	Pragmatic Language Impairment
ToM	Theory of Mind
CASL	Clinical Assessment of Spoken Language
TOPL	Test of Pragmatic Language
IPA	Instrumental Performance Appraisal
SCA	Social Context Appraisal
PD	Paralinguistic Decoding
IP	Instrumental Performance
AE	Affective Expression
PC	Paralinguistic Codes

ABSTRACT OF THE DISSERTATION

Clinical Assessment of Pragmatics (CAPs): A Validation Study and
An Analysis of Pragmatic Language Profiles in Adolescent Students.

by

Adriana Lavi

Doctor of Philosophy, Graduate Program in Rehabilitation Science
School of Allied Health Professions
Loma Linda University, June 2016
Karen J. Mainess Ph.D., Chairperson

The purpose of this study was bi-fold: to develop and analyze the validity and

reliability of a comprehensive pragmatic language diagnostic tool, the Clinical

Assessment of Pragmatics as well as comparatively examine and analyze pragmatic

language profiles of three groups of adolescents. These included students with Language

Impairment (LI), High-Functioning Autism (HFA) and typically developing students.

During the validation phase of the study, thirty participants, ages 14 to 16 years old, were

administered 3 pragmatic judgment and 3 pragmatic performance subtests comprised of

10 items each for a total of 60 test items. A series of validity and reliability measures

were employed for the purpose of validating target diagnostic tool. During the second

part of this study, one hundred and twenty participants, ages 14 to 16 years old, were

administered the CAPs to comparatively analyze their receptive and expressive pragmatic

language performance.

Study results revealed that this instrument provides a valid and reliable comprehensive

measure of pragmatic language skills. Both test-retest and interrater reliability were found

to be strong. Experts rated the CAPs highly for both content and clarity. Concurrent

validity was obtained on three of the CAPs subtests and was found to correlate to three

existing pragmatic language instruments and measures (the Clinical Assessment of Spoken Language – Pragmatic Judgement subtest, the Test of Pragmatic Language and the Social Language Development Test, adolescent). Further, the results revealed significant differences among all groups of students on expressive and receptive pragmatic language tasks. Students with HFA and SLI demonstrated adequate performances on instrumental pragmatic language tasks. However, they had significant difficulties on higher order pragmatics such as perceiving irony, sarcasm, and expressing sorrow or support. Furthermore, the HFA group was distinguished by profound deficits in students' ability to recognize and appropriately use facial expressions. CAPs is a tool which is both valid and reliable and can be used as a means of determining whether school-aged students present with deficits in pragmatic language skills, specifically, high-functioning autism or specific language impairment.

CHAPTER ONE

INTRODUCTION

The work to follow will address the topic of social language impairments related to high functioning autism in adolescents and means by which speech-language pathologists can be better-capable of diagnosing this condition, which often manifests as an impairment of pragmatic language skills. The current methodologies which are employed by speech-language pathologists and others who work with children with pragmatic language impairments are limited. Recent evidence indicates that rates of autism are on the rise in the United States, with a factor which has increased the need for educators and speech language pathologists to provide diagnostic and therapeutic services in the area of pragmatic language. To this end, this work will explore an innovative way by which such an assessment can be made. This work will explore the current methods, as well as investigate the use of a *video-based assessment tool of* pragmatic language impairments.

The first section will detail a validity and reliability study of a comprehensive pragmatic language diagnostic tool known as the Clinical Assessment of Pragmatics (CAPs). Through this exploration, this work will identify strengths and deficiencies of the CAPs, particularly shown with regard to the technical aspects of this assessment tool which may preclude its effective use by speech language pathologists. The second part of this work will explore the use of the *video-based* CAPs test reflecting the pragmatic language profiles of three groups of adolescent students. This test will be shown to be as effective a means of identifying students with potential pragmatic language difficulties and autism as the current assessment tools. The advantages that will be shown to be

derived from this video-based assessment tool include those of diagnostic accuracy, comprehensive inventory of elicited pragmatic language skills and expediency – as this tool can be administered efficiently. While this means that they also carry the same potential for drawbacks as the conventional assessments, evidence shows that they are a highly-viable means by which children can be assessed for pragmatic language impairments. In addition to this video-based assessment providing a reliable and valid means of assessment, this tools can also be 'friendlier' with respect to the students it aims to assess.

It is this consideration of CAPs, a video-based assessment tool, which will form the centerpiece of this work. While it was necessary to begin with a consideration of the validity of CAPs, this work aims to show that this video-based assessment is just as effective as current tests of pragmatic language and socialization impairments. In addition, this work aims to show that there is more potential in the use of video-based tools for not only the *identification* of pragmatic language impairment associated with high functioning autism spectrum disorder, but also language impairment. Finally, this work will demonstrate that there is great potential in the use of video-based assessment tools as they will be shown to be effective and reliable.

CHAPTER TWO

CLINICAL ASSESSMENT OF PRAGMATICS (CAPS): A VALIDATION STUDY OF A VIDEO-BASED TEST OF PRAGMATIC LANGUAGE IN ADOLESCENT STUDENTS

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Abstract

Pragmatic language impairment is a communication disorder which often coexists in individual diagnosed with autism spectrum disorders and/or individuals with language impairments. Pragmatic language impairments are affecting an increasing number of students in the United States and around the world. A major issue with undiagnosed pragmatic language impairment is that it may cause serious academic failures, unsuccessful socialization with peers and adults or reluctance to communicate at all. Researchers and practitioners have long argued of the scarce availability of comprehensive standardized measures of social-pragmatic communication deficits as well as of the need to develop pragmatic language assessments that target the unique social language characteristics of students with high functioning autism and pragmatic language impairment such as higher level language comprehension, inferential thinking and understanding the mind of others. The purpose of this study was to develop and analyze the validity and reliability of a novel video-based approach to assessing pragmatic language, namely the Clinical Assessment of Pragmatics (CAPs). This study included thirty students with Specific Language Impairment, High-Functioning Autism and typically developing students. Expert opinion was solicited for the purpose of obtaining content validity. Study results revealed that this instrument provides a valid and reliable comprehensive measure of pragmatic language skills. Both test-retest and interrater reliability were found to be strong. Experts rated the CAPs highly for both content and clarity. Concurrent validity was obtained on three of the CAPs subtests and was found to correlate to three existing pragmatic language instruments and measures (the Clinical Assessment of Spoken Language – Pragmatic Judgement subtest, the Test of

Pragmatic Language and the Social Language Development Test, adolescent). CAPs is a tool which is both valid and reliable and can be used as a means of determining whether school-aged students present with deficits in pragmatic language skills, specifically, high-functioning autism or specific language impairment.

Key Words: pragmatic language, assessment, high functioning autism, specific language delay

Pragmatic Language and Pragmatic Language Impairment

Social pragmatic communication impairments related to Autism (ASD) and Specific Language Impairment (SLI) are becoming an academic and social reality for an increasing number of children in the United States and around the world. According to the US Department of Education's census summary statistics for 2003, there was a 600% increase in the number of students found eligible under the category of Autism. Prior to the 1990s, one in 2000 children was diagnosed with ASD; however, in the mid-2000s the number had increased to one in 150 children [1]. Current Center for Disease Control (CDC) findings report prevalence rates of one in 110 females and one in 70 males or about 1% [1].

The ability to communicate effectively and develop appropriate receptive-expressive pragmatic language skills is an overarching goal for all children with ASD and SLI. Speech language pathologists (SLPs) play a critical and direct role in the development of effective communication in children and adolescents with pragmatic language impairments. Because speech language pathologists work most directly with this target population (SLI and HFA), they are best qualified to remediate the difficulties these children exhibit in their pragmatic abilities. It is the SLPs' job to ensure that the individuals served have the social pragmatic language foundation that will allow effective communication to develop, as it is the basis for success in school.

Pragmatic language binds together semantics, morphology, syntax, overall language comprehension and oral expression to make effective communication occur. It is the final element needed for appropriate and effective communication to take place. Any deficit in pragmatics results in significant disruption in the communication process

[2]. Hymes (1971) simply defines pragmatics as a student knowing when to say what to whom and how much [3]. This may seem somewhat simplistic, but others offer more elaborate descriptions. Prutting and Kurchner (1987) define pragmatic language as the ability to use language in specific contexts and for specific purposes [4]. Grice (1975); Mundy & Mascus (1997) make a useful contribution in pointing out that it is impossible to declare what pragmatic language is without using culture as a context [5, 6]. It is a student's very subjective experience with social language that informs him or her when a speaker is being sarcastic, making an attempt at humor, or is unnecessarily formal, polite or even hostile.

A broad array of linguistic skills works cohesively to produce pragmatic language. These include appropriate turn-taking, politeness, proper introduction of a topic, stylistic variations to be adjusted for different listeners, and topic maintenance and changes in direction or intention. In addition, proper eye-contact and gaze, body language, micro expressions of the face, gestures and other forms of non-verbal language are all integral components of pragmatic language [4]. Nicolosi, Harryman & Kresheck (1996) agree as well, that without context, any attempt at effective pragmatic language is virtually useless [7]. The environment that generates the language gives context to what is communicated and is invaluable. The intention of the speaker and the sensory-motor actions used to deliver what is said are pivotal. Knowledge shared in a communication dyad is to be considered by speaker and listener alike, but the context changes and shifts even further if we move from a dyad to a speaker in a group setting. The authors see meaning to be as important as the context since they are the result of well-intentioned and creative combinations of utterances and social settings. Therefore, meanings and contexts

are considered inseparable. Loukusa et al. (2006), suggests that the context can be taken as far as knowing the identity of the speaker and listener in addition to determining the speaker's intention in his or her selection of sentences used to convey meaning [8]. Pragmatic language deficits translate into difficulty correctly comprehending and expressively responding to situations in a social context. Individuals with deficits in pragmatics primarily struggle during conversation with others both receptively and expressively.

High Functioning Autism

Individuals with Autism Spectrum Disorder (HFA) demonstrate a number of deficits relating to speech and language, ranging from nonverbal to those with high verbal ability who demonstrate weaknesses in pragmatic language skills [9]. These deficits are prevalent in individuals across the spectrum, including those with high functioning autism and Asperger's Syndrome. HFA is a pervasive developmental disorder that occurs across all socioeconomic groups. Although a definite cause is unknown, individuals with autism are characterized largely by three attributes: impairments in social interaction, behavior, and communication.

The DSM-V (2013) defines HFA symptomatology as manifesting difficulties in social communication and social interaction, restrictive, repetitive patterns of behavior, interests or activity that are present in the developmental period [10]. It also causes significant impairment in the social, occupational, or other important domains. These characteristics cannot be attributed to an intellectual disability or developmental disorder. Those with high functioning autism (HFA) share similarities with those with classic

autism; both groups have delays in language acquisition and impairments in communication, social interaction, and have restricted and stereotyped patterns of behavior [11]. A major difference between those with HFA and classic autism is cognitive ability. Those with HFA have average to superior intellectual ability, however, difficulty with pragmatic or language in a social context continues to be an area of weakness. Statements are often taken literally and abstract language can be difficult to comprehend. Additionally, difficulty changing topics and dominating a conversation are often observed. Because these individuals have difficulty understanding other's perspectives, they may fixate on an area of interest which could progress into an inability to take turns in a conversation ultimately impacting the ability to relate to others [12].

Another distinctive characteristic of autism, difficulty understanding others' perspective, also known as Theory of Mind (ToM) is also evident in an HFA profile [13]. Scheeren et al. describe ToM as the ability to attribute various mental states or feelings to others as well as offer an explanation as to why a person may behave in a particular way as a result of that mental state [13]. They assert that children with ASD tend to have limited ability in understanding others thoughts and behaviors. Whyte, Nelson, and Scherf (2014) purport that ToM abilities are assessed by basic aspects of language development that is often delayed in individuals with ASD [14]. Happe (1993) found that individuals with ASD who failed all ToM tasks possess the ability to explain similes on a literal or surface level [15]. They were lacking in the ability comprehend metaphors or irony, or non-literal language.

Research shows that a typical developing three to five year old possess basic pragmatic skills such as directing their attention to the speaker, taking turns in

conversation, making requests, asking and answering questions, and are beginning to understand more abstract language [16]. Children with HFA are less able to initiate conversation, take turns during conversation, speak on others' interests, ask relevant questions, and appropriately end a conversation. Bauminger-Zviely et al. found that children with HFA had less pragmatic abilities in many realms than the typically developing group [16]. More specifically, those with HFA had more difficulty with verbal behaviors such as turn taking, prosody, and inability to respond to cues. Also demonstrated were weaknesses in nonverbal social-gestures behaviors such as facial affect and eye contact.

Asperger's Syndrome

Individuals with Asperger's Syndrome (AS) function at the higher end of the autism spectrum. Incidence rates are not as well established. The Genetics Home Reference estimates prevalence to range from 1 in 250 to 1 in 5,000, occurring three to four times more frequently in males than females [17]. These individuals also have deficits in pragmatic language, impaired social interaction, restricted and repetitive patterns of behavior and interests, and sometimes include impaired gross motor skills. A difference between those with AS and autism is that there is no delay in cognitive or speech development [18] and later onset of symptoms [19]. These individuals often have average to superior verbal ability; however the use of their language in conversation tends to be awkward or involve extraneous language. Additionally, HFA involves the left hemisphere of the brain; on the contrary, AS involves the right hemisphere [19]. Martin and McDonald (2003) note that individuals with AS have the verbal skills to engage in

conversation, nevertheless still have difficulty engaging in cohesive social

communication [20]. Typical difficulties for individuals with AS include verbosity,

specific and peculiar use of language, fixation on certain topics, and difficulty

comprehending others' perspectives and abstract language. Individuals with AS had more

difficulty with pragmatically problematic responses and social-emotional questions than

with factual questions when compared to the control group.

Like individuals with HFA, individuals with AS have difficulties with Theory of

Mind (ToM) and central coherence. Deficits in ToM, can in turn, result in insensitivity to

feelings of others, also a social skills deficit [19].

Along with high structure and accommodations and/or modifications in

academics, individuals with AS need systematic social skills and pragmatic training

coupled with social mentoring in order to be successful [21]. Martin and McDonald

(2003) stress the importance of social communication skills in order to benefit in

contemporary society [20]. They further emphasize that not only is understanding the

nature of the impairment necessary, but also the causes so that appropriate intervention

and therapy can be developed. Norbury, Nash, Baird, and Bishop (2004) developed the

Children's Communication Checklist (CCC), a measure that assesses pragmatic language

skills [22]. The checklist is categorized into five scales, (1) assessing inappropriate

initiation, (2) coherence, (3) stereotyped language, (4) use of context, and (5) rapport

which scores comprise the Pragmatic Composite. Individuals with AS had an

intermediate Pragmatic Composite score which were aligned with those who presented

with symptoms of autism and had scores within the low range. Additionally, a separate

study found that in a comparison between individuals with AS and HFA, those with AS

used more unclear references in conversation as opposed to individuals with HFA who made unexpected or unrelated and fewer references [23].

Specific Language Impairment

A Specific Language Impairment (SLI) is characterized by a delay in language skills that cannot be attributed to intellectual disability, neurological disorders, chromosomal syndromes, or hearing impairment [24]. The National Institute on Deafness and Other Communication Disorders (NIDCD) estimates SLI occurrence to be seven to eight percent of children in kindergarten [25]. According to the DSM-V, SLI falls under the broad umbrella of mixed receptive-expressive language disorder or expressive language disorder. Deficits in receptive language translate to inability to accurately comprehend what is being said and understanding social situations. Expressive language disorders are characterized by difficulties with language output, appropriately expressing oneself in a social situation. Similar to those with AS, these individuals may have high cognitive as well as verbal abilities. Individuals with SLI may have difficulty with vocabulary, grammar, conversational skills, and with the acquisition of particular morphemes, and complex language skills such as narrative organization and discourse comprehension. Amongst individuals identified with Speech and Language Impairment is a subgroup of individuals with pragmatic language deficits. The DSM-V, now categorizes this as a Social Communication Disorder. These deficits translate into difficulty correctly comprehending and expressively responding to situations in a social context. Individuals with deficits in pragmatics primarily struggle during conversation with others both receptively and expressively. Common difficulties include providing

inappropriate responses, asking or not asking appropriate questions, taking turns during conversation, making eye contact and making appropriate facial expressions or gestures, and smoothly transitioning from one topic to another.

Ryder and Leinonen (2014) questioned children on a storybook with pictures and short verbal scenarios; both in which answers required the children to make inferences [26]. Results indicated that all groups, those with SLI including a subgroup of pragmatic language deficits and typically developing children correctly answered more items when presented the storybook with pictures. Overall, on both the storybook and short scenario task, those with pragmatic language deficits provided irrelevant answers, thereby answering more questions incorrectly. The authors noted that providing irrelevant answers implies that the children with pragmatic language deficits demonstrated an inability to integrate contextual information to a meaningful overview. In addition, children with SLI and pragmatic language deficits also face difficulties in peer relations. Mok, Pickles, Durkin, and Conti-Ramsden (2014) conducted a study to examine the developmental trajectories of children with SLI over a nine year period [27]. Results indicated that individuals with SLI and deficits in pragmatic language were at a higher risk for having poor peer relations.

Current Pragmatic Assessments Tools

Several studies focus on the treatment of pragmatic language impairments. However, few reflect research which is based on the assessment of pragmatic deficits [28, 29]. Reasons for this divergence are partly due to there being few pragmatic tools to measure these deficits. Few formal assessment tools for speech-language pathologists are

available that can be regarded as standardized measures of social-pragmatic communication deficits. Some practitioners have gone on record as saying that an effective, standardized instrument may never be developed [30]. The pessimism is palpable for several reasons. First, a number of variables would need to be measured by any instrument alleging to accurately measure the full gamut of pragmatic language. The prosody of students with Asperger's Syndrome alone is typically odd [31]. These students interpret implied meanings literally [31]. There are non-verbal cues missed and communication problems that arise from a limited or inappropriate use of gestures, clumsy body language, inappropriate facial expressions and difficulty reading physical expressions [31]. With such a long list of variables that must be measured, normed, and standardized, the exercise of creating a useful instrument to measure pragmatic language is a deemed a daunting task.

On the other hand, there are few instruments that attest to providing some type of assessment of pragmatic language skills. Current assessments utilize pictorial contexts to assess pragmatic language skills and subsequently use these results to develop strategies to assist with these deficits [31]. Presently, assessments incorporating real life video role plays pertaining to real life contexts as opposed to picture scenarios are non-existent.

A commonly used instrument by speech language pathologists is the Test of Pragmatic Language (TOPL) [32]. The TOPL uses pictures of various social situations requiring students to demonstrate pragmatic judgment by giving an appropriate response. The response pattern is a dichotomous one in which the child's response is scored as correct or incorrect.

Volden and Phillip (2010) found multiple shortcomings of the assessment in measuring pragmatic language skills in individuals with autism spectrum disorders (ASD) [33]. The authors note that a standardized test such as the TOPL, because of the rigidity in which it is administered, does not reflect the individual's ability to adjust to different contexts. The administration of a test captures only one snapshot of the individual's abilities; the deficit may or may not be observed during this period. In a study conducted by Young et al. (2005), results indicated that the TOPL was not always successful in distinguishing individuals with ASD from the control group [34]. In general, those with ASD performed lower than their typical developing peers, however, because variation among their scores was so great, it was concluded that the TOPL might not always succeed in identifying individuals with HFA or pragmatic language deficits from their typical developing peers. The authors note that because the TOPL focuses more on measuring pragmatic language skills that develop during the course of typical development, it fails to identify impairments associated with ASD. Additionally, because the TOPL is scored as either a "correct" or "incorrect" answer, the quality of the individual's response is not taken into account. Young et al. (2005) also suggests that the dichotomous scoring system is limiting in that the quality of a student's response does not factor in the scoring [34]. The test is also narrow in scope and not comprehensive enough to measure a wide range of social pragmatic skills other than pragmatic judgment. Finally, the TOPL is not sensitive enough to differentiate higher level skills which are typical of more sophisticated learners. The test is more effective when students function on the lower end of the pragmatic scale but is unable to detect subtle differences on the higher end of the spectrum [34]. The TOPL, in summary, does not always accurately

measure deficits in high functioning individuals, which in turn, does not allow for proper

intervention.

Similarly, another measure of pragmatic language is the Clinical Assessment of

Spoken Language (CASL) [35]. The CASL includes a subtest called Pragmatic Judgment

that assesses the individual's knowledge and use of pragmatic language rules and

judgment of their appropriate application. After a short vignette is read aloud, the subject

is required to judge the appropriateness of the language used and also to provide the

appropriate language for the situation. Subtests are not expressive in nature; rather

students are assessed mainly in receptive areas. Researchers' observation and experience

regarding the administration of this subtest has shown that high functioning students with

autism are unlikely to have much differentiation in performance from their non-disabled

peers and score consistently high on this subtest [36]. This is an indication that the

instrument is not sensitive enough to identify pragmatic deficits in children with HFA.

Pragmatic Checklists and Profiles

Questionnaires, checklists and profiles also measure pragmatic skills. What

follows is not an exhaustive list of these instruments however, none of them provide a

point of reference that allows a clinician to determine whether scores are indicative of

deficits or strengths in pragmatic areas (Table 1).

Table 1. Questionnaires, Checklists, and Profiles which measure Pragmatic Skills

NAME	Author, Year
Communication Effectiveness Profile	Warner , 2007 [37]
Dore's Conversational Acts	Stickler, 1987 [38]
Tough's Functions of Language	Tough, 1977 [39]
Fey's Pragmatic Patterns	Fey, 1986 [40]
Prutting Pragmatic Protocol	Prutting and Kirchner, 1983 [4]
Communicative Partner Profile	Anderson-Wood & Smith, 2000 [41]
Muir's Informal Assessment for Social Communication Skills	Muir, Tanner, & France, 1992 [42]
Halliday's Functions of Language	Miller, 1981 [43]
Pragmatic Rating Scale	Anderson-Wood & Smith, 2000 [41]
Interaction Record	Anderson-Wood & Smith, 2000 [41]

Instrumentation

Pragmatic Judgment versus Pragmatic Performance

To this date, pragmatic judgment has been broadly defined as general pragmatic language skills. This study aims to redefine pragmatic judgment and thereby create two broad constructs under the realm of pragmatic language skills: Pragmatic Judgment (PJ) and Pragmatic Performance (PP). The definition as well as the importance of both PJ and PP will be discussed. Furthermore, new constructs are developed in efforts to measure both PJ and PP skills in a comprehensive assessment. Pragmatic Judgment is a broad construct used to measure pragmatic language skills. Pragmatic judgment is measured by the ability of an individual to appropriately understand and use appropriate language [26]. This requires the individual to form appropriate social language responses such as saying the appropriate response at the right time in a given social context. Developing skills in this area is critical as it involves being able to engage in relevant topics during

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conversation, providing relevant information when asked questions, appropriately taking turns in conversation, and responding appropriately to other individuals in regard to gender, status, age, and using the appropriate language that corresponds to specific feelings such as gratitude, excitement, and sorrow [44]. Receptively, this can mean identifying correct and incorrect responses in a social context. Expressively, this involves verbally providing appropriate responses in a given situation.

For the purposes of this study, PJ will be related to receptive pragmatic skills. Defining PJ as equivalent to receptive pragmatic skills and distinguishing it from a broad definition of pragmatic language skills will allow a more detailed grasp of an individual's ability to understand social situations. This is measured by how the individual perceives what correct and incorrect responses in various social contexts are. For example, the individual will be presented a social situation with a response that is made; the individual will then identify whether the response made was a "right" or "wrong" response given the context. PJ can also be measured by having individuals identify an appropriate response when given several choices.

Pragmatic Performance: Assessing appropriate responses is necessary as it pertains to daily life skills. Additionally, assessment can aid in the identification of strengths and weaknesses in students with pragmatic disabilities which often include those with HFA, AS, or SLI. Pragmatic Performance (PP) is defined as congruent to an individual's expressive pragmatic skills. This is measured through the response given in social situations. Responses vary to include appropriate answers to questions or statements and appropriate responses to expressed emotions. The purpose of this study is to measure both PJ and PP skills in individuals with HFA, AS, and SLI. Aside from the

CASL and TOPL, which can be vague in distinguishing between PJ and PP skills, assessments that measure and distinguish between both types are skills are relatively scarce. Assessment of both skills is important as each individual with HFA, AS, and SLI has different language profiles; one may have more developed judgment skills than performance skills or vice versa. Measuring both skills can a more detailed approach to understanding the pragmatic profiles of these individuals, which in turn results in a more individualized and effective intervention plan.

Instrumental versus Non-Instrumental Communicative Intent

In addition to assessing PJ and PP skills, this study will differentiate pragmatic language skills as either instrumental or affective, non-instrumental communication. In instrumental communication (IC), the primary goal is to relay information effectively and where communication is used as a means to an end. Focus is heavily emphasized on what is being said as opposed to affective or emotional functions [45]. Because difficulty understanding others' emotions and perspective is a highlighted characteristic in individuals with ASD and SLI, instrumental communication is often used. This study analyzes how individuals with HFA, AS, and SLI use instrumental communication and how it pertains to pragmatic language skills.

Non-Instrumental Communication (NIC) or affective communication involves higher level communication skills such as expressing emotions such as joy or sorrow to another person. NIC is a key component of nonverbal communication and also requires higher level thought processing. It differs from IC in that it is not used merely as a means

to an end [45]. NIC can be viewed as a pertinent construct in assessing pragmatic language skills as its use demonstrates aptitude in both PJ and PP skills.

Clinical Assessment of Pragmatics (CAPs)

The CAPs is a diagnostic tool designed to assess pragmatic language skills in students, ages 14 to 16 years old. It includes a total of 6 subtests which assess the following:

Pragmatic Judgment

Instrumental Performance Appraisal

Instrumental Performance Appraisal examines the ability to judge appropriateness of introductions, farewells, politeness, making requests, responding to gratitude, requesting help, answering phone calls, requesting information (e.g., directions), and asking for permission, given a specific scenario. In other words, can an individual discern the difference between appropriate and inappropriate language when used in means-end or basic communication processes. This includes, but is not limited to introductions, farewells, politeness, making requests, responding to gratitude, and requesting information. These skills are necessary to satisfy an individual's basic needs and behave appropriately in social situations and can be measured through the subject's ability to choose correct responses to basic or functional communication processes. For example, a student is shown multiple video clips and is asked to choose the one that correctly demonstrates what should be said when asking for a drink.

Learning to distinguish correct behaviors from the incorrect will consequently result in acting out the correct behaviors. Research using Picture Exchange Communication Systems (PECS) [46] as a means to teaching functional communication has produced effective results in the acquisition and improvement of function skills [47]. Acar and Diken (2012) reviewed studies where video modeling was used as a teaching method for students with autism [48]. Results conclusively found that videos were also effective in teaching social skills, play skills, language and communication skills, functional skills, self-care skills, and daily life skills to children with autism. This study will branch out further, assessing multiple constructs of pragmatic language using video role plays.

Social Context Appraisal

Social Context Appraisal assesses perspective taking and ability to understand that social communicative contexts are dynamic, as well as ability to perceive and adequately process interactive effects of various contextual variables:

a. Communicative Partners: relates to understanding personal intent as well as the ability to infer what others are thinking or the intent of others. This also includes interpreting components of language that are not taken for face value that those with ASD struggle with: irony, sarcasm, idioms, and at times humor. Understanding the intent of others or the receptive aspect of social context will in turn result in the appropriate behavior or expressive response.

b. Physical Context Variables: involves interpreting social situations, settings, changes in settings, disruptions of routines, and flexibility in disruption of

routines. The ability to correctly assess social situations, similar to communicative partners, will again aid in the appropriate behavior given the circumstance.

Paralinguistic Decoding

Paralinguistic Decoding is a form of non-instrumental communication which measures the subject's ability to read micro-expressions and nonverbal language. Nonverbal communication can be just as meaningful as spoken words. It can suggest what a person is feeling and thinking without the use of words. Often, it can also reveal how a person truly feels although their verbal communication may be contradictory. An appropriate understanding of nonverbal language is critical in understanding another person, and in turn, it leads to an appropriate verbal response.

Previous research has shown that individuals with ASD show impairment in pragmatic language that requires attention to social cues such as facial expressions in a social context. Colich, Wang, Rudie, Hernandez, Bookheimer, and Dapretto (2012) found that ASD individuals struggled to use facial cues when inferring the intent of others [49]. Philofsky, Fidler, and Hepburn (2007) noted that a failure to understand gestures and body language can result in use of uninhibited, socially inappropriate comments, an overuse of stereotyped utterances and tangential language, and increased use of made up words [50].

Pragmatic Performance

Instrumental Performance

Instrumental Performance assesses the ability to adequately and appropriately use introductions, farewells, politeness, make requests, respond to gratitude, request help, answer phone calls, request information (e.g., directions), ask for permission, etc. Instrumental performance is defined in the same manner as instrumental performance appraisal; however instead of understanding, it assesses one's ability to adequately and appropriately express or use verbal means-end processes. Means-end or essential communication skills are necessary as they are the building blocks to more complex language processes such as taking turns in conversation, expressing appropriate emotion, and more generally speaking, social communication. Luczynski and Hanley (2013) conducted a study in which preschool students were taught to request teacher attention, teacher assistance, and preferred materials [51]. These strategies were delivered through teacher instruction, modeling, role play, and differential reinforcement. The taught strategies produced effective results; students were able to improve their pragmatic language skills as well as maintain and continue to apply them in the classroom. In addition, these skills aided in the prevention of problematic behavior. In a previous study which had similar aims to the present study, Luczynski and Hanley (2013) used role playing and modeling as opposed to pictures to achieve their desired use of communication and ultimately behavior [51].

Affective Expression

Affective Expression is a non-instrumental form of communication which examines the ability to appropriate express polite refusal, regret, support peers, give compliments, use humor, express empathy, gratitude, and encouragement. This requires higher level thinking because its purpose is not designed to fulfill basic needs. Children who more often make reference to emotional states do so because they possess a deeper understanding of mind and emotion. This skill crucially affects the flow of conversation, the ability to understand others point of view, and is essential in relationship building. Individuals with autism not only struggle with the understanding emotional cues, but also with affective expression. Studies have found that children with autism are less likely to show positive emotion and more likely to demonstrate a flat affect [52].

Affective expression also encompasses or can mutually affect conversational techniques such as topic selection, maintenance, introduction, transition, and closure. Generally, a speaker is responsive to their conversational partner. This can be expressed through verbal feedback or affective expression. Selection of either or both of these expressions is often changed or determined pending on what the conversational partner may say. The use of affective expression or nonverbal language is a significant factor that may impact a speaker's use of language. These expressions are often noted in facial expressions, body posture, tone of voice, and eye contact.

These expressions, in turn, portray positive and negative reactions that may result in change of topic, conversation contingency and repair. Buekeboom (2009) studied the effects of a conversational partner's affective expression on a speaker's language use [53]. They reported that listeners' affective expressions change a given speaker's

language use. Void of language, affective expression can impact the flow of a conversation because it is can be viewed as a sign of understanding, or on the contrary, disapproval. Affective expression can be attributed to conversational adaptations because it requires the speaker to be flexible and responsive to the flow of the conversation.

Paralinguistic Signals

Paralinguistic Signals is also a non-instrumental form of communication which assesses one's ability to appropriately use micro-expressions, gestures, and prosody. As opposed to paralinguistic decoding, paralinguistic signals are the acting out of the micro-expressions and gestures. Similar to affective expression, paralinguistic signals impact the speaker's choice of language and consequently the flow of the conversation. Assessing for such a construct is critical as it helps target specific pragmatic deficits in an individual who we may already know has general difficulty in pragmatic language.

Multiple studies have examined the topic of prosody [54, 55, 56]. Prosody is defined as the rhythm, stress or intonation of speech [54]. In regards to pragmatics, a speaker's tone can reveal information regarding a speaker's intent. However, studies have revealed that individuals with ASD have deficits in speech prosody, prosodic comprehension, and therefore the ability to draw inferences from a speaker's rate or tone of voice [57, 58]. This makes the understanding of idioms, metaphors, and irony, and sarcasm even more difficult to understand, as the inferred meaning differs from its literal meaning [49].

For the purposes of this study, pragmatic language consists of two broad constructs: pragmatic judgment and pragmatic performance. Under each of these

constructs are sub-constructs that consists of specific components, both receptive and expressive, that define pragmatic language.

Previous studies have been instrumental in the development of a novel tool, the *Clinical Assessment of Pragmatics*. This is a comprehensive pragmatic language assessment which defines specific strengths and weaknesses in students who present with HFA and SLI. Quantitative data derived from this assessment may be effective in developing more appropriate student interventions. The goal of this study is to examine the validity and reliability of this instrument based on the test administration and results on adolescent subjects who have been diagnosed with HFA, SLI, and a neuro-typical control group.

Methodology

Participants

Participants were 10 non-disabled students, 10 students with high functioning autism, and 10 students with Language Impairment (LI), ages 14 to 16 years old. Non-disabled students included in the study met the following criteria: 1) exhibited hearing sensitivity within normal limits; 2) presented with age-appropriate speech and language skills; 3) successfully completed each school year with no academic failures; and 4) attended public school and placed in general education classrooms. Inclusion criteria for the high functioning autism group was: 1) having a current diagnosis within the high functioning autism spectrum or Asperger's Syndrome (based on medical records and special education eligibility criteria); and 2) currently attending a local public school, and enrolled in the general education classroom for at least 4 hours per day. Exclusion criteria

included comorbid conditions as defined by a DSM- V diagnosis of mental health problems such as clinical disorders, personality disorders and general medical conditions. Finally, the inclusion criteria for the LI group were: 1) having a current diagnosis of Expressive Language delay and Pragmatic Language Impairment (scoring below the 7th percentile on two standardized expressive language tests) or having a current diagnosis of Global Language delay (scoring below the 7th percentile on two standardized receptive and expressive language tests) and having a diagnosis of Pragmatic Language Impairment based on the California Department of Education eligibility code; 2) currently attending a local public school, and 3) being enrolled in the general education classroom. Students from the LI group were excluded from the study if the following were identified: 1) intellectual disability, learning disability, emotional disturbance; 2) comorbid conditions where the student has a DSM- IV diagnosis of mental health problems including clinical disorders, personality disorders and general medical conditions. Additionally, all participants were expected to reside in the Inland Empire region of Southern California. Students were recruited through a licensed speech language pathology nonpublic agency, namely Hill Rehabilitation Services, LLC.

Instrumentation

The Clinical Assessment of Pragmatics (CAPs) test measures both pragmatic judgment and pragmatic performance has a total of six subtests. Each subtest is a collection of 10 video-based role-playing scenarios which presents a target social situation which reflects the pragmatic domains 'pragmatic judgment' and 'pragmatic performance', for a total of 60 short videos. These videos were livestreamed and

presented to participants on personal computers. A description of each subtest is

presented in Figure 1.

PRAGMATIC JUDGEMENT
ability to perceive what correct and incorrect responses in various social contexts are

PRAGMATIC PERFORMANCE
ability to provide appropriate responses in a given social situationt correct and incorrect responses in various social contexts are

SUBTEST 1 – Instrumental Performance Appraisal

a form of basic instrumental comprehension process that includes the ability to judge appropriateness of introductions, farewells, politeness, making requests, responding to gratitude, requesting help, answering phone calls, requesting information (e.g., directions), asking for permission, etc. given a specific scenario.

SUBTEST 4 – Instrumental Performance

a form of basic instrumental oral expression process that includes the ability to adequately and appropriately express or use verbal means-end processes such as verbal use of introductions , farewells, politeness, making requests, responding to gratitude, requesting help, answering phone calls, requesting information (e.g., directions), asking for permission, etc

SUBTEST 2 – Social Context Appraisal

a form of non-instrumental comprehension process that includes perspective taking and ability to understand that social communicative contexts are dynamic, as well as ability to perceive and adequately process interactive effects of various contextual variables

SUBTEST 5 – Affective Expression

a form of non-instrumental pragmatic expression process that includes the ability to appropriately express polite refusal, regret, support peers, give compliments, use humor, express empathy, gratitude, and encouragement.

SUBTEST 3 – Paralinguistic Decoding

a form of non-instrumental comprehension process which measures the subject's ability to read micro-expressions and nonverbal language

SUBTEST 6 – Paralinguistic Signals

a non-instrumental form of pragmatic expression which assesses one's ability to appropriately use micro-expressions, gestures, and prosody

Figure 1. Description of the Clinical Assessment of Pragmatics Subtests

All participants received the Clinical Assessment of Pragmatics (CAPs). Individual administration took approximately 45 to 55 minutes. California licensed speech language pathologists (with training in the present protocol) administered this test to participants in quiet rooms in their homes free from distractions.

Before test administration, each participant received two practice videos. The practice videos familiarized the participant with the test requirements and sought to ensure that each participant had a firm understanding of tasks involved. Individual participant testing followed a standardized administration format. This format involved a visual-auditory presentation of each of the video role-plays, at a normal conversational rate of speech using normal patterns of intonation. In addition, the content of the videos contained age-appropriate vocabulary.

Prior to watching individual video role-plays, the participants were given the following instructions for the different pragmatic domains:

Pragmatic Judgment Subtests

The participants were required to watch individual video role-plays and respond in the following manner: "We're going to look at some short videos of social situations. You'll have to listen carefully because you can only see them once. After watching the video, you will be asked if anything went wrong in the video."

Pragmatic Performance Subtests

The participants were required to watch individual video role-plays and respond

in the following manner: "We're going to look at some short videos of social situations. You'll have to listen carefully because you can only see them once. After watching the video, you will be asked what you would do in this situation."

Following, the participants were required to answer one of the following questions: "Did anything go wrong in this situation?" or "What would you say or do in this situation?"

Interrater Reliability

Interrater reliability measures the extent to which consistency is demonstrated between different raters with regard to their scoring of participants on the same instrument [59]. For the inter- rater reliability study, data was examined by two California-licensed speech language pathologists (the first author who has ten years of experience and the second rater without experience scoring the CAPs test) who independently evaluated 15 test administrations that were selected in a random manner. The second rater had one training session during which the item-by-item scoring rules and the procedures of the study were presented before being asked to score the same verbatim responses of the 15 randomly selected participants.

Test-Retest Reliability

This is a factor determined by the variation between scores or different evaluative measurements of the same subject taking the same test during a given period of time. If the test is a strong instrument, this variation would be expected to be low [59]. The Clinical Assessment of Pragmatics was administered to randomly selected participants

during two periods. The interval between the two periods ranged from 16 to 20 days. To reduce recall bias, the examiner did not inform the participants at the time of the first administration that they would be tested again. All retesting was done by the same examiner who administrated the test the first time.

Validity

The validity of a test determines how well the test measures what it purports to measure. Validity can take various forms, both theoretical and empirical. This can often compare the instrument with other measures or criteria which are known to be valid [60].

For the content validity of the test, expert opinion was solicited. Seventeen speech language pathologists were contacted, all of whom were licensed in the state of California and held the Clinical Certificate of Competence from the Clinical Assessment of Pragmatics and had at least 3 years of experience working with children with Autism and Pragmatic Language Impairment reviewed the test. Each of these experts was presented with a comprehensive overview of each of the 6 subtest descriptions, as well as rules for standardized administration and scoring. They all watched 2 videos of a full length administration process of all 6 subtests. Following this briefing, they were asked 5 questions on how each of the subtests (total of 30 questions) related to the content of the test and whether they believed the test to be an adequate measure of pragmatic language skills. For instance, their opinion was solicited regarding whether the questions and student responses properly evaluated their ability to understand and use social language appropriately.

Criterion Validity

     In assessing criterion validity, a correlation analysis was not possible for all CAPs subtests when compared to the current body of pragmatic language tests. This was not viable because three of the CAPs six subtests, specifically, the Affective Expression, Paralinguistic Decoding, and Paralinguistic Signals, are unique in their content and design. (Figure 2) These subtests cannot be compared to the existing body of pragmatic language tests because of their unique focus. For the concurrent validity of the remaining CAPs tests, we were able to correlate three of our subtests (Figure 2).

Instrumental Performance Appraisal	Social Context Appraisal	Paralinguistic Decoding	Instrumental Performance	Affective Expression	Paralinguistic Codes
• CASL • TOPL	• Social Language Development Test - adolescent edition	• none	• CASL • TOPL	• none	• none
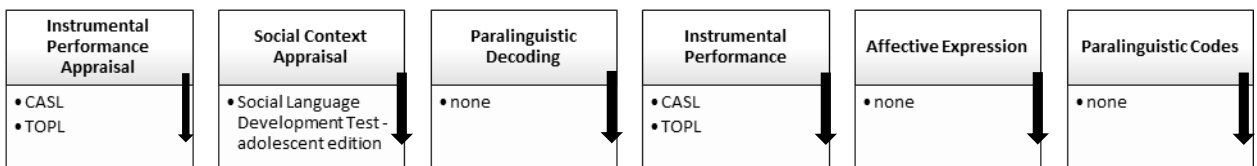
Figure 2. The Clinical Assessment of Pragmatics (CAPs) Subtests

     To examine criterion validity, correlations of the Instrumental Performance Appraisal and Instrumental Performance subsets with two other measures of pragmatic language tests, i.e., CASL and TOLD, were conducted. The *CASL* is an individually-administered oral language assessment for students with ages 3 to 21 years which. The test measures lexical, semantic, syntactic, and pragmatic language categories. The Pragmatic Judgment subtest of CASL measures pragmatic competence and use of rules of social language. The Instrumental Performance Appraisal and Instrumental Performance subtests of the CAPs and the Pragmatic Judgement subtest of the CASL were

administered to all 30 participants in counterbalanced order. Time between test administrations ranged from the same day to 5 days.

The *TOPL* is an evaluation of contextual social communication which is based on the determination of students' ability to choose appropriate content as well as make requests and express themselves with language. The Instrumental Performance Appraisal and Instrumental Performance subtests of the CAPs and the TOPL were administered to all 30 participants in a counterbalanced order. Time between test administrations ranged from the same day to 5 days.

The Social Context Appraisal subtest of the CAPS was compared to the Social Development Test – adolescent edition. *The Social Language Development Test* (for adolescents) is a standardized examination of different language skills which has a strong focus on social interpretation and the ability of the adolescent subject to interact with their peers using skills such as idioms and sarcasm. The Social Context Appraisal and the Social Development Test were administered to all 30 participants in a counterbalanced order. Time between test administrations ranged from the same day to 5 days.

Data Analysis

Data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 23.0. The general characteristics of the participants were summarized using frequencies and relative frequencies (%). The normality of the quantitative variables was examined using Kolmogorov-Smirnov and Shapiro-Wilk tests. For test retest reliability and inter rater reliability, intraclass correlation coefficients (ICCs) and corresponding 95% confidence intervals (CIs) were calculated. ICCs that were less than 0.40 were

considered poor, 0.4-0.7 considered moderate, 0.7 to 0.9 considered substantial, while

ICCs above 0.9 were regarded as being excellent. The concurrent validity was assessed

using Pearson's correlation among CAPS, CASL, TOPL and the Social Language

Development tests. Correlation coefficients of ≥0.7 are recommended for same-construct

instruments while moderate correlations of ≥ 0.4 to ≤0.70 are acceptable. The level of

significance was set at p≤0.05.

Results

Thirty participants enrolled in the study. The characteristics of the participants by

group is displayed in Table 2. Sixty percent of the participants in the control and the high

functioning autism groups were males. The majority of the participants in each group

were white. Languages spoken at home included English, Spanish, Cantonese, Tagalog,

and Russian. The language mainly spoken at home was English (50-60%).

Table 2: Characteristics of Participants by Group (N=30)

	Control (n=10)		SLI (n=10)		Autism(n=10)	
	Frequency	%	Frequency	%	Frequency	%
Gender						
Male	6	60	7	70	6	60
Female	4	40	3	30	4	40
Ethnicity						
White	4	40	5	50	4	40
African American	3	30	1	10	2	20
Hispanic	1	10	4	40	3	30
Asian	2	20	-	-	1	10
Languages at home						
Spanish	1	10	4	40	3	30
Cantonese	1	10	-	-	1	10
Russian	1	10	-	-	1	10
Tagalog	1	10	-	-	-	-

Abbreviations: SLI, specific language impairment

The test retest reliability of the various subtests was excellent. The individual ICC values for the various subtests ranged between 0.91 and 0.98. (See Table 3).

Table 3: Test-Retest Reliability of the CAPs Subtests (n=30)

	ICC	Lower 95% CI	Upper 95% CI
IPA	0.97	0.92	0.99
SCA	0.95	0.91	0.97
PD	0.91	0.82	0.94
IP	0.98	0.96	0.99
AE	0.93	0.87	0.96
PC	0.92	0.90	0.94

Abbreviations: IPA, Instrumental Performance Appraisal; SCA, Social Context Appraisal; PD, Paralinguistic Decoding; IP, Instrumental Performance; AE, Affective Expression; PC, Paralinguistic Codes.

Similarly, the inter rater reliability of the various subtests was excellent. The individual ICC values for the various subtests ranged between 0.82 and 0.94. (See Table 4).

Table 4: Inter- Rater Reliability of the CAPs Subtests (n=30)

	ICC	Lower 95% CI	Upper 95% CI
IPA	0.90	0.74	0.96
SCA	0.95	0.91	0.97
PD	0.92	0.85	0.97
IP	0.95	0.92	0.98
AE	0.84	0.71	0.93
PC	0.82	0.75	0.91

Abbreviations: IPA, Instrumental Performance Appraisal; SCA, Social Context Appraisal; PD, Paralinguistic Decoding; IP, Instrumental Performance; AE, Affective Expression; PC, Paralinguistic Codes.

When assessing validity, the CAPS was significantly correlated with the CASL Pragmatic Judgement subtest, the TOPL and the Social Language Development test. The correlation between the Instrumental Performance Appraisal subtest of the CAPs and the CASL, the TOPL and the Social Language Development test were 0.96, 0.95 and 0.81 respectively, p<0.001). Similarly, the correlation between the Instrumental Performance subtest of the CAPs and the CASL, the TOPL and the Social Language Development were 0.87, 0.88 and 0.84 respectively, p<0.001). (Table 5)

Table 5: Pearson's Correlations between CAPs Subtests (n=30)

	CASL **(PJ)**	TOPL	**SLDT**
IPA†	0.96	0.95	0.81
IP†	0.87	0.88	0.84

Abbreviations: IPA, Instrumental Performance Appraisal; IP, Instrumental Performance; CASL (PJ), the Clinical Assessment of Spoken Language (Pragmatic Judgement); TOPL, the Test of Pragmatic Language; SLDT, the Social Language Development Test.
† significant at an alpha of 0.001 level of significance.

For the content validity, the 17 reviewers rated each CAPs subtest on a decimal scale, having to rate 5 questions per subtest with a total possible score of 50. All reviewers agreed that CAPs is a valid measure for assessing pragmatics in students who are ages 14 to 16 years. The mean rating for the Instrumental Performance Appraisal, Social Context Appraisal, Paralinguistic Decoding, Instrumental Performance, Affective Expression and Paralinguistic Codes subtests were 47.7±0.9, 47.1±0.8, 47.0±1.0, 48.4±0.7, 47.2±0.6, 47.9±1.3 respectively. The following were some of the comments provided by the reviewers: "This is quite an innovative way of testing pragmatic language"," It appears to be an accurate measure of students' pragmatic skills and I am glad to see a separate focus on comprehension versus performance", "The new terminology that you're attempting to introduce is excellent, however the subtest names might be difficult to remember", "Although the presentation of the videos was clear and age-appropriate, I am concerned that the number of the videos in the test might cause fatigue and affect student scores", "I appreciate the ethnic diversity of student actors. Also, the idea of using videos of everyday social situations should definitely become a new standard in testing pragmatics".

Discussion

The basis for developing this test, and the impetus for its use in practice, lies in the frustrations expressed by speech language pathologists with regard to the scarce availability of comprehensive standardized measures of social-pragmatic communication deficits. Some practitioners have gone on record as saying that an effective, standardized instrument may never be developed [30]. Researchers and practitioners have long argued of the need to develop pragmatic language assessments that target the unique social language characteristics of students with high functioning autism and pragmatic language impairment such as higher level language comprehension, inferential thinking and understanding the mind of others [34]. Current means of assessing students who fall into this complex 'gray area' of higher level pragmatic language ability have long relied on careful dynamic and informal observations and documentation. This comes at a major cost of time and labor to identify evidence to indicate that these students qualify for special services through the public schools or specifically, communication intervention. However, even with careful dynamic observations and assessment, it is difficult to determine that these students have the deficits with which their caregivers and educators may suspect they present. Routine observations without a close understanding of the criteria which determines these students' larger deficits in social interaction and socialization may not be insufficient. The present presents a viable testing method: a comprehensive test of pragmatic language ability, one which is not only able to evaluate students' instrumental and "surface" conversational skills, but can be sensitive to the higher level pragmatic skills such as understanding and expression of body language,

facial micro-expressions or ability to appropriately express consolation, affection or humor.

In this study, we found that the test-retest reliability for all six subtests was excellent (ICC > 0.90), and the interrater reliability was high (ICC > 0.80). This is indicative of strong test reliability.

A correlation analysis was not run on all subtests of this test (as compared to the current body of pragmatic language tests), because three of the CAPs six subtests, namely the Affective Expression, Paralinguistic Decoding, and Paralinguistic Signals, are unique. These subtests cannot be compared to the current body of pragmatic language tests because of their unique design and focus. In addressing the concurrent validity of the remaining CAPs tests, we were able to correlate three of our subtests. These subtests were correlated to the existing measures (the CASL, TOPL and the Social Development Test) and found to be comparable. Significant correlations were found between two CAPs subtests, i.e., Instrumental Performance Appraisal and Instrumental Performance subtests, and the CASL Pragmatic Judgement subtest and the TOPL. In addition, we correlated the Affective Expression subtest to the adolescent edition of the Social Development Test, because both of these tests assess higher-level abilities in pragmatic language, and are not limited to basic instrumental performance and skills in social situations. Both of these tests examined subjects' abilities in complicated social situations, such as skills in inferencing or in expression of support. We found significant correlations which showed that the Affective Expression subtest is clinically-comparable to existing tools which test for pragmatic language skills.

We asked a body of experts to help in assessing the content validity of CAPs subtests, particularly the ones which are of unique design. They agreed that these subtests are unique, effective and appropriate way to assess the more sophisticated pragmatic skills. In particular, these subtests were judged to be effective in detecting deficiencies in subjects' decoding of facial micro-expressions or other expressions which were based on intonation or inflection. These experts agreed that these tests were effective means of obtaining an accurate sense of comprehensive pragmatic language profiles not just limited to expression of basic social skills within instrumental social situations. In addition, these subtests were judged to be of strong ability to evaluate for students' capacity for understanding complicated social situations when presented with video based real-life social situations and by judging of students' actual facial expressions and affective language. In addition, by evaluating students' ability to *respond* with their own facial expressions (as well as their reactions, verbal and not), students' pragmatic language performance was judged to be a more dynamic means of evaluating affective abilities as compared to tests with static pictorial stimuli.

Strengths

Strengths of this study include the ethnic diversity and cultural background of the study participants. However, the most notable benefit of the study was the unique test design consisting of videos which were true to life interactions. The videos were presented in a relevant, life-like content, and the actors in the videos came from a wide variety of ethnic and cultural backgrounds. Verbal dialogue in the videos easy to listen to and understand and was presented at a rate that was controlled for speed without being

unnaturally slow. Vocabulary used in the videos was appropriate to the ages of the study participants, and the real-life situations were those which might be expected to occur in environments with which the participants could be expected to be familiar.

The CAPs test can be administered with relative ease, and evaluates both participants' relative level of pragmatic judgment (meaning their ability to comprehend social situations), and their ability to *express* themselves in an appropriate manner within various social situations. The pragmatic performance aspect of this test identifies the crucial differences which is a unique feature of our test, because it affords the examiner an opportunity to consider the participants' responses (verbal, as well as micro-expressively and with body language). This test is notably strong for its test-retest and interrater reliability, and for both face and content validity.

Limitations

Notable limitations are demographic in nature: more male students participated in the autism group study, due to an inability to secure a strong number of female participants. However, this can be considered reflective of the increased likelihood of male students to present with autism based on current incidence rates. We were unable to secure a large number of Asian students for either the language impairment or autism groups.

Clinical Implications

There is a major need for a comprehensive standardized measure of pragmatic language skills. This is an area well-known as difficult to test because it consists of a

gamut of high level intangible and intricate language skills that are challenging to elicit and objectively measure. For this reason, there is a major need for evidence-based tools which can provide accuracy in the diagnosis of students who present with pragmatic language impairment.

This study allowed for validation to be observed in the use of the CAPs. This is a tool which is both valid and reliable and can be used as a means of determining whether school-aged students present with deficits in pragmatic language skills functionally indicative of high-functioning autism or specific language impairment. In addition, this battery of subtests provides significant insight into other characteristics presented by these students, and indicates directions in which future therapies might focus.

Summary

Beginning with 'superficial' layers of instrumental social situations, this test delves into every level of pragmatics, and assesses 'intricate' high-level skills such as students' ability to express sadness, affection, displeasure, support, and surprise in an appropriate manner. A key area which may have been overlooked by traditional testing is higher level pragmatic language comprehension and performance. Even students for whom the traditional testing (which for example evaluate instrumental socialization such as answering the phone) find no deficiency, an intangible disability often remains noticeable to parents or teachers. Such areas often do not include an inability to initiate or maintain conversational speech, or to maintain eye contact, or other such obvious areas of deficiency more easily tested by conventional manners of assessment. However, something is lacking in these students' abilities which must be determined if these

students are to be served by educators and hope to gain confident roles in society in the future. These children often have difficulties in inferential thinking, such as that which is determined by facial expressions but also by the body language and more subtle implications presented by others in the course of conversation. In addition, while these students, many of whom have Asperger's Syndrome, have difficulties in responding to or processing micro-expressions, they also have difficulty in expressing common emotions: these students often cannot properly express consolation, affection, or sarcasm or other forms of complicated humor. As a result, these subjects who might score high on common measures of *linguistic* aptitude may present with difficulty in social interaction, and tend to have low rates of social and academic success.

The CAPs is an effective means by which speech language pathologists, as well as other related practitioners, can obtain greater understanding of their students' needs, as well as areas of strength and weakness. We recommend conducting future studies on younger children (ages 7 to 12) or older (ages 17 to 21). Further studies on student performance and the effect of poor linguistic comprehension on pragmatic ability could be significantly beneficial in better understanding pragmatic language deficits. Finally, understanding differences along cultural lines may help in understanding whether there are differences among students who do not speak English as compared to their English-speaking counterparts.

CHAPTER THREE

AN ANALYSIS OF PRAGMATIC LANGUAGE PROFILES IN STUDENTS WITH HIGH FUNCTIONING AUTISM AND SPECIFIC LANGUAGE DELAY BASED ON THE VIDEO-BASED CLINICAL ASSESSMENT OF PRAGMATICS (CAPS)

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Abstract

The purpose of this study was to comparatively examine and analyze pragmatic language profiles of three groups of adolescents. Pragmatic language abilities were elicited through a novel video-based approach; the Clinical Assessment of Pragmatics (CAPs). Participants were students with specific language impairment (SLI), high functioning autism (HFA) and typically developing students. One hundred and twenty participants, ages 14 to 16 years old, were administered 3 pragmatic judgment and 3 pragmatic performance subtests comprised of 10 items each for a total of 60 test items. Results revealed significant differences among all groups of students on expressive and receptive pragmatic language tasks. Students with HFA and SLI demonstrated adequate performance on instrumental pragmatic language tasks, however, they had significant difficulties on higher order pragmatics such as perceiving irony, sarcasm, and expressing sorrow or support. Furthermore, the HFA group was distinguished by profound deficits in students' ability to recognize and appropriately use facial expressions.

Key Words: pragmatic language, assessment, high functioning autism, specific language delay

Introduction

This study addressed the importance of pragmatic language, social language skills used in daily interaction, and how these skills influence children's interactions with others. Additionally, these skills were examined to determine how they influence students' performances throughout the course of their intermediate education. Pragmatic language was also considered as it is reflected in autism spectrum disorders (ASD), particularly among students presenting with high functioning autism (HFA). Finally, pragmatic language as reflected in students with moderate to significant language impairments (SLI) was explored with focus on their ability to process language and the spoken word in the classroom setting.

This research was influenced by linguistic study, specifically how individuals extract meaning from what they hear and read, as well as the means by which they produce and convey meaning in speech and writing. As described by Peccei (2002), such a linguistic consideration is informed by the distinction between semantics and pragmatics. Purely linguistic in nature, semantics reflects and involves the consideration of meaning which is produced by language (Peccei, 2002; Steinberg & Jakovits, 1971; Wierzbicka, 1996). In contrast, pragmatics concentrates on aspects of meaning which are not predicated by linguistic information alone (that is, on words), and instead involves knowledge and application of cues and information derived from physical environment and socialization (Kasher, 1998; Levinson, 1983).

Pragmatics' definition is reinforced in the work of Andersen (2001), who argues that variation in speech and use of language is social in nature when considered from a semantic perspective, but there is also strong basis for culture, age, and gender-specific

variations. Linguistic features of spoken interaction are "largely context-dependent," and manifest as the product of "inferential processes in utterance interpretation" (Andersen, 2001, p. 5). This is a process far more subtle and complex than the rote process of "linguistic encoding" upon which the vast majority of language and communication appears to be based (Andersen, p. 5). While Andersen considers the variation in pragmatic methods of decoding speech in the context of cross-generational communication (particularly between adolescents and adults), a similar variation in encoding and decoding mechanisms, is also seen among students with different learning abilities. Encoding and decoding mechanisms are also considered by Li (2015), who argues that as much as these concepts are based in speech, they are also expressed by "gestures of hand and head movements", as well as "prosodic structure" and the frequency and prominence of given utterances (Li, 2015 p. 195).

.   Examples of pragmatic difficulties in communication are described by Bishop (1997) as problems in communication that reflect an inappropriate use of language which are not necessarily incorrect. For instance, in students who present with pragmatic language difficulties, they may use "utterances that are syntactically well-formed and complex," but which are inappropriate in the context in which they are taking place (Bishop, 1997). Some difficulties in diagnosing this disorder may result from this distinction (Anderson, 2013, Mash & Wolfe, 2015).

It is for this reason that the importance of pragmatic language in the context of learning disorders and childhood development is crucial. SLI manifests in childhood under normal development as a selective, and often overlooked or misinterpreted difficulty in mastering the nuanced particulars of language. Bishop and Leonard (2014)

describe cases of SLI as reflecting a difficulty on the part of the child with respect to the structure of language. This difficulty, which is also explored by Leonard (2014) indicates that some structural damage or developmental problem is at fault. However, these problems are often more difficult to diagnose and treat than they seem at first. Rather than a structural understanding of language being at fault for students' communication impairment, they may instead present with "pragmatic difficulties," or problems in appropriate language use in a specific context (Bishop & Leonard, 2014, p. 99). A major difficulty with undiagnosed pragmatic communication disorders is that because of communication difficulties, students may be reluctant to communicate at all. This leads to a "negative spiral", as such reluctance halts further attempts at communication with the context-impaired student. This occurs because these students find a lack of positive feedback in any communication, meaning that this problem is likely to continue (Bishop & Leonard, p. 99).

Pragmatic language difficulties are problematic in the context of education, and pose a strong barrier to effective learning. The current literature reports that students diagnosed with SLI tend to also have pragmatic language disorders (Green et al., 2014). Also, there is research to support that pragmatic communication difficulties are consistently present in students with autism spectrum disorders (Bishop & Leonard, 2014; Kot & Law, 1995).

As described by Bartak et al. (1975), there are many similarities between those with SLI and those with HFA, but there are also several marked differences. First, none of the participants from which these researchers collected information used gestures in communication and, half of the language-impaired subjects failed to perform this

common communication activity. Secondly, among participants presenting with language difficulties, such difficulties could be explained in terms of lack of communication skills, whereas participants with autism showed "qualitative oddities" in their use of language which could not be contextualized as a deficiency in necessary skills (Bartak et al., 1975, p. 127). For instance, language-impaired children with autism were observed as using indecipherable words and phrases which held private meaning. Not only were the children with HFA deficient in effective communication skills, they also lacked the contextual and pragmatic understanding of when to use the ineffective, and personalized skills that they had acquired over their lives (Murdoch, 2013; Cummings, 2014; Norbury et al., 2008).

Children with language impairments have significant difficulty in mastering syntax and overall semantic language use. They also exhibit limitations in their capacity for vocabulary and the use and decoding of complex sentence structure. Those with high functioning autism show greater difficulty in context-specific and pragmatic language use. Yet, despite the findings of Bartak et al. (1975), Bishop and Leonard (2014) caution against labeling all children who present with "autistic-like pragmatic difficulties" as 'children with autism', because many of the Bartak cases were difficult to concretely categorize, and "only a small subset" of identified cases with pragmatic difficulties showed "significant autistic features" in domains beyond linguistics, semantics, and wider communication (Bishop & Leonard, p. 106). Pragmatic disorders are recommended to be clearly delineated from autism by other authors who caution against misdiagnosis (Bishop, 1989; Volkmar, 1998; Volkmar et al. 2014).

Despite the apparent distinction between language impairment and autism with respect to contextual and pragmatic communication difficulties, there is a clear need to identify students unable to comprehend or practice proper communicative context and pragmatic language. This concept is highly relevant in an educational context. Pragmatic language deficiencies adversely affect the social and academic performance of school-aged children; especially those who present with HFA and SLI. The relevance of considering contextual and pragmatic language impairment, and the importance of identifying students who present with such impairments in order to provide them with the specialized education which they require, cannot be understated.

Pragmatic Language Assessment

At present it is highly difficult to assess students' skills with respect to pragmatic language ability, a problem which is owed to the dynamic and subjective nature of this skill-set. The following is a review of the current modes and methodologies used to assess students' capabilities with respect to pragmatic language abilities in the classroom.

Common areas of interest which any testing must address to determine a students' capacity for understanding context-driven pragmatic conversational elements are as follows: (1) *Acts of speech*, including various greetings, assertions, questions, requests, and the delivery of information; (2) *Social behavior*, including facial expressions, posture, the taking of turns, and the establishment and maintenance of eye contact; (3) *Conversational behavior*, including the initiation of exchanges of information, the continuance of a given topic, as well as 'repairing' breakdowns in communication, and (4) *Rules and conventions* of conversation, including being informative, efficient,

relevant, and clear (Brookshire & McNeil, 2014). Other researchers provided consistent understanding of these concepts (Lindsay et al., 2010; Eales, 1993).

While many of these context-sensitive pragmatic difficulties are reflective of an autism spectrum disorder, autism is not necessarily a direct indicator of the presence of difficulty in pragmatic speech and communication. The present research will consider means by which the presence of a pragmatic language and communication disorder are identified.

One standardized tool by which pragmatic language skills are assessed is the *Test of Pragmatic Language (TOPL)* (Phelps-Terasaki & Phelps-Gunn, 1992). This tool evaluates subjects' facility and capability in six areas of pragmatic understanding. These areas are comprised of the ability to understand different aspects of communication, including physical setting, audience, purpose or topic and, related abstraction in communication with visual-gestural cues (Phelps-Terasaki & Phelps-Gunn, 1992). According to Adams (2002), the *TOPL* fails to test for pragmatics *per se*, but is rather "more akin to a test of high-language competency". It also fails to test for the social and interactional aspects which are essential for making this determination (Adams, 2002, p. 973). The TOPL has been widely considered by other authors whose comprehensive studies attest to its usefulness in helping to understand communication disorders (Young et al., 2005; Volden et al., 2009; Kim and Kaiser, 2000).

Adams' (2002) critique of the TOPL reflects key difficulties in testing pragmatic and context-sensitive language ability. As pragmatic language disorders and deficiencies are social and interactional phenomena, they are observable only in the context of social interaction. These different elements are difficult to quantify, much less examine in a standardized manner because they are "fluid and spontaneous," as the behaviors of each

party (especially the testing subject) are "influenced by the behavior of the other participants" (Brookshire & McNeil, 2014, p. 131). While standardized measures of pragmatic language ability may reflect something of such nuances by their consideration of certain 'benchmark' communication abilities such as subjects' ability to appreciate "nonliteral meanings" or inferences or otherwise "resolving ambiguity" in conversation, these are ultimately ineffective measures (Brookshire & McNeil, p. 131). Uniform testing for difficulty in context-driven language ability are based on tested factors being secondary to the true social context under which an accurate determination can be made (Oller & Richards, 1973; Canale, 1980; McNamara & Roever, 2006).

Some testing methodologies attempt to correct for this disparity by moving past an individual testing methodology to use checklists of pragmatic behavior. As opposed to standardized and quantitative testing, which often assumes a connection between ability and disorder, checklists "permit users to describe, quantify, and categorize" when pragmatic behavior has taken place (Brookshire & McNeil, 2014, p. 131). Similar to a psychological inventory, these checklists provide both users and testers with a means by which various categories of behavior can be put into a larger context. For instance, the *Pragmatic Protocol* (Prutting & Kirchner, 1987) tests for incidents of specific inappropriate pragmatic behaviors over the course of 15 minutes of conversation between the subject and a familiar conversational partner. This testing method involves a third party who assesses various categories of inappropriate contextual and pragmatic behaviors, including topic maintenance and turn-taking, in order to make this assessment. *The Pragmatic Protocol* is often seen as superior to stricter testing regimens because

pragmatics itself is a broader concern than can be determined by proper language use (Prutting & Kirchner, 1987).

As described by Haynes et al. (2012), the deficiency inventory assessments are rarely conducive to widespread testing, and when they are used, they do not provide a clear picture of any subject in the context of their peers. Researchers advocate the use of standardized testing as a means by which such a comparison can be made. They also recommend that students be screened for such deficiencies in a more widespread manner than can be achieved through inventory screening. Once a given student is identified as being 'at risk' for presenting with a language or speech disorder, then researchers advocate use of informal testing, similar to Prutting and Kirchner's (1987) pragmatic protocol as a means of making a final and accurate determination.

One final means of testing for pragmatic communications difficulties involves informal assessment. Under such testing, at-risk students are assessed on their skills in "spontaneous conversation," by describing stories or other particular tasks (Haynes et al., 2012, p. 176). In the course of these conversations, students may be asked to recall a specific story with which they are familiar. In the course of telling this story, the assessor will monitor students' behavior for problems in to sequence, complexity, and their comfort with taking the listeners' perspective into account (Haynes & Pindzola, 2007).

Most current methodologies which assess students' difficulty in pragmatic conversation may miss the mark when it comes to identifying relevant pragmatic behaviors in non-typically developing juvenile subjects. While traditional testing is is useful in terms of scalability, efficiency and use of time, these examinations test for tangentially-related communication skills which may not reflect the presence or absence

of a pragmatic communications deficiency. The use of checklists and inventories may seem preferable, but this requires a focused mechanism for subject evaluation as to compared traditional testing. Inventories employ quantitative thresholds which are used to determine the presence or absence of a pragmatic communication problem. Checklists and inventories' fallibility was explored in great detail by a variety of researchers, particularly those who argue for the subjective strength lost due to inefficiency (Orlando & Payne, 1983; Wroe et al., 1998; Archer, 2000; Zenk et al., 2007). According to Haynes and Pindzola (2007), by far the best means by which a pragmatic language disorder can be tested is through the subject undergoing rigorous formal and informal analysis by a speech-language pathologist which involves dynamic and informal observations. Based on the aforementioned reports, there is a need for a novel tool that will better prepare educators for future classroom requirements. In this study, a novel video-based assessment was used as an instrument for determining the pragmatic language skills held by students with autism and SLI. The naturalistic experience offered by a video-based approach may effectively evaluate students' pragmatic language and interaction ability while offering an objective, inexpensive, and efficient assessment.

Video-based Skill Assessments

Skills assessed in video form typically fall under the same category as those assessed by psychological inventories. While this tool allows for assessment to be facilitated by speech-language pathologists, video-based interventions for assessment and determination of communication deficiencies exhibit the same drawbacks as checklists. There is a strict threshold where failure may mean an inaccurate diagnosis of autism or

another communication disorder, and there is no way to ensure that subjects' interaction

with a given series of video prompts is being assessed properly except through a dynamic

interaction with an experienced professional (Lieberman et al., 2003; Weekley & Jones,

1997; Chan & Schmitt, 1997).

Nevertheless, for children with autism, video-based tools have been shown to be

viable means of assessment, behavior modeling, and for effective behavioral change. As

described by Lindsay et al. (2013), video-based interventions provide an efficient means

by which imitation models are presented to children with ASD. Rayner et al. (2009)

advocate the use of video-based interventions as a means by which persons with

disabilities such as autism or context-specific communications disorders can be taught a

"range of socially significant behaviors" (p. 291). As they describe, the term 'video-based

intervention' is used to describe any procedure by which video footage is the

"independent variable for intervention", and can be used in autism interventions

including "video modeling, video prompting, video self-modeling," as well as

"computer-based video instruction" and video 'priming' (p. 291).

In spite of the potential of video interventions toward modeling effective and

normative behavior, there are some difficulties with regard to the effectiveness of this

approach (Lindsay, 2013; Rayner, 2009). Video and multimedia interventions seek to

instill proper social behaviors in children with autism, but researchers found that many

subjects failed to understand the purpose of the gestures, actions, and behaviors being

modeled. Such "chameleon" effects describe instances when the subject mimics the

gesture in question, as opposed to emulating gestural function in a manner which reflects

true understanding. These researchers report that the deficiency that some subjects with

autism present in understanding the meaning of the gestures and actions modeled in video-based educational interventions shows that there is an attentional deficiency common to persons with autism spectrum disorders (Lindsay, 2013; Rayner, 2009; Miranda et al., 1998; McCabe & Rollins, 1994; Bliss et al. 1998).

In addition to the difficulty in determining why a given gesture or action should be imitated, Ingersoll (2008) found that subjects tested for autism and other communication deficiencies through use of video-based approaches also had difficulty in determining when to 'answer' a given video prompt. While typical child subjects tended to reciprocate to prompts in a rapid and spontaneous manner, subjects presenting with autism or similar communication disorders did not (Ingersoll, 2008). This may indicate that there are serious issues with the ability of video-based interventions to properly reach subjects with autism spectrum disorders. However, Ingersoll found that with simple repetition and practice, subjects required limited prompting to respond to the video assessment properly. This indicates that video-based assessments may be employed as a mechanism by which socially accepted interaction is trained through sample practice test items.

Video-based autism assessment tools may be used in conjunction with other traditionally employed tools in the assessment of students with a deficiency in pragmatic communication skills. Both tools can be effective in assessing students with pragmatic disabilities and enhance their behavior through video-based skills and communications training.

The present study addressed the following questions:

1. What trends are observed in the pragmatic profile of students diagnosed with high functioning autism (HFA) as identified by the Clinical Assessment of Pragmatics?

2. What trends are observed in the pragmatic profile of students diagnosed with SLI as identified by the Clinical Assessment of Pragmatics?

3. What similarities and differences can be observed in the profiles of the HFA and SLI students as identified by the Clinical Assessment of Pragmatics?

Methodology

Participants

One hundred and twenty participants, ages 14 to 16 years old, were recruited for this study. Participants were comprised of 40 non-disabled students, 40 with high functioning autism (HFA), and 40 students with Specific Language Impairment (SLI). Non-disabled students were selected based on the following criteria: 1) exhibited hearing sensitivity within normal limits; 2) presented with age-appropriate speech and language skills; 3) successfully completed each school year with no academic failures; and 4) attended public school and placed in general education classrooms. Inclusion criteria for the high functioning autism group was: 1) having a current diagnosis within the high functioning autism spectrum or Asperger's Syndrome (based on medical records and special education eligibility criteria); and 2) currently attending a local public school, and enrolled in the general education classroom for at least 4 hours per day. Non- disabled students were excluded if they presented with comorbid conditions as defined by a DSM-V diagnosis of mental health problems such as clinical disorders, personality disorders and general medical conditions. Finally, the inclusion criteria for the SLI group were: 1)

having a current diagnosis of Expressive Language delay and Pragmatic Language

Impairment (scoring below the 7th percentile on two standardized expressive language

tests) or having a current diagnosis of Global Language delay (scoring below the 7th

percentile on two standardized receptive and expressive language tests) and having a

diagnosis of Pragmatic Language Impairment based on the California Department of

Education eligibility code; 2) currently attending a local public school, and 3) being

enrolled in the general education classroom. Students from the LI group were excluded

from the study if the following were identified: 1) intellectual disability, learning

disability, emotional disturbance; 2) comorbid conditions where the student has a DSM-

IV diagnosis of mental health problems including clinical disorders, personality disorders

and general medical conditions. Additionally, all participants were expected to reside in

the Inland Empire region of Southern California. Students were recruited through a

licensed speech language pathology nonpublic agency, namely Hill Rehabilitation

Services, LLC.

Instrumentation

The Clinical Assessment of Pragmatics (CAPs) test measures both pragmatic

judgment and pragmatic performance and has a total of six subtests. Each subtest is a

collection of 10 video-based role-playing scenarios which presents a target social

situation which reflects the pragmatic domains 'pragmatic judgment' and 'pragmatic

performance', for a total of 60 short videos. These videos were livestreamed and

presented to participants on personal computers. A description of each subtest is
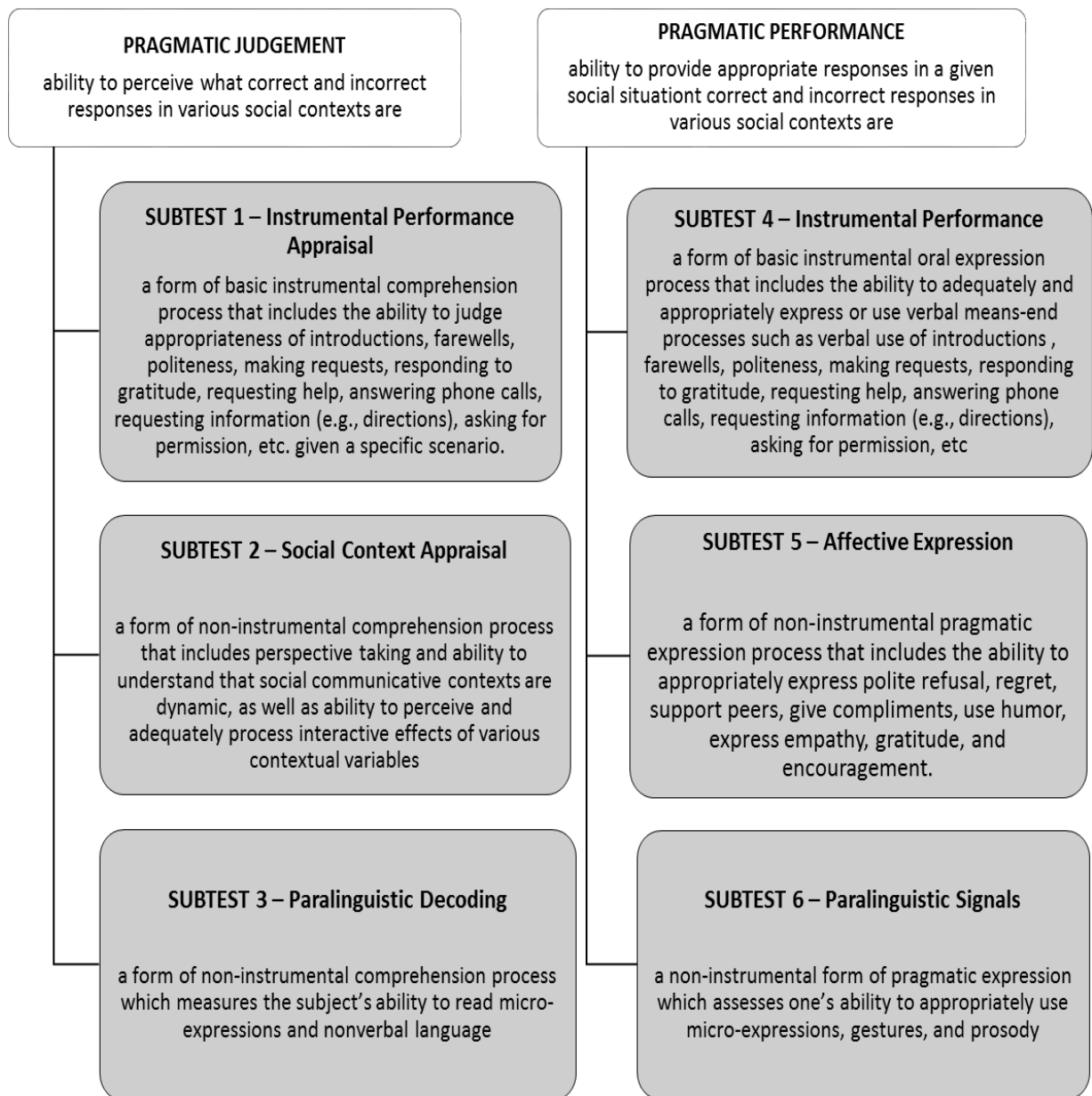
presented in Figure 1.

PRAGMATIC JUDGEMENT

ability to perceive what correct and incorrect responses in various social contexts are

PRAGMATIC PERFORMANCE

ability to provide appropriate responses in a given social situationt correct and incorrect responses in various social contexts are

SUBTEST 1 – Instrumental Performance Appraisal

a form of basic instrumental comprehension process that includes the ability to judge appropriateness of introductions, farewells, politeness, making requests, responding to gratitude, requesting help, answering phone calls, requesting information (e.g., directions), asking for permission, etc. given a specific scenario.

SUBTEST 4 – Instrumental Performance

a form of basic instrumental oral expression process that includes the ability to adequately and appropriately express or use verbal means-end processes such as verbal use of introductions , farewells, politeness, making requests, responding to gratitude, requesting help, answering phone calls, requesting information (e.g., directions), asking for permission, etc

SUBTEST 2 – Social Context Appraisal

a form of non-instrumental comprehension process that includes perspective taking and ability to understand that social communicative contexts are dynamic, as well as ability to perceive and adequately process interactive effects of various contextual variables

SUBTEST 5 – Affective Expression

a form of non-instrumental pragmatic expression process that includes the ability to appropriately express polite refusal, regret, support peers, give compliments, use humor, express empathy, gratitude, and encouragement.

SUBTEST 3 – Paralinguistic Decoding

a form of non-instrumental comprehension process which measures the subject's ability to read micro-expressions and nonverbal language

SUBTEST 6 – Paralinguistic Signals

a non-instrumental form of pragmatic expression which assesses one's ability to appropriately use micro-expressions, gestures, and prosody

Figure 1. Description of the Clinical Assessment of Pragmatics Subtests

Procedures

All participants received the Clinical Assessment of Pragmatics (CAPs).

Individual administration took approximately 45 to 55 minutes. California licensed

speech language pathologists (with training in the present protocol) administered this test to participants in quiet rooms in their homes free from distractions.

Before test administration, each participant received two practice videos. The practice videos familiarized the participant with the test requirements and sought to ensure that each participant had a firm understanding of tasks involved. Individual participant testing followed a standardized administration format. This format involved a visual-auditory presentation of each of the video role-plays, at a normal conversational rate of speech using normal patterns of intonation. In addition, the content of the videos contained age-appropriate vocabulary.

Prior to watching individual video role-plays, the participants were given the following instructions for the different pragmatic domains:

Pragmatic Judgment Subtests

The participants were required to watch individual video role-plays and respond in the following manner: "We're going to look at some short videos of social situations. You'll have to listen carefully because you can only see them once. After watching the video, you will be asked if anything went wrong in the video."

Pragmatic Performance Subtests

The participants were required to watch individual video role-plays and respond in the following manner: "We're going to look at some short videos of social situations. You'll have to listen carefully because you can only see them once. After watching the video, you will be asked what you would do in this situation."

Following, the participants were required to answer one of the following questions: "Did anything go wrong in this situation?" or "What would you say or do in this situation?"

Pilot Study

A pilot study including thirty participants, 10 non-disabled students, 10 students with HFA, and 10 students with SLI was initially conducted to examine the validity and reliability of the CAPs. Expert opinion was solicited for the purpose of obtaining content validity. Study results revealed that this instrument provides a valid and reliable comprehensive measure of pragmatic language skills. Both test-retest and interrater reliability were found to be strong. Experts rated the CAPs highly for both content and clarity. Concurrent validity was obtained on three of the CAPs subtests and was found to correlate to three existing pragmatic language instruments and measures (the Clinical Assessment of Spoken Language – Pragmatic Judgement subtest, the Test of Pragmatic Language and the Social Language Development Test, adolescent). CAPs was found to be a tool which is both valid and reliable and can be used as a means of determining whether school-aged students present with deficits in pragmatic language skills, specifically, high-functioning autism or specific language impairment (Lavi et al, in press).

Data Analysis

Data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 23.0. The general characteristics of the participants were summarized using frequencies and relative frequencies (%). The normality of the quantitative variables was

examined using Kolmogorov-Smirnov and Shapiro-Wilk tests. The distribution of the scores by study group was explored using Box and Whisker plots. The mean for the outcome variables (Instrumental Performance Appraisal, Social Context Appraisal, Paralinguistic Decoding, Instrumental Performance, Affective Expression, Paralinguistic Codes subtests) were compared among the three study groups using Kruskal Wallis analysis of variance (ANOVA). Further comparisons in mean scores between the groups were examined using Mann- Whitney U test. The level of significance was set at p≤0.05.

Results

One hundred and twenty participants enrolled in this study. The characteristics of the participants by group are displayed in Table 6. Languages spoken at home were English, Spanish, Cantonese, Tagalog, and Russian. The language mainly spoken at home was English (50-60%).

Table 6: Characteristics of Participants by Group (N=120)

	Control (n=30)		SLI (n=30)		Autism (n=30)	
	Frequency	%	Frequency	%	Frequency	%
Gender						
Male	13	43.33	18	60.00	21	70.00
Female	17	56.66	12	40.00	9	30.00
Ethnicity						
White	11	36.66	10	33.33	12	40.00
African American	5	16.66	6	20.00	4	13.33
Hispanic	10	33.33	12	40.00	11	36.66
Asian	4	13.33	2	6.66	3	10.00
Languages other than English spoken at home						
Spanish	9	30.00	12	40.00	11	36.66
Cantonese	2	6.66	1	3.33	2	6.66
Russian	1	3.33	-	-	1	3.33
Tagalog	2	6.66	1	3.33	1	3.33

Abbreviations: SLI, specific language impairment

There was a significant difference in mean Instrumental Performance Appraisal score among the three study groups (17.4 ±1.6 vs. 17.7 ±1.2 vs. 19.7 ±0.7, $p<0.001$). Further comparisons using Mann- Whitney U test showed that there was a significant difference in mean Instrumental Performance Appraisal score between the HFA and control groups, and between the SLI and control group ($p<0.001$), but not between the HFA and the SLI groups ($p=0.07$). For the other tests, there was a significant difference

among all the study groups (p<0.001, refer to Table 7). The distribution of the scores by

study group are displayed in Figures 3-7.

Table 7. Mean (SD) of Instrumental Performance Appraisal, Social Context Appraisal, Paralinguistic Decoding, Instrumental Performance, Affective Expression, Paralinguistic Codes Subtests (N= 120)

	Autism group (n=40)	SLI group (n=40)	Control group (n=40)	p –value[*]
IPA [a,b]	17.4 ±1.(	17.7 ±1.2	19.7 ±0.7	<.001
SCA [a,b,c]	6.8 ±2.2	10.6 ±1.3	19.5 ±0.7	<.001
PD [a,b,c]	7.0 ±2.4	16.5 ±1.2	19.2 ±1.0	<.001
IP [a,b,c]	15.7 ±2.	17.0 ±1.3	19.9 ±0.3	<.001
AE[a,b,c]	6.3 ±2.8	9.9 ±1.5	19.4 ±0.7	<.001
PC [a,b,c]	3.2 ±1.5	13.2 ±1.3	19.2 ±0.8	<.001

Abbreviation: SD, Standard deviation; SLI, Specific Language Impairment; IPA, Instrumental Performance Appraisal; SCA, Social Context Appraisal; PD, Paralinguistic Decoding; IP, Instrumental Performance; AE, Affective Expression; PC, Paralinguistic Codes
* Kruskal-Wallis Analysis of Variance test
[a] significant difference between autism group and control
[b] significant difference between SLI group and control
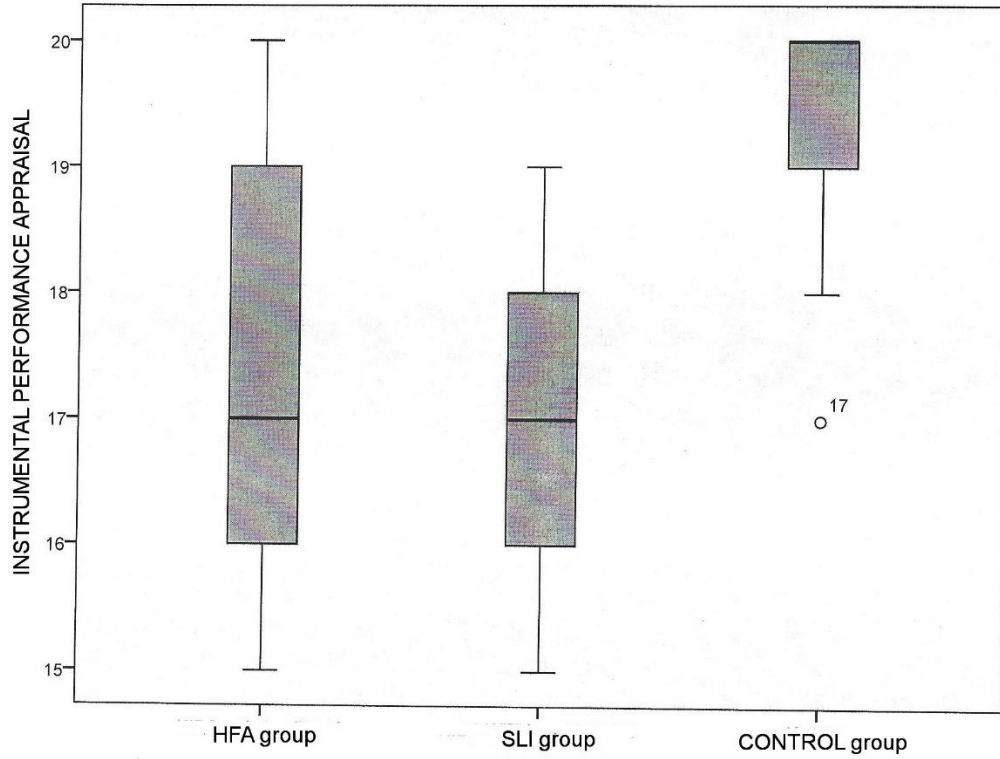[c] significant difference between SLI group and autism groups

Figure 3. Distribution of Instrumental Performance Appraisal Scores by Study Group
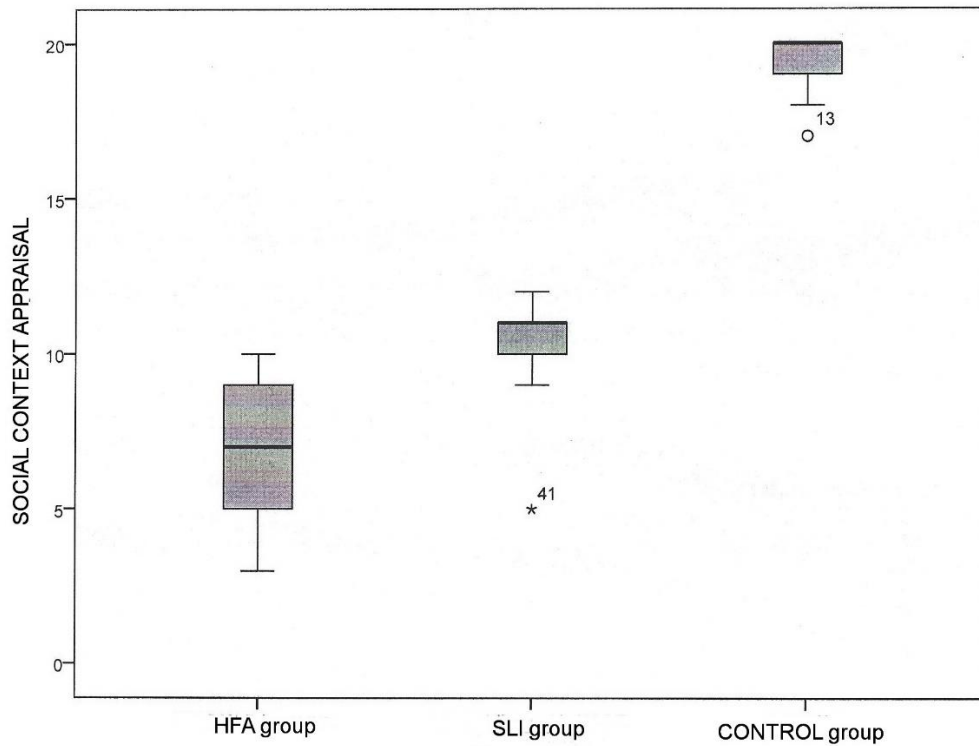

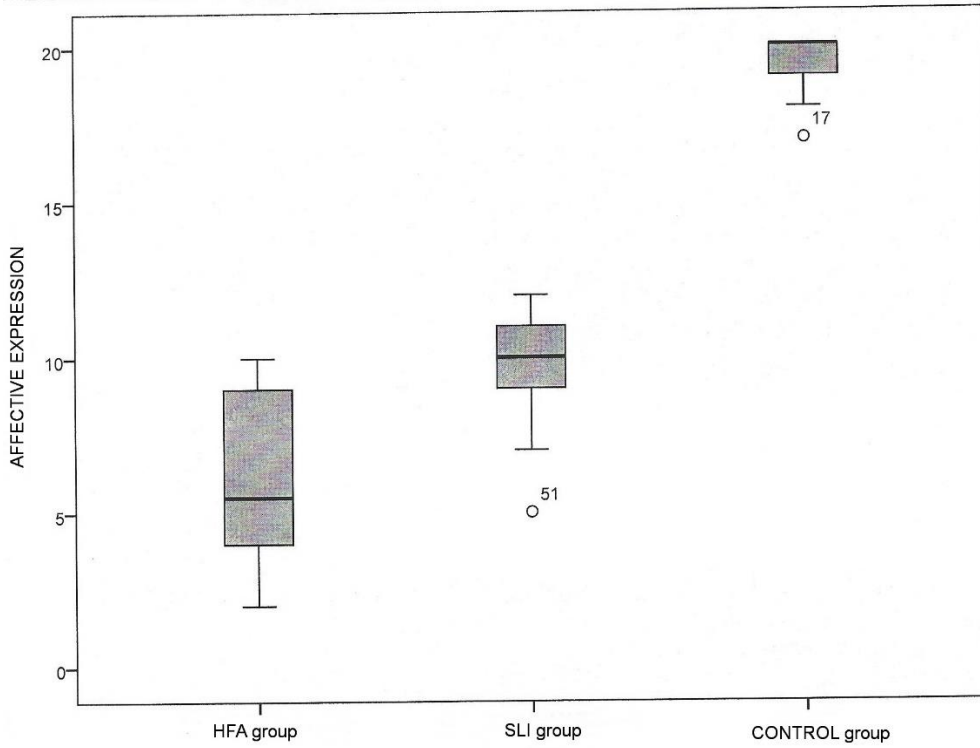Figure 4. Distribution of Social Context Appraisal Scores by Study Group

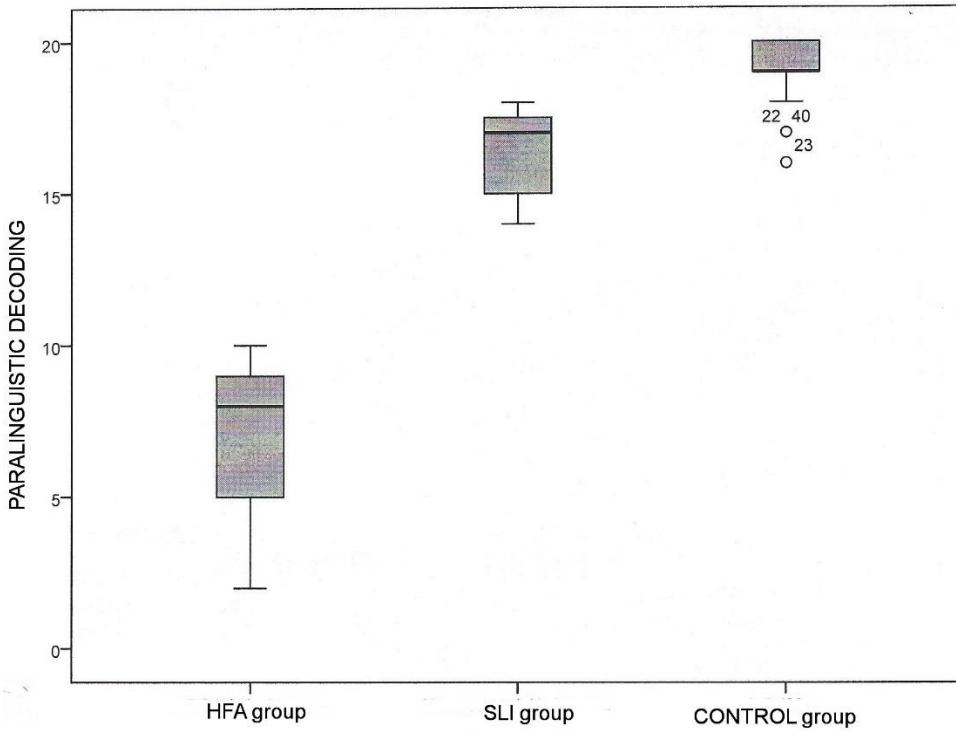Figure 5. Distribution of Affective Expression scores by Scores by Study Group

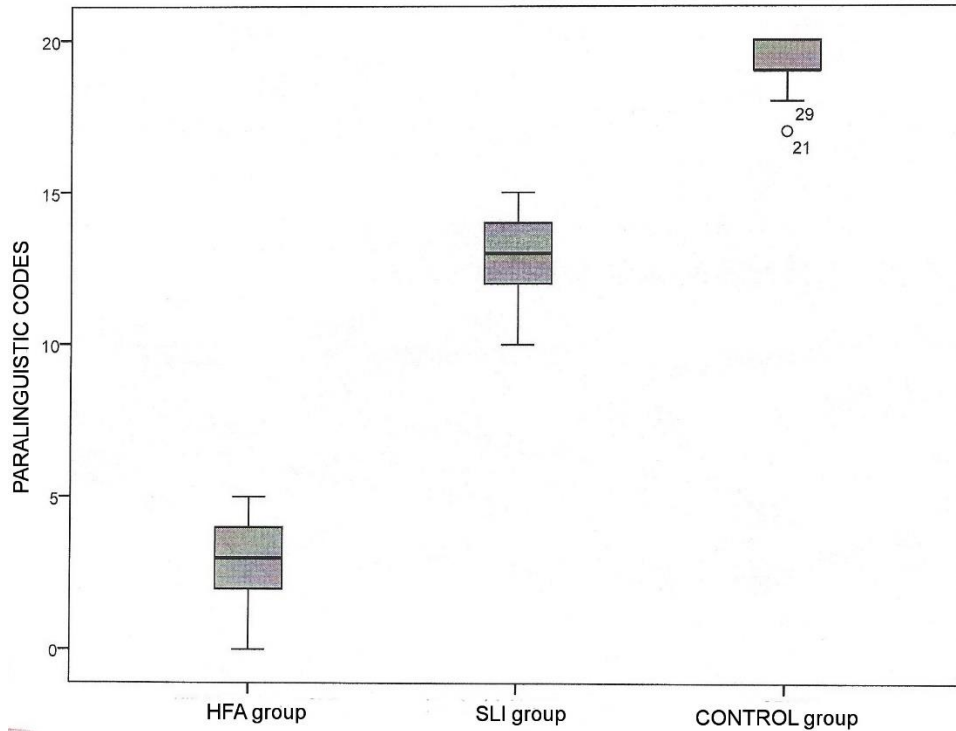Figure 6. Distribution of Paralinguistic Decoding Scores by Study Group

Figure 7. Distribution of the Paralinguistic Codes Scores by Study Group

Discussion

The purpose of this study was to better understand the pragmatic language profiles of students with HFA and those with pragmatic language difficulties related to SLI using a novel approach to assessing pragmatics using real-life video based testing. The current assessment tools tend to focus on identifying pragmatic language difficulties, such as (1) students' ability to respond or to initiate greetings and farewells, (2) responding to questions, (3) making requests of others, (4) asking for information or assistance, (5) asking a teacher or fellow student for clarification if they are confused, as well as (6) students' capacity for participation, initiation, or ending conversations. In addition, other skills which are explored in a cursory manner by current pragmatic language assessments include (6) turn-taking skills, (7) maintaining eye contact and body

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position, skills in appropriate facial expression, as well as (8) maintaining proper tone of voice in a conversation. While each of these elements, when considered in tandem, can provide strong evidence of pragmatic language impairment, many of these elements are missing from the standard assessment approach. Missing elements of current testing include higher level skills such as students' capacity for the use of sarcasm, humor, or irony as well as ability to read emotions or to make inferences from observations.

This research aimed to address 'higher-order' social language skills, particularly since students presenting with HFA often have little difficulty in performing adequately on traditional diagnostic skill-sets, but still have conversational and pragmatic impairments in higher-order communication and pragmatics. For this reason, such students often 'fall through the cracks' upon evaluation based on traditional assessments, but will still present with severe social deficiencies in the classroom.

Up to this point, students presenting with 'higher-order' pragmatic language difficulties, such as with understanding and using sarcasm, irony or reading facial expressions, could only be identified through a time-consuming and dynamic process. Such a requirement necessitates a major use of time in various dynamic observations, which may not provide educators or students with reliable results. A movement towards addressing these issues may include a diagnostic means by which students can be evaluated in a manner which is accurate, reliable and timely. The goal of this study was to produce an assessment tool which elicits both instrumental pragmatic skills and higher-level performance, both spoken and nonverbal via video prompts. In addition, the proposed assessment allowed for a debut of a novel evaluation of students' identification

and use of micro-expressions. Subsequently, new patterns in pragmatic language profiles of students with HFA and SLI were identified.

The results of this study revealed a significant and expected difference in performances between the control group of students and those with HFA and SLI. In analyzing data obtained on the Instrumental Performance Appraisal subtest, a significant gap in performance was expected but not identified. Students who present with HFA and those with SLI had similar results in instrumental in nature tasks (such as in judging or maintaining proper behavior in introductions, farewells, making requests, or other activities) as shown by results of the video-administered scenarios. Both groups were able to distinguish between appropriate and inappropriate social language uses in a sufficient manner to satisfy their basic needs for instrumental socialization. Such results support the idea that both groups of students, while impaired, have the capacity to socially operate independently in society and to tend to their basic needs.

As demonstrated by the Instrumental Performance subtest, few differences were found between students with SLI and those with HFA. However, when these two groups of students were administered the subtests which assessed their capacity for Social Context Appraisal and Affective Expression, significant differences were identified as compared to the control group regarding their ability to assess social situations, especially the thoughts or intentions of others, or to interpret sarcasm, irony, or humor. In addition, students with disabilities showed significant difficulty in the appropriate use of affect, including regret, support, their ability to pay compliments, or to express empathy, gratitude, or encouragement.

While a significant disparity was identified between the capacities shown by both the HFA group and those students with SLI when compared to the results of unimpaired students, major differences were also identified between the impaired groups. For instance, the HFA group performed poorly on subtests which required reading or the identification of facial expression (the Paralinguistic Decoding and Paralinguistic Signals evaluations). When compared to students who present with SLI, those with HFA showed significant deficiencies in the use of non-verbal language, the use and identification of appropriate facial micro-expressions, and gestures and prosody.

In a broader capacity, the study revealed that the HFA and the SLI groups of students performed well on both receptive and expressive facets of instrumental pragmatic language tasks, and were capable of demonstrating 'basic' conversational skills. Both groups of students showed significant difficulties with regard to high-order pragmatic language, such as their ability to understand the perspectives and attitudes of conversational partners. However, the HFA group distinguished itself from the SLI group by their difficulty in understanding and using nonverbal language and nonverbal cues, as well as facial expressions. This study showed that the CAPs could not only identify impaired pragmatic language performances but also differentiate between high-functioning autism versus pragmatic impairments related to specific language delays.

Strengths

Strengths of this study include the ethnic diversity and cultural background of the participants. However, the most notable benefit of the study was the unique test design consisting of videos which were true to life interactions. The videos were presented in a

relevant, life-like content, and the actors in the videos came from a wide variety of ethnic and cultural backgrounds. Verbal dialogue in the videos easy to listen to and understand and was presented at a rate that was controlled for speed without being unnaturally slow. Vocabulary used in the videos was appropriate to the ages of the study participants, and the real-life situations were those which might be expected to occur in environments with which the participants could be expected to be familiar.

Limitations

Notable limitations are demographic in nature: more male students participated in the autism group study, due to an inability to secure a strong number of female participants. However, this can be considered reflective of the increased likelihood of male students to present with autism based on current incidence rates. Additionally, we were unable to secure a large number of Asian students for either the language impairment or autism groups.

Summary

The clinical implications of this study hinge on its finding that both HFA students and those with SLI are able to comprehend and use instrumental pragmatic skills effectively. For this reason, any therapeutic intervention must move beyond such instrumental in nature tasks and instead focus on higher-order pragmatic skills. For both groups, understanding of and responding to subtle social cues (such as inferences, irony, sarcasm) will form an effective therapeutic 'starting point' than traditional methods of instrumental socialization. Further, the study results suggest that therapy goals for

students with HFA should focus on students' ability to recognize meanings of various

facial expressions as well as appropriate use of paralinguistic codes.

Our findings indicate that CAPs can serve as an effective means by which speech

language pathologists, and other related practitioners, can obtain greater understanding of

their students' needs, as well as areas of strength and weakness. Future studies on

younger children (ages 7 to 12) or older (ages 17 to 21) to better understand students'

pragmatic language profiles are needed. Additionally, further studies on student

performance and the effect of poor linguistic comprehension on pragmatic ability can be

beneficial in better understanding pragmatic language deficits. Finally, understanding

differences along cultural lines may help in understanding whether there are differences

among students who do not speak English as compared to their English-speaking

counterparts.

CHAPTER FOUR

DISCUSSION

This work has identified two primary factors: First, the CAPs test is a strong tool capable of effectively assessing a wide range of pragmatic skills, including comprehension of social language cues, or the 'intangible' area of higher level of pragmatic language skills such as sarcasm and empathy. One key area in which this assessment tool differs from current pragmatics tests is in respect to its ability to identify deficiencies reading facial expressions and micro-expressions, which is often based on the interpretation of subtle cues. While students who might not be identified as impaired with respect to their capacity to converse *in language*, they may nonetheless present with pragmatic language difficulties which in majority of cases cannot be identified by the current means of assessment. The CAPs is an effective and dynamic model of assessment which can compensate for the limitations of current means of assessment of pragmatics.

To this end, this work has explored video-based CAPs as a more effective means by which students with pragmatic language impairments can be identified. There are a wide range of subtle social cues, gestures, and actions which this work has identified as being crucial to social interaction, and in the execution of which students with autism or pragmatic language difficulties are deficient. CAPs is the only assessment tool that assesses students' understanding and use of primarily-physical social cues. In particular, CAPs subtests were judged to be effective in detecting deficiencies in subjects' decoding of facial micro-expressions or other expressions which were based on intonation or inflection. In addition, these subtests were judged to be of strong ability to evaluate for students' capacity for understanding complicated social situations when

presented with video based real-life social situations and by judging of students' actual facial expressions and affective language. In addition, by evaluating students' ability to *respond* with their own facial expressions (as well as their reactions, verbal and not), students' pragmatic language performance was judged to be a more dynamic means of evaluating affective abilities as compared to tests with static pictorial stimuli.

The clinical implications of this study hinge on its finding that both HFA students and those with SLI are able to comprehend and use instrumental pragmatic skills effectively. For this reason, any therapeutic intervention must move beyond such instrumental in nature tasks and instead focus on higher-order pragmatic skills. For both groups, understanding of and responding to subtle social cues (such as inferences, irony, sarcasm) will form an effective therapeutic 'starting point' than traditional methods of instrumental socialization. Further, the study results suggest that therapy goals for students with HFA should focus on students' ability to recognize meanings of various facial expressions as well as appropriate use of paralinguistic codes.

Conclusions and Future Directions

The CAPs is an effective means by which speech language pathologists, as well as other related practitioners, can obtain greater understanding of their students' needs, as well as areas of strength and weakness. We recommend conducting future studies on younger children (ages 7 to 12) or older (ages 17 to 21) to better understand students' pragmatic language profiles. Further studies on student performance and the effect of poor linguistic comprehension on pragmatic ability could be significantly beneficial in better understanding pragmatic language deficits. Finally, understanding differences

along cultural lines may help in understanding whether there are differences among students who do not speak English as compared to their English-speaking counterparts. Further studies on student performance and the effect of poor linguistic comprehension on pragmatic ability could be significantly beneficial in better understanding pragmatic language deficits. Finally, understanding differences along cultural lines may help in understanding whether there are differences among students who do not speak English as compared to their English-speaking counterparts.

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APPENDIX A

INFORMED CONSENT FORM - CONTROL GROUP

Dear Parent,

I am sending you this letter to inform you of a study that will be conducted this Summer-Fall by Loma Linda University/Rehabilitation Sciences and Communication Sciences Department entitled Clinical Assessment of Pragmatics: A Validation and Pilot Study.

The study will analyze the validity of a newly developed test that assesses students' pragmatic skills. Pragmatic skills are needed for appropriate and effective communication to take place. Any deficit in pragmatics results in significant disruption in the communication process. Simply, pragmatics can be described as a student knowing when to say what to whom and how much.

Pragmatic language deficits represent difficulties in correctly comprehending and expressively responding to situations in a social context. Individuals with deficits in pragmatics primarily struggle during conversation with others. Common difficulties include providing inappropriate responses, asking or not asking appropriate questions, taking turns during conversation, making eye contact and making appropriate facial expressions or gestures, and smoothly transitioning from one topic to another. Researchers are in need of volunteers between the ages of 12 and 14. Volunteers will be tested in the area of pragmatic language at no charge. Volunteers will be asked to watch short videos of various social situations and will be asked questions on what is an appropriate response to presented social situations. Volunteers will not be tested for longer than 50 minutes. Each participating volunteer will receive a $10 Target Gift Card.

Assessment sessions will take place in your home and will take no longer than 50

minutes and will be videotaped and recorded for accuracy of data collection.

RISKS: Participation in this study presents minimal risks to you and/or your

child, however potential risks may include but may not be limited to: fatigue, frustration,

breach of confidentiality Every effort will be made to guard against these risks including:

allowing your child a break if he/she becomes tired or frustrated, securing all recorded

data pertaining to your child, and special scheduling considerations in cases of hardship

as time allows.

BENEFITS: Participation in this study provides the following benefits for you

and/or your child: a 50 minute pragmatic language assessment session at no cost to you

at an estimated total value of $300.00-$500.00. This research may also help the speech-

language pathology community to develop evidence-based assessment procedures for

addressing the needs of children with autism and language impairment.

PARTICIPATION RIGHTS: Participation in this study is completely

voluntary. You may choose to withdraw your child from this study at any time without

prejudice.

CONFIDENTIALITY: Every effort will be made to protect your child's

identity. Information gathered from your participation will be labeled numerically and not

by name. All information including video/audio recordings and test protocols will be

kept in a secure location only accessible to research personnel. Medical history forms

will be shredded after it is determined your child meets the criteria for this study. The

information learned from this study may be published in a professional journal; however,

your child's name and other personally identifiable information will not be included in any publications.

ADDITIONAL COSTS: There are no additional costs to you or your child for participation in this study.

REIMBURSEMENT/INCENTIVES: Your child will receive a $10 Target gift card and a free individual pragmatic language assessment session. A private evaluation/assessment costs approximately $300.00-$500.00.

INFORMED CONSENT STATEMENT: By signing this form, I give permission for my child to participate in the study. I have read the contents of the informed consent and understand that I may withdraw my child from this study at any time without penalty. All of my questions regarding participation have been answered to my satisfaction. I may call Karen Mainess PhD, CCC/SLP at (909) 558-4998 X: 47224 or Adriana Belencaia, MS, CCC/SLP at (909) 724-8564 if I have any additional questions or concerns. If I am required to leave a message my call will be returned within a reasonable amount of time.

_____
Name of parent/guardian (Please print)

_____   _____
Signature of parent/guardian   Date

APPENDIX B

INFORMED CONSENT FORM – HIGH FUNCTIONING AUTISM GROUP

Dear Parent,

I am sending you this letter to inform you of a study that will be conducted this Summer-Fall by Loma Linda University/Rehabilitation Sciences and Communication Sciences Department entitled Clinical Assessment of Pragmatics: A Validation and Pilot Study**.**

The study will analyze the validity of a newly developed test that assesses students' pragmatic skills. Pragmatic skills are needed for appropriate and effective communication to take place. Any deficit in pragmatics results in significant disruption in the communication process. Simply, pragmatics can be described as a student knowing when to say what to whom and how much.

Pragmatic language deficits represent difficulties in correctly comprehending and expressively responding to situations in a social context. Individuals with deficits in pragmatics primarily struggle during conversation with others. Common difficulties include providing inappropriate responses, asking or not asking appropriate questions, taking turns during conversation, making eye contact and making appropriate facial expressions or gestures, and smoothly transitioning from one topic to another. Researchers are in need of volunteers with High Functioning Autism between the ages of 12 and 14. Volunteers will be tested in the area of pragmatic language at no charge. Volunteers will be asked to watch short videos of various social situations and will be asked questions on what is an appropriate response to presented social situations. Volunteers will not be tested for longer than 50 minutes. Each participating volunteer will

receive a $10 Target Gift Card. Assessment sessions will take place in your home and will take no longer than 50 minutes and will be videotaped and recorded for accuracy of data collection.

RISKS: Participation in this study presents minimal risks to you and/or your child, however potential risks may include but may not be limited to: fatigue, frustration, breach of confidentiality Every effort will be made to guard against these risks including: allowing your child a break if he/she becomes tired or frustrated, securing all recorded data pertaining to your child, and special scheduling considerations in cases of hardship as time allows.

BENEFITS: Participation in this study provides the following benefits for you and/or your child: a 50 minute pragmatic language assessment session at no cost to you at an estimated total value of $300.00-$500.00. This research may also help the speech-language pathology community to develop evidence-based assessment procedures for addressing the needs of children with autism and language impairment.

PARTICIPATION RIGHTS: Participation in this study is completely voluntary. You may choose to withdraw your child from this study at any time without prejudice.

CONFIDENTIALITY: Every effort will be made to protect your child's identity. Information gathered from your participation will be labeled numerically and not by name. All information including video/audio recordings and test protocols will be kept in a secure location only accessible to research personnel. Medical history forms will be shredded after it is determined your child meets the criteria for this study. The information learned from this study may be published in a professional journal; however,

your child's name and other personally identifiable information will not be included in any publications.

ADDITIONAL COSTS: There are no additional costs to you or your child for participation in this study.

REIMBURSEMENT/INCENTIVES: Your child will receive a $10 Target gift card and a free individual pragmatic language assessment session. A private evaluation/assessment costs approximately $300.00-$500.00.

INFORMED CONSENT STATEMENT:

By signing this form, I give permission for my child to participate in the study. I have read the contents of the informed consent and understand that I may withdraw my child from this study at any time without penalty. All of my questions regarding participation have been answered to my satisfaction. I may call Karen Mainess PhD, CCC/SLP at (909) 558-4998 X: 47224 or Adriana Belencaia, MS, CCC/SLP at (909) 724-8564 if I have any additional questions or concerns. If I am required to leave a message my call will be returned within a reasonable amount of time.

_____
Name of parent/guardian (Please print)

_____   _____
Signature of parent/guardian   Date

APPENDIX C

INFORMED CONSENT FORM – SPECIFIC LANGUAGE IMPAIRMENT

GROUP

Dear Parent,

I am sending you this letter to inform you of a study that will be conducted this Summer-Fall by Loma Linda University/Rehabilitation Sciences and Communication Sciences Department entitled Clinical Assessment of Pragmatics: A Validation and Pilot Study**.**

The study will analyze the validity of a newly developed test that assesses students' pragmatic skills. Pragmatic skills are needed for appropriate and effective communication to take place. Any deficit in pragmatics results in significant disruption in the communication process. Simply, pragmatics can be described as a student knowing when to say what to whom and how much.

Pragmatic language deficits represent difficulties in correctly comprehending and expressively responding to situations in a social context. Individuals with deficits in pragmatics primarily struggle during conversation with others. Common difficulties include providing inappropriate responses, asking or not asking appropriate questions, taking turns during conversation, making eye contact and making appropriate facial expressions or gestures, and smoothly transitioning from one topic to another. Researchers are in need of volunteers with Language Impairment between the ages of 12 and 14. Volunteers will be tested in the area of pragmatic language at no charge. Volunteers will be asked to watch short videos of various social situations and will be asked questions on what is an appropriate response to presented social situations.

Volunteers will not be tested for longer than 50 minutes. Each participating volunteer will receive a $10 Target Gift Card. Assessment sessions will take place in your home and will take no longer than 50 minutes and will be videotaped and recorded for accuracy of data collection.

RISKS: Participation in this study presents minimal risks to you and/or your child, however potential risks may include but may not be limited to: fatigue, frustration, breach of confidentiality Every effort will be made to guard against these risks including: allowing your child a break if he/she becomes tired or frustrated, securing all recorded data pertaining to your child, and special scheduling considerations in cases of hardship as time allows.

BENEFITS: Participation in this study provides the following benefits for you and/or your child: a 50 minute pragmatic language assessment session at no cost to you at an estimated total value of $300.00-$500.00. This research may also help the speech-language pathology community to develop evidence-based assessment procedures for addressing the needs of children with autism and language impairment.

PARTICIPATION RIGHTS: Participation in this study is completely voluntary. You may choose to withdraw your child from this study at any time without prejudice.

CONFIDENTIALITY: Every effort will be made to protect your child's identity. Information gathered from your participation will be labeled numerically and not by name. All information including video/audio recordings and test protocols will be kept in a secure location only accessible to research personnel. Medical history forms will be shredded after it is determined your child meets the criteria for this study. The

information learned from this study may be published in a professional journal; however, your child's name and other personally identifiable information will not be included in any publications.

ADDITIONAL COSTS: There are no additional costs to you or your child for participation in this study.

REIMBURSEMENT/INCENTIVES: Your child will receive a $10 Target gift card and a free individual pragmatic language assessment session. A private evaluation/assessment costs approximately $300.00-$500.00.

INFORMED CONSENT STATEMENT: By signing this form, I give permission for my child (or ward) to participate in the study. I have read the contents of the informed consent and understand that I may withdraw my child from this study at any time without penalty. All of my questions regarding participation have been answered to my satisfaction. I may call Karen Mainess PhD, CCC/SLP at (909) 558-4998 X: 47224 or Adriana Belencaia, MS, CCC/SLP at (909) 724-8564 if I have any additional questions or concerns. If I am required to leave a message my call will be returned within a reasonable amount of time.

_____
Name of parent/guardian (Please print)

_____   _____
Signature of parent/guardian   Date