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The use of the Communication Checklist - Adult (CC-A) for assessing the communication abilities of individuals post traumatic brain injury

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Dated: 14th November, 2013

The use of the Communication Checklist - Adult (CC-A) for assessing the communication abilities of individuals post traumatic brain injury.

David Bernard FitzGerald

A report submitted in Partial Fulfilment of the Requirements for the Award of Bachelor of Speech Pathology Honours, Faculty of Health, Engineering and Science, Edith Cowan University.

Submitted 14th November, 2013

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Abstract

Background and aims: Standardised and non-standardised assessments are used in speech pathology to evaluate an individual's communication abilities post traumatic brain injury (TBI; e.g. Turkstra et al., 2005b). However, valid, reliable and norm-referenced standardised assessments that examine functional communication abilities of individuals post TBI outside of the clinical environment are limited. This study sought to investigate the validity of the Communication Checklist - Adults (CC-A; Whitehouse & Bishop, 2009), a caregiver questionnaire that assesses the communication abilities of individuals post TBI.

Method: The project recruited 14 participants post TBI with varying communicative impairment severities. Each participant completed a routine communication assessment (RCA) which involved administration of a range of assessments. These were 1) the Communication Activities of Daily Living - Second Edition - (CADL-2; Holland, Frattali, & Fromm, 1999), a clinician-administered language assessment that generates percentile scores, with a higher percentile indicating better performance; 2) participation in a conversation which was analysed using Prutting and Kirchner's pragmatic protocol (PKPP; Prutting & Kirchner, 1987); 3) collection of a monologic discourse sample through two single picture descriptions and description of two picture sequences. Discourse samples were transcribed and a composite of linguistic and pragmatic abilities were generated using measures derived from the Systematic Analysis of Language Transcription (SALT; Miller & Iglesias, 2008), where higher totals on test scoring indicated greater language difficulties. A caregiver or relative of the individual with TBI was also asked to complete the CC-A regarding the individual's communication ability. The CC-A generated z scores that provided an overall measure of language abilities, as well as subscale measures of linguistic (Language Structure subscale) and pragmatic (Pragmatic Skills subscale and Social Engagement subscale) competence. Lower scores indicated greater difficulties.

Results: Pearson's correlation coefficients identified a strong positive correlation between the CC-A Overall z-scores and the CADL-2 percentile scores ($r(14) = .70, p = .01$). There were also statistically significant negative correlations between the CC-A Language Structure z-scores and the SALT Linguistic Composite totals, $r(14) = -.65, p = .01$, as well as between the CC-A Pragmatic Skills z-scores and SALT Pragmatic Composite totals, $r(14) = -.53, p = .05$. There were statistical trends for an association between CC-A Social Engagement z-scores and the PKPP ratings ($r(14) = .48, p = .08$) and between Social Engagement z-scores and the SALT Pragmatic Composite totals ($r(14) = -.40, p = .15$), but these correlations did not achieve statistical significance.

Discussion: The results of this study provide preliminary evidence that the CC-A is a valid measure of the communication difficulties experienced by individuals with TBI. Future studies that assess a larger number of patients with a greater range of difficulties, will build on the findings presented here.

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Table of Contents

Abstract.....	iv
Acknowledgements.....	vi
Introduction.....	1
Traumatic brain injury	1
Presentation of TBI.....	1
TBI and functional communication	2
Communication assessment of TBI	3
Non-Standardised assessment of TBI	4
Standardised assessment of TBI	6
Functional Communication assessment of TBI.....	7
The Communication Checklist - Adult.....	7
Study Aim	9
Methods.....	9
Participants.....	9
Materials	12
Communication Activities of Daily Living - Second Edition	12
Monologic discourse sample.....	13
Prutting and Kirchner Pragmatic Protocol.....	13
Communication Checklist - Adult	13
Procedure	14
Data analysis	16
Results.....	17

Table of Contents

Discussion	21
Limitations	23
Sample size	23
Spread of impairment severity	23
Number of abandoned communication units	24
Communication Activities of Daily living - Second Edition.....	24
Broader implications	24
Areas of future research	25
Conclusion	26
References.....	27
Appendix.....	32

The use of the Communication Checklist - Adult (CC-A) for assessing the communication abilities of individuals post traumatic brain injury.

In Australia, the incidence of traumatic brain injury (TBI) is approximately 1 in 45 individuals in the general population (O'Rance & Fortune, 2007). TBI can have a substantial impact on an individual's ability to participate in social and functional everyday communication interactions (Struchen, Clark, Sander, Mills & Kurtz, 2008a). There is a critical need for assessments to provide information on an individual's communication in these functional settings in order to guide speech pathology intervention.

Traumatic brain injury (TBI)

TBI is an acquired brain injury resulting from rapid acceleration and deceleration (e.g. injuries associated with car crash, head contact during impact sports such as Australian Rules Football, Rugby and Boxing) or from open head injuries such as penetration of the skull by a missile or debris (e.g. injuries from explosions in the workplace, injuries sustained in a car crash) (Turkstra et al., 2005b). TBI is a leading cause of death and disability worldwide, with young adults and adolescents at greatest risk (Hart et al., 2003; Shames, Treger, Ring & Giaquinto, 2007). Acute care and rehabilitation of individuals who sustain a TBI have a substantial economic impact on the country's healthcare system. In addition to medical costs, individuals with TBI may need to modify their living accommodation, experience a reduced level of independence and encounter challenges returning to work or gaining new employment (Khan, Baguley & Cameron, 2003). The expected lifetime cost of new instances of TBI in Australia is estimated to be between \$2.5 million to \$4.8 million (Access Economics, 2009).

Presentation of TBI

The presentation of communication abilities and impairment in the TBI population can vary widely from individual to individual. Impairment is often related to the region and

the extent of damage caused by the injury to the brain (Hux, 2011). Due to the typically multi focal nature of TBI, especially where rapid acceleration/deceleration forces are involved, cognitive communication disorders are most commonly observed (McDonald, Togher & Code, 1999). If the language dominant left hemisphere is undamaged, an individual post TBI may present with intact adherence to language rules but exhibit cognitive challenges that cause their communication to be inefficient (McDonald et al., 1999). Although uncommon, aphasia in isolation has been observed (McDonald et al., 1999).

Cognitive communication difficulties stem from impaired cognitive functions impacting on the language system. The underlying cognitive impairments include the areas of awareness, problem solving, insight, attention, memory, learning, linguistic access, organisation and retrieval processes and processing systems which relate to an individual's ability to have efficient and effective functional communication (Hughes & Orange, 2007). Due to these cognitive impairments, the communicative difficulties experienced by people with TBI have been described as complex and heterogeneous reflecting a wide array of neurophysical and neuropsychological impairments (McDonald et al., 1999). Individuals post TBI are commonly observed to experience enduring effects on linguistic, extralinguistic and paralinguistic function especially relative to complex tasks that require cognitive flexibility (Blyth, Scott, Bond & Paul, 2012; Hux, 2011). This can lead to difficulties with receptive and expressive language, social engagement and pragmatic communication (Hughes & Orange, 2007).

TBI and functional communication

TBI may affect an individual's functional communicative ability, that is their ability to communicate in day to day activities. Functional communication requires the integration of cognitive, articulatory and linguistic abilities that allow the communication or exchange of information between individuals during everyday tasks (Drummond & Boss, 2004).

Functional communication difficulties can potentially have an adverse effect on individual's communication efficiency and social integration in addition to a secondary impact on emotional functioning and quality of life (Degeneffe & Lee, 2010; Hoofien, Gilboa, Vakil & Donovan, 2001).

Participation in basic functional communication activities associated with quality of life is often seen to be impeded in an individual post TBI. For example the ability to take part in education (school, university), obtain and maintain employment (either in a pre TBI career or in a new area of employment), participate in community based activities and socialise with friends and family are frequently observed to be areas of difficulties for this population (Hughes & Orange, 2007; Struchen et al., 2008b).

Rehabilitation is often focused toward assisting individuals to integrate back into their community in terms of employment and participation in their social and family circles to maximise their quality of life (Larkins, Worrall & Hickson, 2004). Clinical assessment of the individual's communicative ability is one part of this process. The aim of assessment is to determine the type and severity of impairment which may prevent or reduce an individual's return to their environment and participation in daily vocational, social and community activities (Hux, 2011; Threats & Worrall, 2004). According to Ponsford, Sloan and Snow (2013), assessment at the rehabilitation stage of recovery provides information that is essential for planning intervention as well as developing relevant goals both clinically and functionally for the client and their family. Additionally, clinical assessment can provide an avenue through which clinicians can gain an insight into how and where a client's communication abilities are progressing, if at all (Turkstra, Coelho & Ylvisaker, 2005a).

Communication assessment of TBI

Currently there are numerous standardised and non-standardised assessments used to evaluate communication abilities post TBI. This point was demonstrated in a study that

surveyed 30 Speech Pathologists to explore the assessment practices of Speech Pathologists working with individuals with TBI (Coelho, Ylvisaker & Turkstra, 2005; Turkstra et al., 2005a; Turkstra et al., 2005a). Clinicians were asked to identify both standardised and non-standardised assessment tools used to evaluate the communication of individuals post TBI.

The results identified 69 different standardised assessments used for this purpose. The assessments included comprehensive, standardised tests together with screening tests that focused on speech, language, pragmatic ability and cognitive functions (Turkstra et al., 2005a). Additionally, 28 different non standardised procedures or tasks were identified as being used for the assessment of individuals with TBI (Coelho et al., 2005). This ranged from observation, to discourse analysis, to administration of subtests from published assessment protocols.

In the same study, a survey of four test publishers and four test distributors identified 40 standardised tests recommended to assess the communication abilities of individuals with TBI (Turkstra et al., 2005b). This included assessments specifically designed for TBI, traditional language impairment based tests, a screening test for Alzheimer Disease, a test of right hemisphere function, tests based on a developmental language model and neuropsychological tests of component processes including speed of processing, attention and memory (Turkstra et al., 2005b).

Non-Standardised assessment of TBI

Non-standardised assessments are used to examine an individual's performance in areas that either have not or cannot be standardised on a normal or clinical sample (Coelho et al., 2005). While allowing assessment of areas and abilities that are not standardised, they can examine an individual's communication across real world contexts (Coelho et al., 2005). Non-standardised assessments such as informal checklists and collaborative hypothesis testing can also assist in the evaluation of cognitive and communication demands that result

within relevant contexts and observe which, what and how everyday communication partners use supports to facilitate communication (Coelho et al., 2005).

The broader context of discourse analysis is one type of non-standardised assessment. Impaired discourse has been identified as a hallmark of post-TBI cognitive-communication impairment because of the central function discourse has in everyday communication (Lê, Mozeiko & Coelho, 2011). People with TBI may experience a reduction in community participation and an increase in social isolation due to deficits in the ability to competently engage in discourse with family, friends and unfamiliar listeners (Jorgensen & Togher, 2009). However, discourse is an area that has not and arguably cannot be standardised (Coelho et al., 2005). Nonetheless, discourse analysis has been recommended as a supplement to clinic bound language and neuropsychological testing. This approach allows greater opportunity to observe an individual's communication during activities that are contextually relevant to the events outside of the clinical environment (Mozeiko, Lê, Coelho, Kruegar & Grafman, 2011).

Two broad categories of discourse are generally identified in the literature, monologic and interactive or conversational discourse (Perkins & Body, 2004). Monologic discourse includes descriptive, narrative and procedural sampling (Coelho et al., 2005). Interactional or conversational discourse examines the way in which individuals communicate in real life, everyday communication contexts (Lê et al., 2011). However, like many non-standardised approaches discourse analysis can be time consuming and can require an experienced clinician to gain accurate and reliable information (Lê et al., 2011; MacDonald & Johnson, 2005; Vogel, Maruff, & Morgan, 2010).

Pragmatic rating scales are another method used to analyse the discourse samples of individuals post TBI (Coelho et al., 2005). They can provide the opportunity to observe difficulties related to real-world communication interactions such as turn taking, topic selection and maintenance, use of a variety of speech acts, paralinguistic aspects such as use

of intonation, intelligibility and fluency and nonverbal aspects such as gesture and facial expression. This is important to the TBI population because many individuals will present with considerable difficulty engaging in everyday interactions due to the impact of cognitive communication impairment on pragmatic elements of interactions, rather than linguistic impairment examined on most standardised assessment (Angeleri et al., 2008). However, pragmatic rating scales can be limited by their inability to represent constant variables and their requirement for examiners to be trained in their administration to achieve satisfactory reliability (Coelho et al., 2005).

Standardised assessment of TBI

In contrast to non-standardised assessment, standardised assessments are frequently time efficient, employ clear and explicit procedures for administration and include normative data for comparison to a representative population relevant to the test (Ponsford et al., 2013). The focus of standardised assessment can include the measurement of impairment, outcome of therapy and limitations to activities and participation (Turkstra et al., 2005a).

Additionally, identification of environmental and personal concerns can be targeted by standardised testing (Turkstra et al., 2005a). For example, functional assessments encourage the evaluation of an individual's abilities in communication activities related to everyday functioning. Other assessments such as aphasia batteries, focus on linguistic impairment by assessing an individual's linguistic skills such as content, fluency, auditory comprehension, repetition, naming, reading and writing and non-linguistic skills such as calculation, problem solving, drawing and praxis.

In 2005 the Academy of Neurologic Communication Disorders and Sciences (ANCDs) reviewed available assessment tools and developed guidelines regarding standardised assessment of communication abilities post TBI (Turkstra et al., 2005b). The review included surveying Speech Pathologists and test publishers, and evaluating test

manuals, published literature and expert opinion. Thirty one assessments were reviewed for inter-rater reliability, internal consistency, test-retest reliability, construct validity, concurrent validity and predictive validity. From this, five standardised, norm referenced tests for assessment of communication abilities of individuals above the age of 18 years with TBI were identified as meeting the majority of the above criteria. The five tests suggested by the review included assessments of impairment and functional communication and included: The Western Aphasia Battery- Revised (WAB-R; Kertesz, 2006), The Communication Activities of Daily Living - Second Edition - (CADL-2; Holland, Frattali, & Fromm, 1999), American Speech-Language Hearing Association Functional Measure Assessment of Communication Skills (ASHA FACS; Frattali, Thompson, Holland, Wohl & Ferketic, 1995), Functional Independence Measure (FIM; Randolph, 2001), and Repeatable Battery for the Assessment of Neuropsychological Status (Uniform Data System for Medical Rehabilitation, 1996).

Functional communication assessment of TBI

There is a dearth of standardised assessments that examine functional communication abilities of individuals post TBI in real life contexts (e.g. Turkstra et al., 2005b; Hughes & Orange, 2007; Larkins et al., 2004). Additionally, the dependence and focus on the clinical environment potentially reduces an assessment's ability to fully represent an individual's everyday communication abilities (Coelho et al., 2005; Burgess, Alderman, Evans, Emslie, & Wilson, 1998; Turkstra et al., 2005b; Wilson, 2003). To maximise quality of life, communication assessment needs to provide appropriately focused information to identify areas of strength and weakness of an individual's functional communication ability. This facilitates the development of goals that are important to the client and their caregivers while assisting clinicians in the planning and implementation of intervention.

The Communication Checklist - Adult

Limitations such as insensitivity to everyday communication abilities and longer administration times are often associated with traditional standardised and non-standardised forms of testing (Whitehouse & Bishop, 2009). Informant questionnaires may provide a time efficient way of obtaining information about individuals in real life contexts as a supplement to longer clinic based assessment (Arciniegas, Zasler, Vanderploeg & Jaffee, 2013).

The Communication Checklist - Adult (CC-A; see appendix A for CC-A response form) is a multi-choice caregiver/relative-completed questionnaire designed to assess an individual's functional communication. Individual's communication abilities are targeted across three areas; Language Structure which examines linguistic aspects of communication such as semantics, speech and syntax, Pragmatic Skills which assesses expressive pragmatic behaviours and Social Engagement which considers nonverbal aspects of interactions and interests (Whitehouse & Bishop, 2009).

The CC-A was originally standardised using a sample of 189 relatives of adults with no language impairment. The assessment was then pilot tested with a cohort of 17 people with TBI. From this cohort, participant responses to the CC-A were compared to responses from their caregivers and found to be sensitive (Whitehouse & Bishop, 2009). Additionally, CC-A data was collected from Speech Pathologists for 12 of these subjects. Significant agreement was found between the ratings of the caregiver/relative of the individual and ratings of the Speech Pathologist (Whitehouse & Bishop, 2009). Comparison of the CC-A to established standardised and non-standardised assessment protocols has yet to be examined.

Clinically, the CC-A may provide Speech Pathologists with an additional method of assessment which would provide information about an individual's communication abilities in contexts outside of the clinical environment. It also utilises the unique and intimate point of view that a caregiver/relative gains through their everyday observation of the individual

and their communication across activities of daily living. This also allows a greater breadth of information to be considered when planning client centred goals and therapy, facilitating intervention that is meaningful and relevant to the client and their caregiver/relatives.

Study Aim

Considering the dearth of tests that assess functional communication of individuals with TBI in real life contexts, this project aimed to determine the validity of the CC-A by comparing it to an established standardised tool and non-standardised discourse measures. It is expected that overall CC-A profiles of participants post TBI will be significantly correlated to CADL-2 percentile ranks and syntactic SALT measures of monologic discourse samples. Additionally, CC-A Pragmatic Skills and CC-A Social Engagement Subscales scores will show significant correlation to pragmatic SALT measures of a monologic discourse samples and ratings on the Prutting and Kirschner Pragmatic Protocol.

Methods

Participants

Fourteen participants were included in this study. All were recruited from Royal Perth Hospital (RPH) Shenton Park Campus and participants were deemed appropriate for this study based on the following criteria:

- 18 years of age or older;
- Ability to participate in the assessment session in English;
- Admission to hospital with a traumatic brain injury as confirmed by treating medical team; and
- Cognitive capacity to provide informed consent (as judged by the medical team).

Thirteen participants had been diagnosed with TBI. A further participant (Participant 8), who had been thrown from a horse, showed no neurological impairment through imaging,

but had experienced severe concussion and showed signs of neurological injury consistent with TBI, such as slower processing speeds, memory loss and slurred speech. The medical care for this patient was consistent with treatment for TBI. This participant also had a history of TBI during childhood but there was no evidence to suggest that this event had caused lasting neurological deficit other than mild hearing loss in one ear. All other participants had no history of neurological damage or disease prior to their TBI. Thirteen participants had English as their first language. The remaining participant (Participant 11), a native Swedish speaker, was fluent in English prior to sustaining the TBI. Participant details are presented in Table 1.

For each participant, one relative or caregiver was recruited to complete the CC-A about the individual with TBI. The inclusion criteria for relative/caregivers were:

- 18 years of age or older;
- Ability to read and write in English (to a level of 12 years or older); and
- Have regular contact with the participant (at least three to four days per week for at least three months).

Table 1. Participant details.

Participant ID	Gender	Age at onset	Time post onset (years)	Injury event	Nature of Injury
1	Male	56	0.53	Participant Fell 3-4m from patio.	Diffuse, right subfrontal subarachnoid haemorrhage & mild effacement of right hemispheric sulci.
2	Male	65	0.43	Fell from a stationary truck.	Right temporal subdural haematoma.
3	Male	46	0.49	Fell and hit the ground.	Multifocal subarachnoid and parenchymal haemorrhage.
4	Male	68	0.09	Fell from a ladder.	Bilateral subarachnoid haemorrhagic contusions involving the temporal and parietal lobes.
5	Male	20	0.93	Fell from skateboard onto road.	Left occipital extradural haemorrhage.
6	Male	34	4.29	Quad bike accident.	Extensive right frontal subarachnoid haemorrhage with cerebral oedema & tentorial herniation.
7	Male	17	1.39	Fell off mini-bike.	Left & right frontal & temporal lobe contusions.
8	Male	24	0.06	Fell from a horse.	Concussion - No injury visible on CT scan however symptoms of Neurological insult observed.
9	Male	35	1.70	Push bike collided with moving car.	Diffuse axonal damage in superior frontal gyrus. Small intraventricular haemorrhage within the left occipital lateral ventricle.
10	Male	54	0.06	Car collided with participant.	Bilateral parietal subdural & extradural haemorrhage.
11	Female	34	0.27	Fell while walking down stairs.	Extensive bilateral intraparenchymal contusions with bilateral Subdural Haematoma & subarachnoid haemorrhage
12	Male	24	0.27	Participant motor bike collided with car.	Right intraparenchymal haemorrhage small left frontal & temporal parenchymal contusion & right parietal subgaleal haematomas. Right basal ganglia parenchymal haemorrhage with intraventricular haemorrhage left temporal pole haemorrhagic contusion.
13	Male	31	0.24	Truck collided with participant	Brain and intraparenchymal herniation. Subdural haematoma and subarachnoid haemorrhage superior to the frontal defect.
14	Male	39	0.06	30kg bar fell onto participant's head	Subdural haematoma involving left frontoparietal region & right frontotemporal regions. Subarachnoid haemorrhages in the bilateral sylvian fissure & frontal regions & small contusions in the bilateral deep frontal lobes.

Materials

The current study utilised four communication assessments. These were the CADL-2 (Holland et al., 1999), the collection of a monologic discourse sample including analysis using SALT (Miller & Iglesias, 2008) and the collection of a sample of conversation including analysis using the Prutting and Kirchner Pragmatic Protocol (PKPP; 1987), and the completion of the CC-A (Whitehouse & Bishop, 2009) by a caregiver or relative of the person with TBI.

Communication Activities of Daily Living - Second Edition. The CADL-2 (Holland et al., 1999) is an individually administered assessment that evaluates communication activities in seven areas: reading, writing, and using numbers; social interaction; divergent communication; contextual communication; nonverbal communication; sequential relationships; and humour/metaphor/absurdity. The assessment seeks to evaluate the functional communication abilities of an individual without expressly targeting linguistic impairment. The CADL-2 was standardised on a sample of 175 individuals with neurogenically based communication disorders including TBI. Raw scores are converted to a percentile rank, with a higher percentile indicating better performance. The CADL-2 has excellent validity, as well as a high degree of content- (.93), time- (.85) and inter-rater (.99) reliability.

The CADL-2 was selected as the standardised clinician-administered assessment for three reasons. First, it was decided that a functional measure would be more relevant to assessing the CC-A in this first instance as the main theme of CC-A itself is to assess facets of functional communication. Second, it was recommended by the above review as having demonstrated inter-rater reliability, internal consistency, test-retest reliability, construct validity, concurrent validity and predictive validity. Lastly, the CADL-2 is a standardised assessment that is widely used for the assessment of communication abilities of individuals with TBI, making it an ideal choice to compare with CC-A scores.

Monologic discourse sample. In order to elicit a monologic discourse sample, participants were presented with four different picture stimuli taken from Nicholas and Brookshire (1993). Two pictures contained a single scene, each of which had a central theme with interactions among pictured elements. The other two stimuli were picture sequences, each of which contained six scenes that followed a simple narrative. The monologic discourse samples were analysed using the SALT computer software (Miller & Iglesias, 2008).

Prutting and Kirchner Pragmatic Protocol. The PKPP (Prutting & Kirchner, 1987) was completed immediately after each assessment. The PKPP was selected for this study given the utility of the tool for evaluating a range of pragmatic aspects of language. It encompasses rating aspects of linguistic function as well as features of communication that relate to principles governing communication. The protocol comprises a list of 30 pragmatic parameters (or ‘communicative acts’) and a trained rater assesses the appropriateness of a participant’s discourse for each of these acts. Each pragmatic parameter is rated on a scale of appropriate, not appropriate and no opportunity to observe. Judgement of whether or not a behaviour is deemed appropriate is based on the impact the pragmatic behaviour has on the interaction.

The monologic discourse sample and the sample of conversation were recorded using a Sony IC digital voice recorder.

Communication Checklist - Adult. The CC-A (Whitehouse & Bishop, 2009) assesses an individual’s functional communication abilities through caregiver responses. The assessment is a caregiver/relative-completed questionnaire containing 70 multi-choice items and it takes approximately 5-15 minutes to complete (Whitehouse & Bishop, 2009). Communication abilities are targeted across three areas: ‘Language Structure’, including linguistic aspects of speech such as semantics, speech fluency and syntax; ‘Pragmatic Skills’, including expressive pragmatic behaviours; and ‘Social Engagement’, including non-verbal aspects of communication and interests. Items corresponding to these three scales were summed and then converted to a z-score based on a

standardisation sample of 189 healthy adults in the United Kingdom. A lower z-score on these scales represents a greater level of impairment. Each of the three scales has a high degree of internal consistency (all Cronbach's alpha values $> .9$).

Preliminary data published in the CC-A manual indicates there is a strong correlation between the overall z-scores, scores of Speech Pathologists and caregivers of individuals post brain injury ($r(17) = .63, p < .05$). The CC-A has been shown to be sensitive to the structural and pragmatic language difficulties experienced by adults with autism and Specific Language Impairment as well as their relatives (Whitehouse & Bishop, 2009), but there have been no validity studies for individuals with TBI.

Procedure

Recruitment of participants followed a purposive sampling approach. Potential research participants were identified and approached by the treating clinicians at RPH Shenton Park, who verbally discussed the proposed research project with the individuals with TBI and their caregivers. The Student Researcher then organised a follow up meeting or phone call with those individuals who were interested in participating in the research project. This follow up consisted of the Student Researcher introducing himself and other researchers involved in the project, and outlining the project details. After this meeting, if potential participants stated a desire to be involved in the project, the Student Researcher organised an assessment appointment in the Speech Pathology Department at RPH Shenton Park. Consent was obtained from the individual with TBI at the beginning of each routine communication assessment (RCA). Each assessment session lasted approximately 45 to 60 minutes per participant. This procedure was approved by the Human Research Ethics Committees of Royal Perth Hospital and Edith Cowan University.

The RCA commenced with a conversation of between 5 - 10 minutes between the student researcher and participants with TBI. Following this, a monologic discourse sample was obtained by presenting participants with the Nicholas and Brookshire (1993) stimuli. Participants were asked to

describe what was happening in each of the picture stimuli and to talk for as long as they could. Once the participant had stopped talking, they were given one prompt from the Student Researcher of “can you tell me anymore?”. Once the participant had stopped talking for a second time or indicated they had no more to say the next picture was presented with the same instructions. On completion of the picture description task, participants were administered the CADL-2 (Holland et al., 1999) by the Student Researcher. At the conclusion of the CADL-2 assessment, caregivers were either physically provided or posted the CC-A questionnaire, accompanied with a return envelope addressed to Dr Natalie Ciccone at Edith Cowan University (ECU) Joondalup.

Recordings of the monologic discourse samples were taken and segmented in Communication units (C-units) which are defined as an utterance that contains a main clause, or main clause with a subordinate clause (Miller & Iglesias, 2008). A main clause can stand alone where a subordinate clause depends on the main clause to make sense.

Transcription was completed according to procedures outlined in Systematic Analysis of Language Transcripts (SALT, Miller & Iglesias, 2008). The CC-A provides a measure of linguistic (Language Structure subscale) and pragmatic (Pragmatic Skills and Social Engagement subscales) abilities. To examine the concordance between the CC-A and the monologic discourse sample, three linguistic and three pragmatic measures were derived from the latter assessment. These specific measures were chosen as they map directly onto the CC-A subscales. Additionally, by limiting the number of analyses performed, the strength of any statistically significant relationships is strengthened.

The following three measures of structural language were coded on each transcript according to the guidelines of Miller and Iglesias (2008):

- Word level errors: refers to the number of incorrect words used by the participant;
- Omitted words: refers to the total number of grammatical errors involving an omitted word; and

- Omitted bound morphemes: refers to the total number of grammatical errors involving an omitted bound morpheme (e.g. past tense marker).

The following three measures were obtained to assess pragmatic abilities. The first measure (number of abandoned C-units) was coded on each transcript according to the guidelines of Miller and Iglesias (2008).

The following two measures were derived specifically for the current study:

- Number of abandoned C-units: refers to the total number of C-units within the sample that the speaker has abandoned before the completion of the C-unit;
- Number of utterances with irrelevant interpretations: refers to the amount of C-units containing interpretations that were unrelated to the assessment stimuli.;
- Number of utterances that were pragmatically inappropriate or included pragmatically inappropriate comments: refers to the amount of C-units that were pragmatically inappropriate to the task or included comments that were pragmatically inappropriate to the context of the assessment.

Discourse samples were also analysed using the Prutting and Kirchner Pragmatic Protocol (PKPP; 1987), which provided a further measure of pragmatic ability. The outcome measure was the percentage of appropriate ratings (PKPP ratings), calculated by the following formula: (Number of pragmatic parameters deemed 'appropriate'/Total number of pragmatic parameters) X 100.

Data analysis

The first step in the analyses was to create composite measures from SALT analyses. A Linguistic Composite was created by summing the number of word level errors, omitted words, and omitted bound morphemes. A Pragmatic Composite was created by summing the number of abandoned C-units, the number of utterances with irrelevant interpretations, and the number of pragmatically inappropriate utterances.

Pearson's correlations were then used to examine the associations between the CC-A Overall and subscale z-scores and the four measures derived from the RCA (1. CADL-2. 2. Linguistic Composite totals, 3. Pragmatic Composite totals, and 4. PKPP ratings). An alpha level of $p < .05$ was used to denote statistical significance.

Results

Eighteen participants with TBI were initially recruited for this project and completed the RCA. Of this population, two participants' caregivers withdrew their participation from the study and were therefore excluded. Of the remaining 16 participants, two carers were unable to return completed CC-A forms by the required date to be included in the data analysis. Fourteen participants and their caregiver/relative were included in the final data analysis. Informant respondents included four parents, eight spouses/partners, one adult child and one other relative (niece).

Table 2 presents the data used to generate the SALT composites. The data shows an uneven spread of errors with most participants showing a low number of errors across the measures except for participant 2 and 11.

Table 3 displays the data derived from the RCA and CC-A assessments. The data indicated a range of language abilities among the participants, with percentile scores on the CADL-2 ranging from 26 to 99, and CC-A Overall z-scores ranging from -4.0 to 1.3.

The majority of participants were under 12 months post injury at the time of the RCA. The most recent injury was 0.06 years while longest period of time post onset was 4.29 years. The mean years since injury were 0.77 years with a standard deviation of 3.07.

Correlations between these data are presented in Table 4. As would be expected, the CC-A Overall z-scores were statistically significantly correlated with the CC-A subscales. Additionally, the CC-A Overall z-scores and CC-A subscales were also statistically significantly correlated with

the CADL-2. As the CADL-2 provides a single overall score, the relationship between the CC-A Overall z-scores and CADL-2 percentile scores were of most interest.

There was a statistically significant strong positive correlation between the CC-A Overall z-scores and the CADL-2 percentile scores, $r(14) = .70$, $p = .01$ (Figure 1a). There were also statistically significant negative correlations between the CC-A Language Structure z-scores and the SALT Linguistic Composite totals, $r(14) = -.65$, $p = .01$ (Figure 1b), as well as between the CC-A Pragmatic Skills z-scores and SALT Pragmatic Composite totals, $r(14) = -.53$, $p = .05$ (Figure 1c). There were statistical trends for an association between CC-A Social Engagement z-scores and the PKPP ratings ($r(14) = .48$, $p = .08$) and between CC-A Social Engagement z-scores and the SALT Pragmatic Composite totals ($r(14) = -.40$, $p = .15$), but these correlations did not achieve statistical significance.

Figures 1a and 1b indicate that statistically significant associations between the CADL-2 and CC-A Overall z scores (Figure 1a) and the CC-A Language Structure z-scores and the SALT Linguistic Composite totals (Figure 1b) may have been driven by outlying data points. These correlations were recalculated after excluding the participant with a CADL-2 percentile of 26 (Figure 1a) and the two participants with SALT Linguistic Composite totals above 15. While the negative association between the CADL-2 and CC-A Overall z scores remained, the correlation did not meet statistical significance ($r(14) = -0.50$, $p = .08$). Similarly, the negative trend between CC-A Language Structure z-scores and the SALT Linguistic Composite totals did not achieve statistical significance after the two outlying points were excluded ($r(14) = -.29$, $p = .36$).

Table 2. SALT raw score measures

Participant ID #	# of C-units	# of abandoned C-units	Incorrect words produced	Omitted words	Omitted bound Morphemes	Pragmatically Inappropriate	Irrelevant Interpretation
1	65	0	2	1	1	1	3
2	68	6	15	7	0	1	0
3	34	0	4	0	0	0	0
4	51	1	6	2	0	1	0
5	62	4	0	0	0	1	0
6	34	1	2	0	0	0	0
7	53	3	0	1	0	2	0
8	61	1	4	2	0	1	0
9	55	1	2	2	0	0	1
10	48	2	4	1	0	0	0
11	137	5	13	5	2	0	1
12	46	0	3	0	0	0	0
13	75	0	4	1	1	0	0
14	51	2	2	0	0	2	1

Table 3. Language variables of participants in the current study derived from the routine clinical assessment and the CC-A

Participant ID	Monologic discourse analyses				Communication Checklist - Adult			
	CADL-2 percentile	Linguistic Composite	Pragmatic Composite	PKPP ratings	Language Structure z-scores	Pragmatic Skills z scores	Social Engagement z-scores	Overall z-scores
1	81	9	4	78.57%	-2.4	-2.2	-2.4	-4
2	26	22	7	78.57%	-4	-1.9	-4	-4
3	89	4	0	96.43%	-1.6	.4	.2	-2
4	89	8	2	93.33%	-1.5	.4	.4	0
5	99	0	5	100.00%	-1.2	-1.4	-1.6	-1.4
6	89	2	1	78.57%	-1.8	-.4	-1	-1.1
7	98	1	5	89.29%	-.6	-.1	.1	0
8	99	6	2	100.00%	-.6	.3	-.1	.1
9	97	4	2	85.71%	-2.2	.3	-1.3	-1.2
10	98	5	2	100.00%	-.6	.4	.5	.6
11	55	20	6	82.14%	-1.9	-1.5	-1.7	-1.7
12	81	3	0	42.86%	-2	-.8	-1.7	-1.4
13	98	6	0	100.00%	-.8	-.4	-.6	-.6
14	97	2	5	82.14%	.1	.4	.9	1.3

Table 4. Pearson correlation coefficients for the language assessments administered in the current study.

	CC-A LS	CC-A PS	CC-A SE	CC-A O	CADL-2	LC	PC	PKPP
CC-A LS ^a	1	-	-	-	-	-	-	-
CC-A PS ^b	.64*	1	-	-	-	-	-	-
CC-A SE ^c	.88**	.87**	1	-	-	-	-	-
CC-A O ^d	.88**	.89**	.95**	1	-	-	-	-
CADL-2 ^e	.81**	.65*	.76**	.70**	1	-	-	-
LC ^f	-.65*	-.54*	-.61*	-.59*	-.90**	1	-	-
PC ^g	-.23	-.53*	-.40	-.36	-.53*	.51	1	-
PKPP ^h	.48	.40	.48	.44	.45	-.18	-.07	1

Note. ^a CC-A Language Structure subscale z-scores. ^b CC-A Pragmatic Skills z-scores. ^c CC-A Social Engagement z-scores. ^d CC-A Overall z-scores. ^e CADL-2 percentile. ^f Linguistic SALT Composite totals. ^g Pragmatic SALT Composite totals. ^h PKPP % appropriate rated communicative acts. *p < .05. **p < .01.

Figure 1.

Scatter plots and trend lines showing the associations between CC-A Overall z-scores and the CADL-2 percentile scores (Figure 1a), CC-A Language Structure z-scores and the SALT Linguistic Composite totals (Figure 1b) and CC-A Pragmatic Skills z-scores results and SALT Pragmatic Composite totals (Figure 1c).

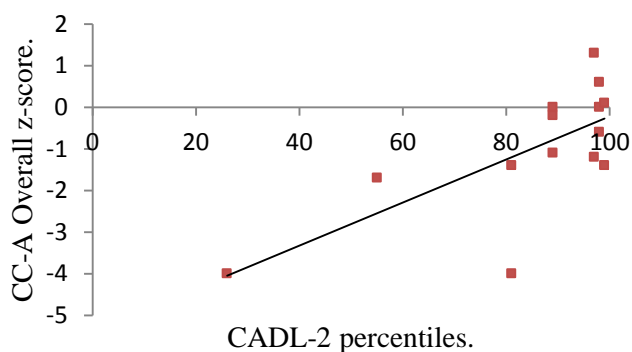


Figure 1a. CC-A Overall z-scores vs. CADL-2 Percentile scores.

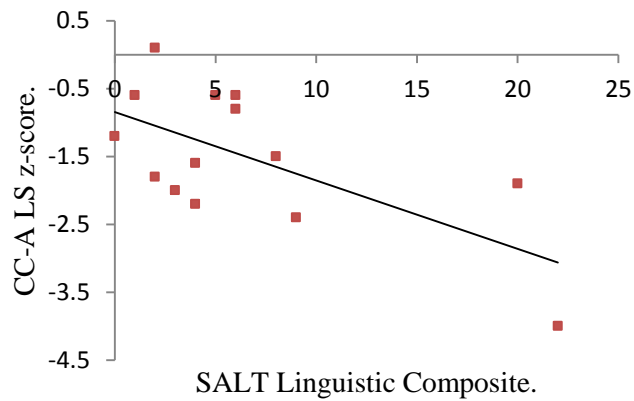


Figure 1b. CC-A Language Structure z-scores vs. to SALT Linguistic Composite totals.

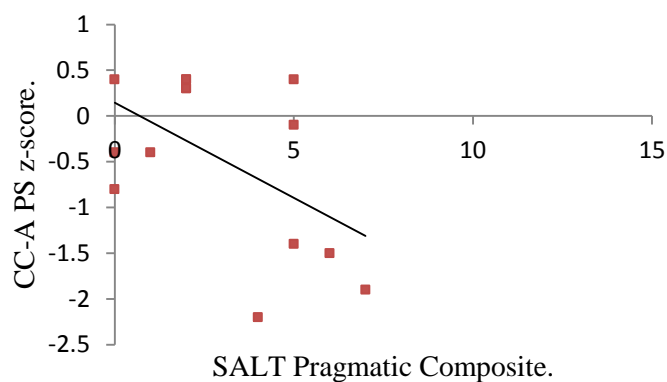


Figure 1c. CC-A Pragmatic Skills z-scores vs. SALT Pragmatic Composite totals.

Discussion

In light of the need for more functional communication assessments that examine communication abilities for individuals post TBI, this study sought to determine the validity of the CC-A by comparing it to an established standardised tool and non-standardised discourse measures. Results of 14 individuals post TBI from a routine clinical assessment were compared with caregiver/relative responses from the CC-A. A strong correlation was found between the CC-A Overall z-scores and the CADL-2 percentile scores. Furthermore, the data highlighted significant correlations between the CC-A Language Structure z-scores and the SALT Linguistic Composite totals and between the CC-A Pragmatic Skills z-scores and SALT Pragmatic Composite totals. However, though a correlation was observed, no statistically significant relationships were found between PKPP ratings and any of CC-A measures.

The strong statistically significant correlation found between the CC-A Overall z-scores and the CADL-2 percentile scores indicate that the CC-A is a useful measure for identifying communication impairment in individuals post TBI. Additionally, these findings reveal that the CC-A shares aspects with the CADL-2 that reflect impairment in individuals with TBI. Analyses that looked at language domains also identified congruence between the CC-A and CADL-2.

The statistically significant correlation between the CC-A Language Structure z-scores and the SALT Linguistic Composite totals suggests that the CC-A is also sensitive to linguistic errors that may be present in an individual's discourse. The statistically significant correlation between the Pragmatic Skills z-scores of the CC-A and results from the SALT Pragmatic Composite totals again suggest that the CC-A is sensitive to impaired pragmatic behaviours that can be observed in individuals post TBI.

Examination of Figures 1a and 1b indicated that the significant associations may be driven by the data points of the individuals with lower functioning. When the analyses were conducted with these outliers removed, the statistical significance of the correlations was lost. However, it is important to note that the same directional trends were still apparent. Outlier removal is usually undertaken to exclude potentially erroneous data (e.g., such as in reaction time experiments, where one person takes considerably longer than other participants). In the current study, the accuracy of the CADL-2 measurement is not in doubt, and the congruence with the CC-A provides further validity. The loss of statistical significance in the current instance is more likely due to the sample being skewed towards less impaired participants and does not invalidate the significant relationships observed. Rather, it provides direction for future research to include a larger spread of impairment within a larger sample of participants.

The data suggested no statistically significant congruence between the CC-A Social Engagement z-scores and either of the RCA pragmatic measures. Still, statistical trends did point to an association between the measures. These comparisons may have suffered from a similar problem to the above with a lack of varying communication impairment severity among participants impacting the results. This could also be said for comparisons between CC-A Social Engagement z-scores and PKPP ratings and between CC-A Social Engagement z-scores and the SALT Pragmatic Composite totals, which showed statistical trends for an association but did not achieve significance.

Another factor that may have affected these correlations is the congruence between items on the CC-A Social Engagement subscale and the RCA tasks. The behaviours assessed in the former subscale have a focus on social-interaction behaviours, such as social inclusion (“is (the participant) left out of joint activities by other people”) and repetitive interests (“talks about his/her friends; shows interests in what they do or say”). These items had no clear equivalent in the CADL-2, Pragmatic Protocol or the SALT Pragmatic Composite, and thus may have influenced the findings.

Limitations

Sample size. A limitation of this study was the relatively small sample size. It is possible to get larger effect sizes as a result of a small sample size compared to studies that include larger populations (Hackshaw, 2008). Therefore, caution should be taken when generalising these findings to the broader community.

Spread of impairment severity. Another limitation relative to the study sample was the spread of the severity in relation to communication impairment TBI participants presented with. The majority of scores for participants with TBI were skewed toward low levels of communication impairment. Inclusion of a participant sample with a broader spread of

severity in communication impairment will build on the findings presented in the current study.

Number of abandoned communication units. Number of abandoned C-units was one of the SALT measurements combined within the SALT pragmatic composite. After listening and coding participant samples, the Student Researcher deemed abandoned C-units to be a pragmatic error. Therefore the measure was included as pragmatic ability. However, it could be argued that in some instances this type of error may have been due to linguistic processing error while other instances may have been pragmatic in nature. Therefore, abandoned C-units could also have been considered for inclusion within the SALT Linguistic Composite.

Communication Activities of Daily Living - Second Edition. The CADL-2, while noted to have strong reliability and validity, does not contain subscales that reflect areas of impairment/strength. This makes defining exact areas of strength and difficulty when examining results from this assessment challenging. For example, the CC-A Overall z-scores and CADL-2 percentile scores showed a strong correlation. Due to the CADL-2 subscales not including subscales relating to particular areas of skill or impairment, it is difficult to draw conclusions as to which areas tested under the CADL-2 actually correlate to specific subscales of the CC-A.

Broader implications.

This study provides preliminary evidence that the CC-A is a valid measure of communication abilities in individuals with TBI. Given its strong relationship in predicting overall impairment, this study shows that the CC-A has the potential to be a clinical tool for Speech Pathologists when assessing people with TBI. Information from the CC-A would allow clinicians to gain an insight into areas that may not be available through the use of traditional face-to-face in clinic assessment. This would be achieved through the utilisation

of caregivers/relatives of the individuals post TBI who have extensive exposure to their day to day communication interactions.

Furthermore, the CC-A could provide clinicians with an accurate and time efficient complement to standard clinical assessment. Utilising the CC-A in this context could provide a more holistic assessment given a caregiver/relative is exposed to participants a great deal more than is feasible for a clinician. Also, caregivers and respondents have the opportunity to see the individual in a number of different contexts that a clinician may not have occasion to see (Douglas, O'Flaherty & Snow, 2000).

Information derived from the CC-A could potentially also be used to further assist in planning client centred goals and therapy so that intervention can be more meaningful and more relevant for the client. Additionally, it is well known that families play a crucial part in achieving long term functional goals for people with TBI and it is important that they are included when developing goals and planning therapy (Boschen, Gargaro, Gan, Gerber & Brandys, 2007; Sander, Caroselli, High Jr, Becker & Scheibel, 2002). The CC-A has the capacity to be utilised by clinicians to allow caregivers and relatives greater involvement in an individual's speech pathology intervention.

Areas of future research

Future research should be directed at replicating these results with a larger sample population with a larger spread of severity to build on the findings of the current study. Additionally, further benefit could be gained from validation against other established clinical tests such as batteries and self-report measures. Lastly, Indigenous Australians and English as Second Language (ESL) participants are not well represented in this study. This was largely due to the limited availability of such participants and a lack of contingencies available for individuals who had difficulty participating in the RCA and CC-A in English. As these populations make up a large part of the clinical reality for clinicians in Australia and

other countries, future research could be directed toward assessing the reliability and validity of the CC-A with such populations.

Conclusion

In conclusion, this study achieved the stated study aim of determining the validity of the CC-A through comparison to an established standardised tool and non-standardised measures. The findings suggest that the CC-A may be an appropriate clinical tool for use when assessing individuals from the TBI population. Additionally, the study findings suggest that the questions on the CC-A may allow untrained caregivers/relatives, outside of the clinical context, to provide information that is accurate and relevant to measures of clinical communication impairment. However, due to the small sample size and lack of variety in communication severity in the sample population, these are preliminary conclusions and generalisation should be considered with caution. Nevertheless, future studies can build on the findings presented in this study by assessing a larger number of patients presenting with more diverse levels of communication impairment.

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Appendix A: Communication Checklist - Adult Response form

The Communication Checklist – Adult (CC-A)

A. J. O. Whitehouse and D.V.M. Bishop



INSTRUCTIONS

The CC-A was developed to help us understand more about communication strengths and difficulties. Although we can get an idea of how someone communicates by using language tests, it is helpful to also find out how they behave in an everyday setting, by obtaining information from someone who knows them well – a partner, parent, close friend, or carer. You can help us do this by completing the items on the next three pages.

This checklist contains a series of statements describing how people communicate. For each statement, you are asked to give information about the person whose name (or code number) appears below. You are asked to judge whether you have observed that behaviour:

0	less than once a week (or never)
1	at least once a week, but not every day
2	once or twice a day
3	several times a day (or always)

Please write the number in the box for each item, choosing the response that, in your judgement, best describes the person. If you find it hard to make up your mind, think over the last week, and try to remember how often you have observed them behaving this way.

Please read each item carefully. Do not leave any items blank. If you are really unable to make a judgement, please put an X against that item, and add a comment if you wish.

Person whom Checklist is about

Name: _____ Gender: _____

Date of birth: _____ Today's date: _____ Age: _____

Has s/he ever had a permanent hearing loss diagnosed? YES NO
If YES, please give further details below.

Has s/he any permanent physical handicap or chronic illness? YES NO
If YES, please give further details below.

Is English the main language spoken at home? YES NO
If NO, please give further details below.

Additional details:

Person completing the Checklist

Name: _____ Gender: _____

Age in years: _____ Your relation to the person (e.g. partner, parent): _____

How long have you known this person? _____

The Communication Checklist – Adult (CC-A)

Please enter a number in the box in the right hand column, as follows:
 0 = less than once a week (or never); 1 = at least once a week, but not every day
 2 = once or twice a day; 3 = several times a day (or always)

1.	Gets mixed up between 'he', 'she', 'it' and 'they'. So when describing a friend, s/he might say, 'John works at a record shop. They go to work on the bus.'	
2.	Simplifies words by leaving out some sounds; e.g. 'crocodile' is pronounced as 'cockodile', or 'stranger' as 'staynger'.	
3.	Appears anxious in the company of other people.	
4.	Makes false starts, and appears to search for the right words; e.g. might say 'do you- do you- do you want to go- want to go to the cinema?'	
5.	S/he interrupts people at inappropriate times.	
6.	Forgets words s/he knows; e.g. instead of 'rhinoceros' may say 'you know, the animal with the horn on its nose...'	
7.	In social situations, s/he seems inattentive, distant or preoccupied.	
8.	Looks blank in a situation where most people would show a clear facial expression; e.g. when angry, fearful or happy.	
9.	When s/he has free time, chooses the same favourite activity; e.g. putting together a jigsaw puzzle or searching for the same thing on the internet.	
10.	Uses terms like 'he' or 'it' without making it clear what s/he is talking about; e.g. when talking about a film, s/he might say 'he was really great' without explaining who 'he' is.	
11.	Says things that may appear too formal for a given situation. So, for instance, after eating a nice meal, s/he may be heard to say, 'that meal was a culinary delight'.	
12.	Mixes up words of similar meaning; e.g. might say 'screwdriver' for 'hammer'.	
13.	Others have fun at his/her expense.	
14.	Tends not to look people in the eye during conversations.	
15.	Misses the point of jokes and puns (though may be amused by nonverbal humour such as slapstick).	
16.	Is left out of joint activities by other people.	
17.	Gets mixed up between he/him or she/her; so might say 'him is working' rather than 'he is working', or 'her have a cake' rather than 'she has a cake'.	
18.	Uses favourite phrases, sentences or longer sequences in rather inappropriate contexts; e.g. might say 'all of a sudden' rather than 'then', as in 'we went to the park and all of a sudden we had a picnic'; or might habitually start utterances with 'by the way'.	
19.	Gets confused when a word is used with a different meaning from usual; e.g. might fail to understand if an unfriendly person was described as 'cold' (and would assume they were shivering!).	
20.	Stands too close to other people when talking to them.	
21.	Talks to people too readily; e.g. without any encouragement, might start up a conversation with a stranger on a train who is reading a book.	
22.	Talks about lists of things s/he has memorised; e.g. the names of the capitals of the world or the performance of a sporting team.	
23.	Pronounces words in an over-precise manner; accent may sound affected or 'put-on' as if mimicking a TV personality rather than talking like those around him/her.	
24.	Pronounces words in an immature way, such as 'chimbley' for 'chimney'.	
25.	Talks about fictitious events (e.g. people/events in soap-operas, films) as if they were real.	
26.	Moves the conversation to a favourite topic, even if others don't seem interested in it.	
27.	Leaves important words out of a sentence, such as 'I went to cinema', instead of 'I went to the cinema' or 'I spoke to my friend, phone' instead of 'I spoke to my friend on the phone'.	

The Communication Checklist – Adult (CC-A)

Please enter a number in the box in the right hand column, as follows:
 0 = less than once a week (or never); 1 = at least once a week, but not every day
 2 = once or twice a day; 3 = several times a day (or always)

28.	Ability to communicate varies from situation to situation; e.g. may cope well when talking one-to-one with a familiar person, but have difficulty expressing him/herself in a group.	
29.	Leaves off beginnings or ends of words; e.g. says 'roe' instead of 'road' or 'puter' instead of 'computer'.	
30.	Repeats back what others have just said. For instance, if you ask, 'what did you eat?', s/he might say, 'what did I eat?'	
31.	Ignores conversational overtures from others; e.g. if asked, 'what are you doing?', does not look up and just continues working.	
32.	Mixes up words that sound similar; e.g. might say 'telephone' for 'television' or 'magician' for 'musician'.	
33.	Hurts or upsets other people without meaning to; e.g. s/he may say 'blunt' things that offend people.	
34.	Takes in just 1-2 words in a sentence, and so misinterprets what has been said; e.g. if someone says 'I want to go skating next week', s/he may think they've been skating, or want to go now.	
35.	It's difficult to stop him/her from talking.	
36.	Leaves off past tense -ed endings on words; e.g. might say 'John kick the ball' instead of 'John kicked the ball', or 'Sally play over there' instead of 'Sally played over there'.	
37.	Tends to bore people. For instance, s/he may talk about facts that appear obvious, or talk about an event or a joke for too long.	
38.	Makes mistakes in pronouncing long words; e.g. says 'vegebable' rather than 'vegetable' or 'trellistope' rather than 'telescope'.	
39.	Fails to recognise when other people are upset or angry.	
40.	Gets the sequence of events muddled up when trying to tell a story or describe a recent event; e.g. if describing a film, might talk about the end before the beginning.	
41.	Is over-literal, sometimes with (unintentionally) humorous results; e.g. a person who was asked 'Do you find it hard to get up in the morning?' replied 'No, you just put one leg out of the bed and then the other and stand up.' Another person who was warned 'Watch your hands' when using a sharp knife, proceeded to stare at his fingers.	
42.	Includes over-precise information (e.g. exact date or time) in his/her talk; e.g. when asked 'when did you go on holiday?' may say '13th July 1995' rather than 'in the summer'.	
43.	Leaves out 'is'; e.g. says 'Dan going to work' rather than 'Dan's going to work' or might say 'That girl short' rather than 'That girl is short'.	
44.	Mispronounces 'th' for 's' or 'w' for 'r'; e.g. says 'thoap' instead of 'soap' or 'weally' instead of 'really'.	
45.	Asks a question, even though s/he has been given the answer.	
46.	Is vague in choice of words, making it unclear what s/he is talking about; e.g. saying 'that thing' rather than 'kettle'.	
47.	Shows unusual interest in things or activities that most people would find unremarkable, such as types of electric socket, washing machines, types of apples.	
48.	Doesn't explain what s/he is talking about to someone who doesn't share his/her experiences. For instance, might talk about 'Daniel' without explaining who he is.	
49.	Uses unusual words even when chatting informally. Talks like an academic professor in inappropriate social settings.	
50.	It is hard to make sense of what s/he is saying (even though the words are spoken clearly).	

The Communication Checklist – Adult (CC-A)

The questions so far have asked about difficulties people may have that affect communication. The remaining questions ask about communicative strengths. Please respond 0 to 3, as before, but remember that now a 0 response would mean that a person lacks this strength, and a 3 would indicate good communicative skill.

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51.	Speaks clearly so that the words can easily be understood by someone who doesn't know him/her very well.	
52.	Reacts positively when a new and unfamiliar activity is suggested.	
53.	Talks clearly about what s/he plans to do in the future; e.g. what s/he will do tomorrow, or plans for going on holiday.	
54.	Appreciates the humour expressed by irony; e.g. would be amused rather than confused if someone said 'Isn't it a lovely day!' when it is pouring with rain.	
55.	Produces long and complicated sentences such as: 'When we went to the football match, I saw England win' or 'I saw this man standing on the corner'.	
56.	Makes good use of gestures to get his/her meaning across.	
57.	Shows concern when other people are upset.	
58.	Speaks fluently and clearly, producing all speech sounds accurately and without any hesitation.	
59.	Keeps quiet in situations where someone else is trying to talk or concentrate; e.g. when someone else is watching TV, or during formal occasions such as a wedding or lecture.	
60.	Realises the need to be polite; e.g. would pretend to be pleased if given a present s/he did not really like, and would avoid making personal comments about strangers.	
61.	When answering a question, provides enough information without being over-precise.	
62.	You can have an enjoyable, interesting conversation with him/her.	
63.	Shows flexibility in adapting to unexpected situations; e.g. does not get upset if s/he planned to work on a computer, but has to do something else because it isn't working.	
64.	Uses abstract words that refer to general concepts rather than something you can see; e.g. 'knowledge', 'politics', 'courage'.	
65.	Smiles appropriately when talking to people.	
66.	Uses words that refer to whole classes of objects, rather than a specific item; e.g. refers to a table, chair and drawers as 'furniture', or to apples, bananas and pears as 'fruit'.	
67.	Talks about his/her friends; shows interest in what they do and say.	
68.	Explains a past event clearly; e.g. what s/he did at work, or what happened at a football game.	
69.	Produces sentences containing 'because' such as 'John had a cake because it was his birthday'.	
70.	Talks to others about their interests, rather than his/her own.	



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