Interaction between familiar and unfamiliar communication partners with individuals with traumatic brain injury

By

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A dissertation submitted in fulfilment of the requirements for the degree

MA Speech-Language Pathology

In the Department of Speech-Language Pathology and Audiology,

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Declaration of originality

The Department of Speech-Language Pathology and Audiology places great emphasis upon integrity and ethical conduct in the preparation of all written work submitted for academic evaluation.

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Abstract

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Initials and surname	S van der Bergh
Supervisors	Mrs B Pillay Dr E Krüger
Date	October 2019
Title	**Interaction between familiar and unfamiliar communication partners with individuals with traumatic brain injury**

Purpose: Deficits in communication may predominantly impact communication participation after traumatic brain injury, although links between specific communication deficits and the type of communication partner have not yet been determined. This study describes differences in the communication interaction of individuals with traumatic brain injury with familiar and unfamiliar communication partners.

Method: Eight participants with mild to moderate traumatic brain injury participated in fifteen-minute structured conversations with eight familiar communication partners and eight unfamiliar communication partners. All communication interactions were rated by a speech-language therapist using the Adapted Kagan scales.

Results: Non-parametric between-group comparisons did not reveal statistically significant differences between interactions of individuals with traumatic brain injury during familiar and unfamiliar communication partner conditions across all subtests on the Adapted Measure of Participation in Conversation. However, when comparing familiar and unfamiliar communication partner performance, significant differences were found on a range of subtests across the Adapted Measure of Support in Conversation.

Conclusion: Poor communication-participation, as evidenced by the Adapted Measure of Participation in Conversation scales, may occur as a result of underlying cognitive-linguistic deficits as a known consequence of traumatic brain injury. Participants with traumatic brain injury may have the potential to participate in interactions if provided with appropriate support. The Adapted Kagan scales may be valuable to speech-language therapists and may guide communication partner training for individuals with mild to moderate traumatic brain injury.

Keywords: Traumatic brain injury, cognitive-communication disorders, conversation, Adapted Kagan scales, communication partners

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Remember the mountains and valleys that got you here. They are not accidents, and those moments weren't in vain. You are not the same. You have grown and you are growing. You are breathing, you are living, you are wrapped in endless, boundless grace. And things will get better. There is more to you than yesterday.

- ***Morgan Harper Nichols***

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Abbreviations

TBI	Traumatic brain injury
CP	Communication partner
CCD	Cognitive-communication disorder
ECP	Everyday communication partner
FCP	Familiar communication partner
UFCP	Unfamiliar communication partner
CPT	Communication partner training
QoL	Quality of life
SLT	Speech-Language Therapist
MPC	Adapted Measure of Participation in Conversation
MSC	Adapted Measure of Skill in Supported Conversation
WHO	World Health Organisation
ICF	International Classification of Functioning, Disability and Health
mTBI	Mild traumatic brain injury
ASHA	American Speech, Language and Hearing Association
MVA	Motor vehicle accident
GSW	Gunshot wound
HPCSA	Health Professions Council of South Africa
LMICs	Low and middle-income countries
MDT	Multidisciplinary team

Tables and figures

Chapter 1: Introduction

This chapter aims to provide an overview of the relevant literature regarding the degree of communication-interaction of individuals with traumatic brain injury during interactions with varying communication partners. It also provides the support types offered by these communication partners during interactions. This chapter concludes with the rationale and research question. Terminology commonly used throughout the dissertation, and an outline of the chapters contained in the dissertation is also included.

1.1. Introduction

Traumatic brain injury (TBI) is the world's leading cause of mortality and morbidity (Roozenbeek, Maas & Menon, 2013; World Health Organization [WHO], 2006) affecting approximately ten million people worldwide (Hyder, Wunderlich, Puvanachandra, Gururaj & Kobusingye, 2007) and, is especially prominent in low and middle-income countries [LMICs], such as South Africa (De Silva et al.,2008; Hyder et al., 2007; Naidoo, 2013; Schrieff, Thomas, Dollman, Rohlwink & Figaji, 2013). The incidence of TBI continues to grow and is generally associated with severe disability with limited treatment options making TBI a critical public health and socio-economic problem (Cox et al., 2017; Roozenbeek et al., 2013). As a range of aspects of health are affected, the common consequences of TBI are well-documented throughout literature (Douglas, Knox, De Maio & Bridge, 2015; Larkins, 2007) with disabilities spanning physical, emotional, behavioural, and cognitive domains of function (Lê, Mozeiko & Coelho, 2011; McDonald, Togher & Code, 2014; Togher et al., 2014). While TBI is a complex disorder, common patterns in brain pathology, and related cognitive and social communication impairments exist due to the intricate interaction between cognition and language skills (Chia et al., 2019; Togher et al., 2014). Diffuse brain damage can lead to various cognitive deficits in executive function, memory, and attention; thus there is much diversification in and across the conversational abilities of individuals with TBI (Manktelow, Menon, Sahakian & Stamatakis, 2017).

Effective communication-interaction skills are deemed to be cognitively demanding as these skills are based on the integrity of a variety of cognitive and psychosocial abilities (McDonald et

al., 2014). For communication to be deemed successful, individuals are required to plan and use language flexibly within a variety of contexts, while suppressing inappropriate responses, and continually updating representations in working memory as social cues change over time (MacDonald, 2017). There is a consensus in literature that social and cognitive-communication impairments are common sequelae of TBI (Byom & Turkstra, 2017; Marini et al., 2014; McDonald et al., 2014; Shorland & Douglas, 2010; Steel & Togher, 2019). Communication deficits post TBI is characterised by the American Speech-Language-Hearing Association (ASHA) as 'cognitive-communication disorders' [CCD] (Chia et al., 2019). A CCD reduces an individual's ability to participate in pre-morbid interests and daily activities at the same functional level before their injury while additionally impacting individuals' ability to interact with everyday communication partners [ECPs] (Salas, Casassus, Rowlands, Pimm & Flanagan, 2016). Limitations in individuals with TBIs' ability to actively participate in pre-morbid activities could in turn disrupt family interactions (Knox, Douglas & Bigby, 2015; MacDonald, 2017; Togher, Power, Rietdijk, McDdonald & Tate, 2012), academic performance (Turkstra, Politis & Forsyth, 2015), vocational success (Douglas, Bracy & Snow, 2016; Meulenbroek & Turkstra, 2016), social participation (Finch, Copley, Cornwell & Kelly, 2016; Struchen et al., 2011), and broadly impact an individual's quality of life [QoL] (Chia et al., 2019). It is an essential role of Speech-Language Therapists [SLTs] to assist individuals with TBI to develop the necessary communication skills and provide them with strategies to maximise their level of social participation and activity; thereby fostering productivity and increased life satisfaction (ASHA, 2016; ASHA, 2019; Chia et al., 2019). These impairments, consequences, and related participation restrictions have collectively spurred more focused research effort towards understanding how to facilitate the remediation of social difficulties and CCDs following TBI.

Social communication impairments result from the breakdown in the interactional use of language (i.e. both verbal and non-verbal aspects) and cognitive functions; thus, difficulties with appropriate participation in communication situations are a common consequence of TBI (Rietdijk, Power, Brunner & Togher, 2018). Most individuals with TBI have intact language but tend to have poor communication skills (Bosco et al., 2015). Defining characteristics of

communication difficulties in TBI are, therefore, associated with language use rather than a lack of language skills; further referring to an inability to apply and adapt language effectively in order to meet the demands of everyday conversations (Larkins, 2007; Marini et al., 2014; McDonald et al., 2014). The dissociation between intact language and disrupted interpersonal communication in individuals with TBI has driven researchers to investigate the reasons underlying the inability to produce successful communicative exchanges (Rigon, Voss, Turkstra, Mutlu & Duff, 2016).

Post-TBI communication impairments typically include excessive talkativeness (Behn, Togher, Power & Heard, 2012; Sim, Power & Togher, 2013), tangential speech, difficulty in initiating and sustaining a conversation, and inappropriate disinhibited responses (Togher et al., 2014). Changes in pragmatic abilities is another hallmark characteristic of TBI, with ensuing impairments in all aspects of social competency (Byom & Turkstra, 2017; Rousseaux et al., 2010; Togher et al., 2014). In adults with TBI, social communication deficits may include impaired comprehension of indirect language such as difficulties with the interpretation of ambiguous language, comprehending sarcasm, humour, and irony (Angeleri et al., 2008; Bosco & Angeleri, 2012; Bosco et al., 2015), poor organisation of spoken and written discourse (Rousseaux et al., 2010), giving too much or too little information to their communication partners [CPs] (Coelho et al. 2002; Moran et al. 2012), failing to adjust their language in response to the partner, and an overall inability to cope with the numerous demands of conversations or tasks (Byom & Turkstra, 2012; Rousseaux et al., 2010; Togher et al., 2014). Behavioural deficiencies may be associated with individuals who present with an impoverished style of communication characterised by slow rates, and reduced or incomplete content, numerous pauses, and a reliance on set expressions (Rousseaux et al., 2010; Sim et al., 2013; Togher et al., 2014). People with TBI may also demonstrate confused, inaccurate, and confabulatory verbal b11ehaviour, or various combinations of these features (Togher et al., 2014). Therefore, individuals with TBI may also have difficulty with adhering to social norms and rules and may display insensitivity and blunt mannerisms during social interactions (Sim et al., 2013).

Communicative competence (e.g. listening, speaking, reading, writing, conversation, and social interaction) are specifically affected post-TBI due to the commonly experienced cognitive impairments (e.g. attention, memory, organisation, information processing, problem solving, and executive functions), which are involved in many aspects of social processing and interpersonal communication (Kilov, Togher & Grant, 2009; Togher et al., 2014). CCD further refers to overlapping collections of communication deficits that are associated with neurological impairment. As a result of CCDs, conversations with individuals with TBI have been described as less compelling, less appropriate, less rewarding, and more effortful than conversations involving people without brain injury (Behn et al., 2012; Sim et al., 2013).

Angeleri et al. (2008) concluded that compared to normal controls, individuals with TBI presented with a communicative deficit, but also have preserved abilities in some areas. The authors' findings suggest that despite communication deficits, particular pragmatic abilities are less impaired than others, and the reported impairments tend to be in higher-level aspects of social interaction and conversation (Angeleri et al., 2008; Bosco & Angeleri, 2012; Bosco et al., 2015; Bosco, Parola, Sacco, Zettin & Angeleri, 2017). Although having difficulties with topic change and topic maintenance, individuals with TBI were able to preserve structure to their communication in short conversations with simple topics, for example, when discussing favourite leisure activities and topics of interest (Angeleri et al., 2008; Bosco & Angeleri, 2012). In an attempt to investigate the communicative ability of people with TBI in terms of comprehension and production at a conversational level, Dardier et al. (2011) conducted a study using an interview approach (Dardier et al., 2011). Dardier et al. (2011) reported differences across pragmatic tasks; however, the authors also reported preserved abilities in the comprehension of requests and conversational hints as well as in turn-taking abilities.

Furthermore, the results obtained by Togher, Hand and Code (1996, 1997), although somewhat dated, also showed that given the opportunity during specific real-life speaking situations (e.g. speaking to their therapist, to the police, to the bus timetable information service), individuals with TBI could serve as effective information-givers. Moreover, the performance of participants

with TBI was similar to those of matched controls involved in the same communicative situations (Togher, et al., n.d., 1996, 1997).

Based on these common communication characteristics, communication-interaction with individuals with TBI often requires CPs to maintain the burden of repairing, organising and providing structure to social interactions (Behn et al., 2012; Lê et al., 2011; Togher et al., 1997). Studies examining the discourse of individuals with TBI showed that CPs play a vital role in effective conversations (Chia et al., 2019; Togher et al., 1997; Togher, McDonald, Tate, Power & Rietdijk, 2013; Togher, Power, Tate, McDonald & Rietdijk, 2010; Tu, Togher & Power, 2011). Given conversations are dynamic, with both participants contributing to the success of an interaction, it is essential also to consider the potential of CPs to positively or negatively influence interactions (Bogart, Togher, Power & Docking, 2012; Kilov et al., 2009; Togher, McDonald, Tate, Power & Rietdijk, 2009). Comparison of various CPs and their interaction with individuals with TBI can, therefore, generate a comprehensive understanding of the overall effect that CCDs may exert on individuals with TBI's degree of participation during interactions.

Communication difficulties experienced by people with TBI can also be exacerbated by their CPs' inadequate responses (Togher et al., 2009). Thus, CPs can be regarded as a barrier in the interactions with individuals with TBI as they may use disempowering strategies during interactions with individuals with TBI. For example, they may overcompensate by speaking too slowly/quickly, not provide individuals with TBI with communication opportunities, talk for/on behalf of the person or ask testing questions, thereby ultimately compensating for the person with TBI's perceived deficits (Togher & Hand, 1999; Togher et al., 1997; Togher et al., 2009). Togher et al. (1997) confirmed that CPs of people with TBI displayed maladaptive behaviours, including frequent questioning, requests for clarification and slowed speech production. Such behaviours may disempower the person with TBI to contribute to conversations (Togher et al., 1997).

On the other hand, CPs can also positively influence the interactions of individuals with TBI and may act as facilitators. For example, alternative CPs such as friends may provide a facilitative environment (Bogart et al., 2012; Kilov et al., 2009). In a study by Bogart et al. (2012), the facilitatory effect of familiar CPs (i.e. friends) on discourse abilities of people with TBI were investigated in jointly-produced narratives and conversations. The authors found that participants with TBI were able to contribute similar amounts of information as non-injured participants from the control group when supported by familiar communication partners [FCPs] (Bogart et al., 2012; Sim et al., 2013). Moreover, when participants with TBI spoke in familiar contexts to discuss personally relevant topics, they produced significantly more coherent and cohesive discourse (Togher & Hand, 1999). Other studies of a similar nature showed that people with TBI provided more detailed information with CPs who used support strategies such as asking elaborative questions and responding to requests for clarification (Chia et al., 2019; Togher, Taylor, Aird & Grant, 2006). These studies, however, tend to focus on analysing the discourse of the person with TBI, but not the strategies employed by their CPs.

Alternatively, the ability of individuals with TBI to contribute information in interactions with other CPs, termed as unfamiliar communication partners [UFCPs], may contrast as they could exert adverse effects, i.e. lack of shared meaning in personal narratives, on the interactions of people with TBI (Togher et al., 2006). Results from these studies are not generalizable as only a handful of studies in TBI literature have examined purposeful, real-life interactions with familiar CPs who may have meaningful relationships with the individuals themselves (Behn et al., 2012; Sim et al., 2013; Tu et al., 2011). Due to the paucity of information of FCPs interaction with individuals with TBI included in clinical studies, it is difficult to identify if discourse performance of individuals with TBI may be improved in the presence of people who share meaningful social relationships with persons with TBI (Kilov et al., 2009), which warrants further investigation. Overall, these findings demonstrate that CP contributions can limit or facilitate conversational effectiveness regardless of the familiarity of the CP.

With an understanding that CPs have an impact on the participation of individuals with TBI, few studies have shown that with training, CPs can negotiate communication breakdowns and optimise the conversational skills of individuals with TBI (Chia et al., 2019; Togher et al., 2004, 2013). Thus, if trained, CPs may enhance the communicative competence of people with TBI (Togher, McDonald, Code & Grant, 2004). Training of CPs is more common in treatment of aphasia (Simmons-Mackie, Raymer & Cherney, 2010; Turner & Whitworth, 2006) and there are only a few studies in TBI supporting this same approach to intervention (Togher, 2013; Togher et al., 2013; Togher et al., 2011; Togher et al., 2012; Tu et al., 2011).

Considering the context of interactions is also central to understanding communication behaviours. A small number of studies have examined the effects of the context on the communication potential of people with TBI (Kilov et al., 2009; Togher et al., 1997; Togher et al., 2006). Current TBI practice guidelines are only just beginning to realise the relevance of contextualised intervention and the importance of inclusion of communication partner training [CPT] to meet the everyday communication demands of the individual with TBI (Tu et al., 2011). Contextualised interventions involve CPs, and promote self-supportive strategies, with a focus on enabling the person's return to work, return to school, and maximising social participation (Cicerone et al., 2011; MacDonald & Wiseman-Hakes, 2010). Therefore, different contexts and CPs may change how individuals with TBI participate in conversations (Sim et al., 2013).

TBI has a profound impact on both the life of the affected individual and their families, however, the comprehensive description of the functional status of an individual with TBI remains a challenge (Ptyushkin, Vidmar, Burger & Marincek, 2012). No standardised measures of assessment and intervention for people with TBI currently exist, and none consider all aspects of functioning. There is a need for current rehabilitation programmes that are designed for persons with TBI to include and consider measures that respond to an individual's contextual factors and the need for the development of instruments that can quantify these factors. The International Classification of Functioning, Disability, and Health [ICF] can be considered of great value within this context as it is a potentially useful tool to adequately

classify, assess, and describe functioning and disability related to TBI. Ptyushkin et al. (2012) reviewed research describing the implementation of the ICF with individuals with TBI. The authors concluded that the ICF could be useful in the rehabilitation of individuals with TBI, at least as a conceptual model. Despite critical points raised in other studies, the literature suggests that the ICF is useful both as a model of health and disability and classification (Ptyushkin et al., 2012). The ICF can be used as the basis for practical instruments to be used in rehabilitation and for the description and assessment of functioning for persons with TBI (Laxe, Cieza & Castaño-Monsalve, 2015; Ptyushkin et al., 2012). The ICF, therefore, allows for the systematic descriptions of not only body functions and structures but also the activities and participation and the influence of the contextual factors relevant for rehabilitation. At the same time, the ICF allows SLTs to adopt a comprehensive and holistic approach to the intervention of individuals with TBI. Larkins (2007) further discusses the value of applying the ICF for the intervention of communication and cognitive disorders post-TBI; also suggesting that the ICF supports a systematic approach for understanding CCD in individuals with TBI.

It is evident that the characterisation of communication difficulties experienced by people with TBI is a growing topic of interest amongst available TBI literature; with increased research being generated regarding where, how, and why these CCD manifest (MacDonald, 2017; McDonald et al., 2014). Recent approaches view communication from the perspective of cognition, social processing, and available social contexts, referring to CPs and social opportunities (MacDonald, 2017). With this definition of communication being broadened, it allows for holistic management as the ICF is incorporated into the management of individuals with TBI. Further insight into the development of comprehensive assessment and rehabilitation approaches, which are sensitive to commonly experienced barriers and facilitators evident in people within TBIs' day-to-day lives, are also possible. However, comparison of interactions with individuals with TBI and varying CPs in everyday life scenarios has not yet been extensively described. Due to this dearth in the literature, the communication ability of people with TBI in everyday life with ECPs is still relatively unknown (Tu et al., 2011). It is essential that communication following TBI is approached as a two-way process, and therefore emphasises the need to

consider CPs' influence on the interactions, and consequently the participation, of persons with TBI.

1.2. Problem statement

Communication impairments persist long after the acute phase of the injury, with one study documenting impairments in discourse performance up to 35 years post-injury (Mozeiko, Le, Coelho, Krueger & Grafman, 2011). To date, the majority of the behavioural research in the field of TBI has been neuro-psychologically based (Barwood & Murdoch, 2013; Duff, Proctor & Haley, 2002; McDonald et al., 2014; Togher et al., 2014; Whelan, Murdoch & Bellamy, 2007; Wong, Murdoch & Whelan, 2010), with the impact of the everyday life consequences of CCD post-TBI remaining largely unknown (Togher et al., 2014). Recent approaches implementing the ICF as a conceptual model note that different contexts and different CPs may largely influence how individuals with TBI participate in conversations; constituting this circumstance as a growing topic of interest (Mann, Power, Barnes, & Togher, 2015; Sim et al., 2013). There is a general consensus in realising the value of two avenues of intervention, which have shown promise: (*i*) training individuals with TBI with the skills necessary for successful social interaction and; (*ii*) training the CPs of individuals with TBI to use strategies for promoting more successful communication-interactions (Togher et al., 2013).

Only a handful of approaches discuss and are based on the idea of strengthening the potential of communication between the individual with TBI and their CP (Carbonneau, Dorze, Joyal & Plouffe, 2013). With the help of the ICF, it is now generally accepted that careful consideration of contextual factors (i.e. referring to an individuals' physical and social environment such as opportunities for interaction with varying CPs) is essential for successful rehabilitation (Ptyushkin et al., 2012). More so, available TBI literature recognises the importance of including CPs in the process of rehabilitation for individuals with TBI (Behn et al., 2012; Bogart et al., 2012; Carbonneau et al., 2013; MacDonald, 2017; Sim et al., 2013; Togher et al., 2004; Togher et al., 2013). There is also evidence describing the positive influence that CPs exert on the

communication-interactions of individuals with TBI (Bogart et al., 2012) as well as the impact of varying CPs on the interactions of people with TBI (Tu et al., 2011).

There appears to be value in investigating variations in the conversational discourse between, for example, a FCP and an UFCP's interaction with the same individual with TBI. To the researcher's knowledge, there are no known studies which set out to investigate this aspect specifically, and subsequently, the following research question was posed: *How do the communication-interactions of individuals with mild to moderate TBI with FCPs compare to those communication-interactions with UFCPs*? If differences in communication-interaction can be found between the varying CPs, the results from this study may set apart the subtle and functional communication difficulties commonly experienced between individuals with TBI and their CPs and the degree of support types offered by CPs. Establishing a therapeutic framework that identifies and fosters the skills and support types utilised by varying CPs and individuals with TBI during interactions, may be of importance in enhancing rehabilitation effectiveness and individual outcomes (Sim et al., 2013).

Improved understanding regarding the interaction of FCPs and UFCPs with individuals with TBI is vital as communication, and social disorders post-TBI, are core drawbacks to successful intervention (McDonald et al., 2014). SLTs have specialist knowledge and skills to address communication impairments (ASHA, 2016; Togher et al., 2014), and therefore have a unique role in the assessment and management of cognitive and communication functioning in individuals with TBI (ASHA, 2016; Finch et al., 2016; Togher et al., 2014). This study aimed to compare the communication interactions of individuals with TBI and FCPs, to the communication interactions with UFCPs. Therefore, this research identifies and describes how CP familiarity may change communication participation for individuals with TBI while providing insight into the type and degree of support offered by varying CPs. The findings may offer valuable insight for SLTs and highlight considerations for the use of standardised and functional measures of communication assessment and remediation for people with CCD and TBI. The findings may pose important questions about the role of CP familiarity for successful communication participation for individuals with TBI and overcoming the effects of CCD. The

data may support further development of training and rating procedures for the Adapted Kagan scales (Togher et al., 2010) and promote more frequent and reliable use of these communication measures, specifically within the unique and diverse South African context.

1.3. The terminology used in the dissertation

Cognitive-communication disorder

ASHA (2005) defined CCDs as those that, "...encompass difficulty with any aspect of communication that is affected by the disruption of cognition". Communication may be verbal or nonverbal and includes listening, speaking, gesturing, reading, and writing in all domains of language (phonologic, morphologic, syntactic, semantic, and pragmatic). Cognition includes cognitive processes and systems (e.g., attention, perception, memory, organisation, executive function). Areas of function affected by cognitive impairments include behavioural self-regulation, social interaction, activities of daily living, learning and academic performance, and vocational performance. Cognitive-communication disorders may be congenital or acquired. Acquired aetiologies include but are not limited to stroke, brain tumour, TBI, anoxic or toxic encephalopathy, and non-degenerative and degenerative neurologic diseases (including the dementias)." (ASHA, 2005). CCDs are differentiated from linguistic impairments (aphasias) and motor speech disorders (different types of dysarthria, and apraxia of speech) using overly concrete, poorly organised, and socially insensitive communication despite preserved speech and language skills (ASHA, 2005; Elbourn, Togher, Kenny & Power, 2017). CCDs may be caused and complicated by impairments of attention, memory, executive functions, and pragmatics. Symptoms will vary by aetiology, patterns of brain damage, and individual differences in the neural organisation of cognitive functions (ASHA, 2005; Mcdonald et al., 2014).

Familiar communication partner

Communication partners (CPs) refer to individuals in the environment with whom the person with TBI may interact (Simmons-Mackie, Raymer & Cherney, 2016). CPs are on the opposite end of the sender-receiver connection during an interaction. FCPs (commonly referred to as ECPs) are those who commonly engage and interact with the individual with TBI, i.e. family members

or relatives, friends and significant others or health care providers. FCPs may have regular interactions with individuals, thus may be able to support and facilitate communication either based on previous communication training programmes or personal experience (Simmons-Mackie et al., 2016).

Unfamiliar communication partner

UFCPs are those who have had limited or no interaction with any individuals with TBI nor the participant with TBI themselves, i.e. strangers, public service providers (Simmons-Mackie et al., 2016). UFCPs may have never received training and will not necessarily be equipped with strategies to facilitate and support communication with individuals with TBI.

1.4. Outline of chapters

Chapter 1: Introduction to the research topic, problem statement, research question, rationale and terminology as used in the dissertation.

Chapter 2: The methodology used in the research study.

Chapter 3: An article based on the research study as submitted to the Journal of Disability and Rehabilitation.

Chapter 4: Clinical and theoretical implications and conclusion of the study.

Chapter 2: Method

This chapter provides a comprehensive explanation of the research methodology followed in the study. The aims and research design, ethical considerations, participants, materials, and procedures are discussed. The chapter concludes with a discussion of the reliability and the validity of the study.

2.1. Aim

This study aimed to compare the communication-interactions of individuals with mild to moderate TBI with both FCPs and UFCPs. This study further aimed to compare and describe the subtle differences in support provided by both FCPs and UFCPs and the degree of participation of individuals with TBI during communication-interactions with both FCPs and UFCPs.

2.2. Research design

A prospective case-series design was adopted to compare similarities and differences between eight participants with mild to moderate TBI and their interactions with FCPs and UFCPs (Leedy & Ormrod, 2014). A case series design helps describe characteristics or outcomes in a particular group of people, therefore appropriate for describing the communicative-interactions of the eight individuals with mild to moderate TBI in this study (Leedy & Ormrod, 2014). Observed differences between the two groups established if the degree of communication-interaction is associated with CP familiarity using procedures described previously (Togher et al., 2010).

A quantitative research design was selected; as communication-interaction characteristics are objectively described in numerical terms (Leavy, 2017). The Adapted Kagan scales described by Togher et al. (2010) provided quantitative data, which assisted in measuring variables and testing the relationship between CP familiarity and interactions with individuals with TBI in structured settings.

2.3. Ethical considerations

Research ethics concern the morality of human conduct to obtaining and reporting of research data accurately and honestly while also communicating the utmost respect to human

participants' rights and safety throughout the research process (Chadwick, Have & Meslin, 2011). Permission to recruit participants and conduct the research study was obtained from the relevant rehabilitation sites (Appendix A). Subsequently, ethical clearance was obtained from the Faculty of Humanities at the University of Pretoria (Appendix B). The following ethical considerations were considered throughout this study:

2.3.1. Protection of human participants

One of the primary considerations in the ethical conduct of research is protecting the well-being of the persons who participate in the research (Nelson, 2013). The researcher acknowledged possible aspects that could potentially harm the well-being of the participants. Protection of the participants was achieved by providing information in simple, lay terms and supplementing the information with adapted information leaflets (Appendix C) in order to establish improved understanding (Johnson-Greene, 2010). If necessary, information was repeated, and additional time was provided for questions to be asked and answered. If necessary, the appropriate referrals and recommendations were made upon newly identified communication/hearing difficulties, and if individuals had not yet seen SLTs for treatment of the identified difficulty. Through these processes, augmented comprehension of the data-collection process was generated (Nelson, 2013).

2.3.2. Autonomy

When specific people are intentionally recruited for participation in research, it is vital that they are informed of the nature of the research and provided with an opportunity to decide whether they wish to participate (Leedy & Ormrod, 2014). Informed consent aims to promote autonomy and self-determination through an exchange of appropriate information that allows decision-making, which is based on a complete understanding of potential risks and benefits involved (Johnson-Greene, 2010). Detailed information leaflets were provided to all potential participants, and informed consent was obtained from four separate groups; participants with a confirmed diagnosis of TBI, significant others of the participants with TBI, participants termed as FCPs, and participants who classified as UFCPs (see Appendix C for all letters).

Inherent to the concept of informed consent are the premises of voluntarism, understanding, and decision-making capacity (Cosac, 2017). The former capacities in persons with TBI may be impaired regardless of a potential participant's actual abilities. Capacity to consent has been a particular concern when persons have known or suspected cognitive impairments (Johnson-Greene, 2010). The consent process, therefore, included additional supports such as pictorial diagrammatic representations (Appendix C) to allow for a greater understanding of the study protocol. The prospective participants received enough information regarding the nature of the study and the purpose of the data being collected. Participants were then allowed to make an informed decision regarding study participation and were informed of their right to withdraw regardless of consent, at any time as convenient to them. The participants then provided a written agreement of voluntary consent of their participation. In this study, all participants were in a capacity to provide written consent before the commencement of data collection.

2.3.3. Confidentiality, anonymity and privacy

With data management, there is always a need for researchers to ensure the confidentiality and privacy of the information obtained from the research participants (ASHA, 2009). Names and identifying particulars of the participants were only available to the researcher, the research supervisors and the second-rater. Extreme care was taken to treat these particulars with confidentiality. Confidentiality and privacy were further assured using identification codes rather than the participants' names on all research documents and avoiding any mentioning of participants' names or research sites' names in any publications or presentations. Participants and their legal guardians were informed that the data described in the research article and dissertation would be done so using codes. All the data for this study is stored on a password-protected computer and in hard copy in the Communication Pathology Building (room 2-12) according to the University of Pretoria's guidelines for at least 15 years. This study's data collection approach made use of video-recording. Thus special concerns for maintaining confidentiality were also considered (Nelson, 2013). Confidentiality of video recordings was managed through storing of the recordings in a secure office and following the same guidelines as stipulated by the University of Pretoria. Research team members such as the researcher, the supervisors, and the second-rater always reviewed the video recordings in designated locations

to ensure confidentiality. Researchers are expected to bring no harm to participants and the risks involved should not outweigh the expected risks of everyday living (Leedy & Ormrod, 2014). An observation of the communication-interaction was conducted during the participants' scheduled visit to the rehabilitation site to accommodate the participant as best as possible. A single video recording of each communication-interaction was obtained for purposes of observation by the researcher in a private room at the rehabilitation site.

2.3.4. Honesty with professional colleagues

The search for truth and its unbiased reporting are the ultimate goals of conducting scientific research (Marco & Larkin, 2000). The reporting of research data should be an objective task with acknowledgement and recognition to the contributions of other studies and researchers. Every effort was made to report results clearly and truthfully, using the most scientifically accurate methods.

2.4. Participants

2.4.1. Setting

During March 2018 to May 2018, eight participants with mild-moderate TBI were recruited from a local non-profit brain injury organisation and an outpatient rehabilitation facility in Pretoria, South Africa.

2.4.2. Participant selection criteria

The study included three separate groups of participants. A group of eight participants diagnosed with mild to moderate TBI, a group of eight FCPs, and the third group of eight UFCPs. Table 1 and 2 illustrate the inclusion and exclusion criteria for the various groups involved in the study. Participant selection criteria were based on a similar study by Togher et al. (2010). Participants with TBI were selected using purposive sampling. This method, as described by Etikan (2016), is the careful selection of a participant due to the qualities the participant possesses, therefore, ensuring only participants that represent the stipulated participant selection criteria, specifically within the TBI population, were included.

Eight FCP were also recruited from the same sites using purposive sampling. The majority of the FCPs (i.e. family members) were nominated to participate by the individual with TBI. Others (i.e. volunteers), were approached by the researcher, based on the recommendation from the relevant SLTs at the sites. Purposive sampling can provide researchers with the justifications to make generalisations from the sample being studied and is based on the judgment of the researcher as to who will contribute the necessary data to justify the study's objectives (Etikan, Musa & Alkassim, 2016; Sharma, 2017). The researcher decides what needs to be known and sets out to include participants who will contribute the information by knowledge or experience. Participants are, therefore, selected based on study purpose with the expectation that each participant will provide unique and rich information of value to the study (Etikan et al., 2016).

Purposive sampling was also used in the selection of UFCP participants. The sample of UFCPs was recruited voluntarily from various other settings, other than the data-collection sites. Participants were contacted by e-mail or phone and invited to take part in the study and then sent a detailed information leaflet. Direct recruitment of the potential UFCP participants involved discussing the nature of the study with adult peers either directly in person, telephonically, or through internet sources such as Facebook. Considerable care was taken to ensure that persons contacted did not feel forced to participate. All CPs were matched with a person with TBI based on their language proficiency in English or Afrikaans (a local language), age, gender and participant availability were also crucial deciding factors. All participant selection criteria are depicted in table 1 and table 2.

Table 1: TBI Participant selection criteria

Individuals with TBI selection criteria	
Inclusion criteria	**Exclusion criteria**
Participants with TBI were required to: 1. Have a confirmed diagnosis of a single episode of a TBI (mild or moderate TBI). 2. Be diagnosed with a TBI at least six to 12 months post-injury, as determined by medical record reviews and computerised tomography (CT) scans or magnetic resonance imaging (MRI) scans. 3. Be an adult aged between 18 and 59 years, thereby excluding individuals with paediatric TBI as well as the effects of ageing on cognition. 4. Present with a CCD based on a severity score from 7-12 obtained in the Scales of Cognitive Abilities for Traumatic Brain Injury [SCATBI] (Adamovich & Henderson, 1992) that correlates with a mild to moderate severity of TBI. 5. Pass a hearing screening to rule out the effects of a hearing loss. 6. Be proficient in English or Afrikaans. For example, participants should at least be able to converse fluently in either English or Afrikaans with no overt signs of communication barriers or second language influence. 7. Have FCP; i.e. a close friend, family member, parent or caregiver, who were willing to participate in the study.	Exclusion criteria included the following: 1. Presence of aphasia (a specific impairment of basic language function consequent to brain damage), the presence of psychiatric diagnoses, other acquired/non-traumatic brain injury, or degenerative neurological conditions. 2. Individuals with poor language proficiency in either English or Afrikaans. 3. Presence of a hearing loss.

Table 2 depicts all relevant CP participant selection criteria that were taken into consideration for this study.

Table 2: CP Participant selection criteria

CP selection criteria		
Groups	**Familiar communication partners (FCPs)**	**Unfamiliar communication partners (UFCPs)**
Inclusion criteria	1. Aged 18 years and older. 2. Proficient in the language that the individual with TBI speaks (i.e. English or Afrikaans). 3. Pass a hearing screening to rule out the effects of hearing loss. 4. They have no history or presence of any cognitive-communicative difficulties.	1. Aged 18 years and older. 2. Proficient in the language that the individual with TBI speaks (i.e. English or Afrikaans). 3. Pass a hearing screening to rule out the effects of hearing loss. 4. They have no history or presence of any cognitive-communicative difficulties. 5. They have had no previous engagement with individuals with TBI nor the participant who has a TBI (i.e. an individual unknown to the participant with TBI).
Exclusion criteria	1. The presence of a communication deficit or a hearing loss, 2. Therapists of the person with TBI.	1. They present with a communication deficit or a hearing loss. 2. They are therapists or professionals who may also work with individuals with TBI.

2.4.3. Participant selection procedures

Once permission was obtained from the data collection sites and ethical clearance was received, the researcher approached prospective research participants. After informed consent was requested and provided by participants, participant selection was solely based on the study's stipulated inclusion and exclusion criteria. This study's small sample size may be attributed to the limited time frame in which data collection could take place and the limited number of individuals with TBI falling into the set criteria within this time frame.

Formal measures used to determine further participant candidacy are presented in Figure 1. The materials used to classify the extent of cognitive and social communication impairment associated with the participant with TBI is presented as follows.

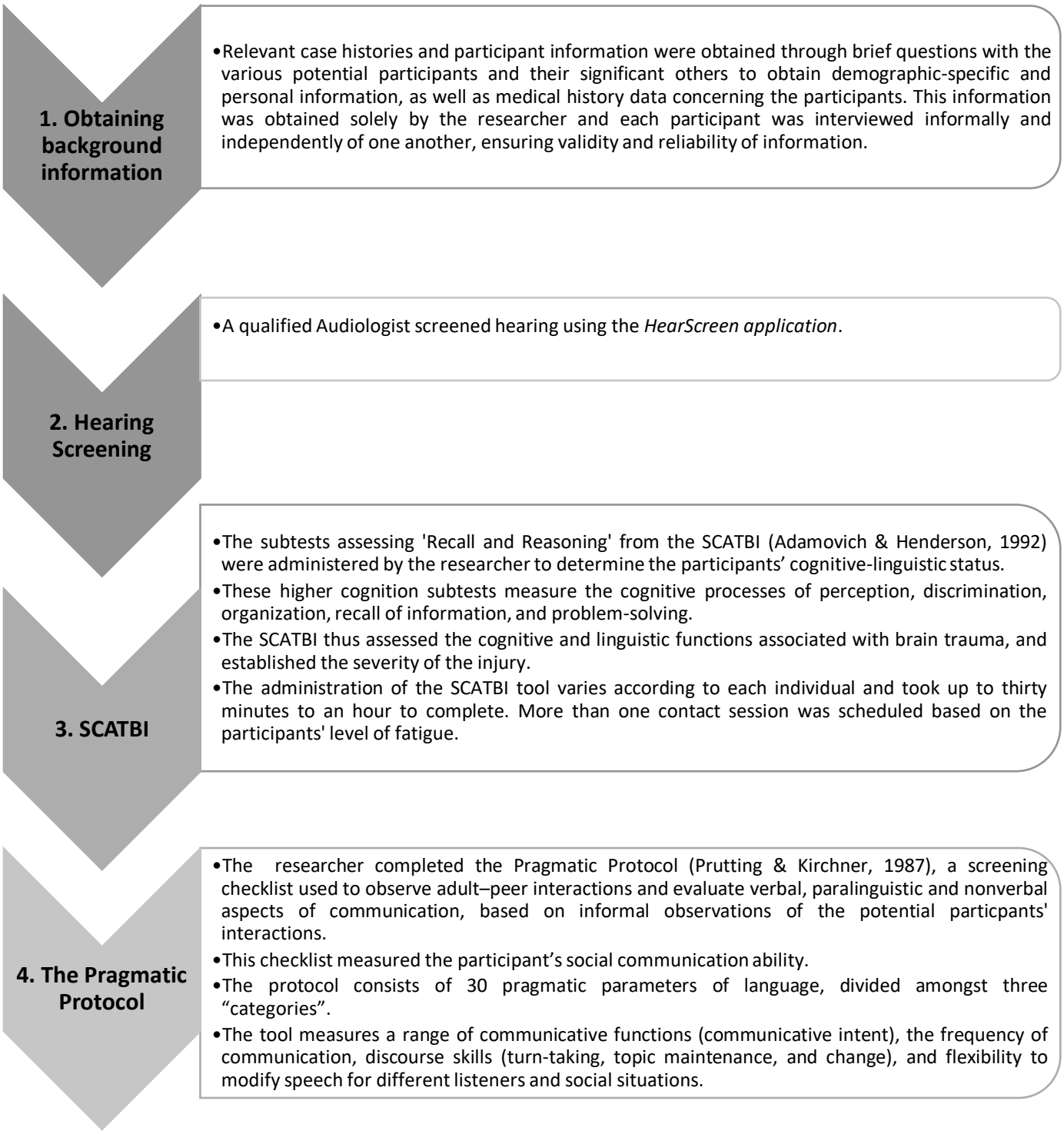

Figure 1: Formal measures used to establish participation candidacy

Key: SCATBI = Scales of Cognitive Abilities for Traumatic Brain Injury (Adamovich & Henderson, 1992)

Figure 1 shows that the researcher scored SCATBI results according to rater's manual (Adamovich & Henderson, 1992). All participant details were coded for purposes of upholding the promise of confidentiality. Based on these scores (7-12 out of 17) and the other measures' results, as stated in figure 1, candidacy for participation in the study could be confirmed. Upon candidacy establishment, a final group of participants with mild (n=7) to moderate (n=1) TBI were selected for inclusion in the study.

2.4.4. Participant description

Initially, eighteen participants with TBI were considered for inclusion. Ten participants did not meet the selection criteria for reasons such as declining participation (n=1), the effects of ageing on cognition (n=1) and TBI severity (n=1). Upon determining candidacy, six participants were excluded due to concerns regarding second language influence (n=6), and one due to a hearing loss (n=1). Finally, only eight adult participants met the stipulated inclusion criteria. Table 3 provides the characteristics of the participants.

Table 3: Characteristics of the participants with TBI (n=8)

Participant	Age (years)	Sex	Type TBI	Time post-TBI (years)	SCATBI severity score	Highest level of education	Occupation pre-injury
P001	40	Male	MVA	20	11 - Mild	Diploma	Student
P002	51	Female	GSW	8	11 - Mild	Degree	Psychiatrist
P003	39	Male	Assault	4	9 - Moderate	Degree	Lawyer
P004	49	Male	MVA	3	10 - Mild	Degree	Civil Engineer
P005	34	Male	MVA	12	11 - Mild	High school	None
P006	50	Male	MVA	**7**	12 - Mild	Degree	IT Software Engineer
P007	34	Female	MVA	19	10 - Mild	High school	None
P008	55	Female	MVA	8	11 - Mild	Degree	Social worker

Motor vehicle accident (MVA), gunshot wound (GSW)

According to table 3, most of the participants in the TBI group were male (n=5; 62.5%). Participants varied in age from 34 to 55 years of age. Most participants (n=6; 75%) sustained a TBI as a result of a motor vehicle accident (MVA). Post-injury time ranged from three to 20 years. Many participants had tertiary education. Most of the sample obtained a 'mild' score on the SCATBI, with only one participant scoring a 'moderate' on the SCATBI.

FCP participants were family members and carers who regularly interacted with the person with TBI. Volunteers refer to individuals who, through years of volunteer work, constant interaction and participation in activities at Brainlife NPO, have formed personal relationships with members with TBI; therefore, were deemed FCPs. FCP characteristics are shown in table 4:

Table 4: Characteristics of FCP participants (n=8)

Participant	Sex	Age (years)	Highest level of education	The time has known TBI participant (years)	Type of relationship	Known before TBI (yes/no)
FCP1	Male	81	Degree	40	Father	Yes
FCP2	Female	73	Diploma	5	Friend/volunteer	No
FCP3	Female	37	Degree	20	Wife	Yes
FCP4	Female	40	Degree	10	Wife	Yes
FCP5	Female	60	High school	34	Mother	Yes
FCP6	Female	65	Degree	3	Friend/volunteer	Yes
FCP7	Female	67	Degree	3	Volunteer	No
FCP8	Female	23	Degree	23	Daughter	Yes

FCPs were mainly female (n=7; 87.5%) aged 23 to 81 years. Generally, FCPs were close relatives of the participant with TBI (n=5; 62.5%). The UFCP participant characteristics are shown in table 5. UFCPs consisted of mostly females (75%; n=6) ranging from 21 to 55 years of age.

Table 5: Characteristics of UFCP participants (n=8)

Participant	Sex	Age (years)	Highest level of Education
UFCP1	Male	21	High school
UFCP2	Female	53	Degree
UFCP3	Female	21	High school
UFCP4	Female	55	Degree
UFCP5	Female	24	Degree
UFCP6	Male	28	High school
UFCP7	Female	44	Degree
UFCP8	Female	23	Degree

2.5. Materials and apparatus

After candidacy for the study was determined and participants were selected, the participants' communication interactions with FCPs and UFCPs were video recorded. Recordings with FCPs and UFCPs took place sequentially within at least 30 minutes of one another and then scored using the *Adapted Measure of Participation in Conversation (MPC)* and the *Adapted Measure of Support in Conversation (MSC) Kagan scales* by Togher et al., (2010). *The Adapted Kagan scales* (Appendix D), were adapted from the original Kagan scales developed by Kagan et al. (2004; 2001). Togher et al. (2010) adapted the MSC and MPC to capture the specific conversational supports that were relevant to the interactions of individuals with TBI. There has been a growing focus on functional communication (i.e. communication that occurs in natural, day-to-day environments), which has resulted in the creation of assessment procedures, which can be used to describe the individual with a TBI's communication separate from the clinical environment (McDonald et al., 2014). For this reason, rating scales such as the Adapted Kagan scales (Togher et al., 2010) have been developed in order to provide detailed ratings of specific communicative behaviours that occur within naturalistic settings. The Adapted Kagan scales is the most viable tool to implement for this study as it is the first scale to measure the CP during interactions with a person with a TBI (Togher et al., 2010). The Adapted MPC and MSC scales is a tool that primarily focuses on the skills and abilities of CPs in providing conversational support

to the individual with TBI and thus may be valuable in detecting variations following training of communication partners (Togher et al., 2010).

These tools were selected as it evaluates the contributions of both the participant with TBI and their CP during everyday interactions (Togher et al., 2010). The scale consists of two parts. The first measure, the Adapted MPC, measures the contributions to interactions by the participant with TBI. There are two subscales, namely 'Interaction' and 'Transaction' (measuring the participant with TBI's ability to be part of the conversation, i.e. contributing positively to the interaction and taking responsibility for maintaining the exchange of information and content). A nine-point Likert scale is used, presented from 0 (no participation at all), through two (some participation), to four being the highest score (full and appropriate participation) with 0.5 increment levels for ease of scoring.

The second measure, the Adapted MSC evaluates the contributions of the communication partner to the interaction on a nine-point scale from zero to four with 0.5 increments, like the MPC. The scale anchors range from zero (not supportive) through two (basic skills in support) to four (highly skilled support). It consists of two subscales: "Acknowledging competence" and "Revealing competence" (measuring the competence of the communication partner in supporting the potential participation of the person with TBI, i.e. through interacting with equal partnership and adapting/modifying the way they talk to help generate a better understanding of the conversation). Revealing competence further encompasses three aspects: (RC1) ensuring the adult understands, (RC2) ensuring the adult has a means of responding, and (RC3) verification. These aspects are rated and averaged to form the "Revealing competence" score (McDonald et al., 2014; Tu et al., 2011).

Further apparatus used for data collection are shown in figure 2.

Apparatus used:	
	1. Video camera recorders: Two GoPro cameras, the GoPro Hero and the digital GoPro HERO5, were used for the recording of interactions. A digital GoPro HERO5 Black v02.60 was used due to it's voice control functions and excellent video image quality. The GoPro Hero also has good voice control, providing HD recordings and is easy to use.
	2. DSLR Tripods: DSLR Tripods were necessary for optimal placement of the video cameras and to ensure unobtrusive recordings.
	3. Android stopwatch application: A stopwatch was used to determine the duration of the interaction session in minutes

Figure 2: Apparatus used in the data collection

The data collection sheet (Appendix E) was compiled for the current study and is based on the Adapted Kagan scales (Togher et al. 2010) for ease of scoring when analysing and rating video recordings.

2.6. Research procedures

2.6.1. Data collection

Two separate communication contexts were compared using 15-minute video recordings. Two conversational video samples per participant with TBI (i.e. in conversation with a FCP and an UFCP) was obtained and rated according to the Adapted Kagan scales (Togher et al., 2010). All data were collected by a single researcher, an SLT registered with the Health Professions Council of South Africa (HPCSA) and trained in the procedures. The settings wherein communication-interaction took place were kept consistent, promoting and ensuring optimal and reliable results were obtained for each CP condition throughout the study (Leedy & Ormrod, 2014). A private and separate room was made available at the relevant rehabilitation facilities or at participants' residence to ensure no external sound or actions would interfere with the data collection process. All participants were informed and consented to video

recorder presence during interactions. Further counselling and explaining prior to the data collection recordings were provided in order to account for video recorder influence. Thus, clear video samples were obtained for optimal data analysis purposes. The necessary video and sound recording equipment were set up before the interactions. Two video cameras were left to record in a quiet room, and the recordings were made without a third person present, so as not to interrupt the communication-interaction. Participants with TBI and their CPs were asked to engage in one of three constructed conversational starter topics (Figure 3), adapted and based on the work by Togher et al. (Togher et al., 2010). The exact process was repeated for the interaction between participants with TBI and UFCPs. For each participants' convenience, the sample of video recordings were collected according to participant schedules and therapy room availability in one contact session. Video samples of interactions with UFCPs and FCPs were obtained sequentially, usually within a time frame of 30 minutes apart. Thus, the measurement of all eight participants' suitability occurred across one-to-two contact sessions, depending on the participants' endurance and level of fatigue, and the collection of video samples occurred based on participant availability and convenience across different days and times. Conversation starters are shown in figure 3.

Conversation starters based on Togher et al. (2010):	***1)*** *Together, we want you to come up with a list of situations you are expecting to face over the next four weeks or so where communication is important to you both. It might be something routine such as a family dinner or a social event. In the next 10 minutes, come up with a list of these situations together and WHY they are important. We have given you a pen and paper and a reminder of the instructions to help.*
	2) *We are collecting information about TBI for people with TBI and their families, friends, and carers. We would like you to generate five ideas regarding what you have found useful during your recovery. This may be information about: therapy, ways of dealing with stress, depression, practical ideas, how to deal with your family, how to deal with the medical system, financial or legal matters or anything that you wish you had known after your head injury.*
	3) *I have a friend who never seems to have a good holiday. Last holiday she went to the Kruger National Park and it rained, and the bush and trees were so thick she could not see any wild animals. To top it all off she was bitten all over by mosquitos and it was terribly itchy. Has anything like that ever happened to you? We'd like you to generate five ideas regarding what you'd recommend to other people going on a holiday. So, simple practical advice about how to choose your holiday as well as advice about dealing with all elements of a holiday.*

Figure 3: Constructed conversational starters to stimulate interaction between participants with TBI and FCPs and UFCPs

2.6.2. Raters

The researcher initially rated all the video recordings. Twenty-five percent of the recordings were rated by a second-rater, who is a qualified SLT, registered with the HPCSA as an independent practitioner, with eight years of clinical experience in the treatment of adult neurogenic communication disorders. Inconsistencies or misconceptions were discussed between the raters before commencing with the rating of the data.

2.6.3. Procedure for rating

The scoring protocol of the Adapted Kagan scales (Togher et al., 2010) was used to analyse and rate video recordings of participants and their communication interaction with FCPs and UFCPs (Appendix D). A total of 16 structured, videotaped conversation recordings with participants with TBI and their FCPs and UFCPs were coded, randomised and rated independently by the researcher using the Adapted MPC and MSC. The second rater scored twenty-five percent of each set of video recordings in the same manner. As in the study conducted by Togher et al.

(2010), training of the Adapted Kagan scales included familiarising the two raters with the scale descriptors and the rater's scoring manual. Any inconsistencies or misconceptions were discussed before commencing with the rating of the video recordings. Comparisons between the two raters' scores and deductions regarding inter-rater reliability were possible.

2.6.4. Data analysis

All data were analysed using Statistical Package for the Social Sciences (SPSS) version 25 (IBM Corp., 2017) by a statistician. The Shapiro-Wilk tests were used to test for normality across the data. As the data differs from normality, non-parametric tests were used. The Mann-Whitney U-test was used as the non-parametric alternative test to the independent sample t-test. Statistically significant differences were found when the p-value is less than 0.05. Descriptive statistics were also used.

2.7. Reliability and validity

2.7.1. Reliability

Reliability is the consistency with which a particular test, procedure or tool will yield specific, consistent results in different circumstances, assuming the concept being measured has not changed (Leedy & Ormrod, 2014). The Adapted Kagan scales is recommended for use in individuals with TBI (Togher et al., 2010) and is a published material specifically designed for persons with TBI. The use of published outcome measures, namely the Adapted Kagan scales (MPC and MSC), strengthened the research study's reliability (Togher et al., 2010). The measurement of both Adapted Kagan scales has proven to be sensitive outcome measures for CPT where CPs were paid caregivers (Behn et al., 2012) and family and friends (Togher et al., 2013).

The Kagan scales is originally developed for use with volunteers in conversations with people with aphasia (Kagan, Black, Duchan, Simmons-Mackie, & Square, 2001; Kagan, et al., 2004). The structure and main elements of the Kagan scales, however, provide a solid basis for use in TBI (Togher et al., 2010). The scales further provide holistic quantitative measurements of different qualitative aspects of communication. Psychometric data for the original Kagan scales (Kagan et

al., 2004) present with favourable reliability and validity, indicating the robust nature of this measure when evaluating interactions of persons with aphasia and volunteer CPs (Togher et al., 2010).

Inter-rater reliability refers to the extent to which two or more individuals evaluating the same performance outcome delivers corresponding results (Leedy & Ormrod, 2014). Inter-rater reliability on the Patient Participation (MPC) and Partner Support (MSC) measures ranging between .91 and .96 ($p < 0.001$). Excellent inter-rater agreement was established for both the Adapted MSC (ICC = 0.85– 0.97) and the Adapted MPC (ICC = 0.84–0.89) (Togher et al., 2010). Intra-rater agreement was also strong (MSC: ICC = 0.80–0.90; MPC: ICC = 0.81–0.92) (McDonald et al., 2014; Togher et al., 2010). Over 90% of all ratings scored within 0.5 on a 9-point scale. According to Togher et al. (2010), the intraclass correlation (ICC) ratings were comparable with those reported by Kagan et al. (2001, 2004); further establishing the reliability of the Adapted Kagan scales (McDonald et al., 2014; Togher et al., 2010). It can, therefore, be assumed that clinicians are likely to score the Adapted Kagan scales similarly.

The second rater scored twenty-five per cent of each set of video recordings in the same manner as the researcher, thus, enhancing the reliability of the study.

2.7.2. Validity

Validity is the degree to which the measuring procedure is measuring what it is intended to measure (Leedy & Ormrod, 2014). Internal validity was ensured by keeping data collection conditions constant and consistently the same throughout the entirety of the study.

The Adapted Kagan scales was developed and validated against the Kagan scales (Togher et al., 2010). The original MSC and MPC scales were developed for use with volunteers in conversations with people with aphasia (Kagan et al., 2001, 2004). Construct validity has traditionally been defined as the experimental demonstration that a test is measuring the construct it claims to be measuring (Slaney, 2017). Construct validity for the original scales was measured by correlating informal clinical judgements by SLTs of communicative proficiency of individuals with TBI and CPs with MPC and MSC between informal clinical judgement and scores

on all categories of the measures for both raters (rater 1: rho ranged from .87 to .95, $p < .01$–.001; rater 2: rho ranged from .83 to .88, $p < .001$–.003). There was a significant positive correlation, which further demonstrates the construct validity on which the Adapted Kagan scales are based.

The Adapted Kagan scales is the most viable tool to implement for this study as it is the first scale to measure the CP during interactions with a person with a TBI (Togher et al., 2010). Both the Adapted MPC and MSC scales provide a tool that chiefly focuses on the skills and abilities of CPs in providing conversational support to the individual with TBI and thus may be valuable in detecting variations following CPT (Togher et al., 2010). The specificity of the scales shows its ability to accurately identify and describe communication-interactions of individuals with TBI and ECPs, therefore, emphasising the validity and reliability of the Adapted Kagan scales.

Chapter 3: Article

This article was submitted to the journal Disability and Rehabilitation (Appendix F). The format of the article is that of the journal and differs from the rest of the dissertation due to the journal's specified guidelines for authors.

TYPE OF ARTICLE: ORIGINAL ARTICLE

TITLE: Interaction of familiar and unfamiliar communication partners with individuals with traumatic brain injury

Short Running Title: Interaction with individuals with TBI

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TITLE: Interaction of familiar and unfamiliar communication partners with individuals with traumatic brain injury

ABSTRACT

Purpose: Deficits in communication may predominantly impact communication participation after traumatic brain injury, although links between specific communication deficits and the type of communication partner have not yet been determined. This study describes differences in the communication interaction of individuals with traumatic brain injury with familiar and unfamiliar communication partners.

Method: Eight participants with mild to moderate traumatic brain injury participated in fifteen-minute structured conversations with familiar communication partners and unfamiliar communication partners. All communication interactions were rated by a speech-language therapist using the Adapted Kagan scales.

Results: Non-parametric between-group comparisons did not reveal statistically significant differences between interactions of individuals with traumatic brain injury during familiar and unfamiliar communication partner conditions across all subtests on the Adapted Measure of Participation in Conversation. However, when comparing familiar and unfamiliar communication partner performance, significant differences were found on a range of subtests across the Adapted Measure of Support in Conversation.

Conclusion: Poor communication-participation, as evidenced by the Adapted Measure of Participation in Conversation scales, may occur as a result of underlying cognitive-linguistic deficits as a known consequence of traumatic brain injury. Participants with traumatic brain injury may have the potential to participate in interactions if provided with appropriate support. The Adapted Kagan scales may be valuable to speech-language therapists and may guide communication partner training for individuals with mild to moderate traumatic brain injury.

Keywords: Traumatic brain injury, cognitive-communication disorders, conversation, Adapted Kagsn scales, communication partners

INTRODUCTION

Approximately ten million people are affected by traumatic brain injury (TBI) annually, and TBI is fast becoming the most common form of brain injury; making it a significant global public health concern [1,2]. TBI affects a range of aspects of health, and as such, the common consequences of TBI are well-documented throughout the literature [3]. Individuals living with TBI after one year (i.e. the chronic stage) often show communication disorders or difficulties in managing social interactions [4]. Language impairment following TBI are cognitive-communicative in nature [5]. As a result of cognitive-communication difficulties, conversations with people who have TBI have been described as less compelling, less appropriate, less rewarding, and more effortful than conversations involving people without brain injury [6,7]. Research suggests that communication difficulties experienced by people with TBI can be exacerbated by their communication partner's inadequate responses [8]. Given conversations are dynamic, with both participants contributing to the success of interaction, it is essential to consider the potential of communication partners to positively or negatively influence interaction [8]. A comparison of interactions between communication partners and individuals with TBI can, therefore, generate a comprehensive understanding of the overall effect that cognitive-communicative disorders exert on the TBI population.

Impaired discourse is shown to be a distinctive characteristic of cognitive-communicative disorders post-TBI [9]. As discourse plays a vital role in an individual's day-to-day communicative abilities, impaired discourse contributes to the participation restrictions that underlie social isolation commonly experienced among individuals with TBI [10]. Disrupted non-linguistic, cognitive processes such as attention, memory and executive functioning, underlie difficulties with language use [11]. As a consequence, difficulties in engaging in

interactions and pragmatics are specifically affected [4]. Thus, the individual with TBI often relies on communication partners to assume the burden of providing structure for the effective conveying of information [10].

Additionally, increased effort is required of communication partners to repair social interactions with persons with TBI [6]. There is a dearth of information about familiar communication partners' interaction with individuals with TBI. Hence, it is difficult to determine whether the discourse performance of individuals with TBI may be improved in the presence of people with whom they share meaningful social relationships [12]. Attention to the relationship between communication partners and individuals with TBI is a critical feature to consider when determining their ability to communicate successfully during interactions.

Although the literature on communication deficits post-TBI is extensive, current studies surrounding the topic of TBI interactions and discourse are limited [1]. The use of researchers as partners is common practice in studies of communication after a TBI [1,13,14]. McDonald et al. [1] suggest that if partners are in a therapist-client relationship, the roles they assume during communication are predetermined and relatively different to other relationships the person with TBI may have. Considering the interaction between familiar and unfamiliar communication partners with individuals with TBI in South Africa, rather than therapist-client interactions, may provide knowledge for the development of communication intervention programmes for individuals with TBI in other lower-middle-income settings.

It is suggested that communication partners exert both positive and adverse effects on how persons with TBI communicate [15]. Individuals with TBI produce significantly more coherent and cohesive discourse when they speak in familiar contexts, discussing personally relevant topics [7]. Contrastingly, they may have difficulty contributing information in

interactions with unfamiliar communication partners (UFCPs) as UFCPs may exert adverse effects on the interactions. Negative interactions include a lack of shared meaning in personal narratives, resulting in a less effective communication interaction for both parties [16]. Accordingly, different contexts and different communication partners may largely influence how individuals with TBI participate in conversations [7]. This study aimed to describe the communication interactions of individuals with TBI and their familiar communication partners (FCPs), as well as UFCPs.

METHOD

Design of study

A prospective case-series design was used to compare similarities and differences between eight participants with TBI and their interactions with FCP and UFCP [17]. Observed differences between the two groups established if the degree of communication-interaction is associated with communication partner familiarity using procedures described previously [18].

Participants and settings

Eight participants with mild-moderate TBI were recruited from a local non-profit brain injury organization and an outpatient rehabilitation facility in Pretoria, South Africa. Eight FCPs were also recruited from the same sites using purposive sampling. The majority of the FCPs (i.e. family members) were nominated to participate by the individual with TBI. Others (i.e. volunteers), were approached by the researcher, based on the recommendation from the relevant speech-language therapists at the sites. Eight UFCPs were recruited from various settings, other than the data collection sites. Communication partners were matched with a participant with TBI based on their language proficiency in English or Afrikaans (local language). Written informed consent was obtained from all participants using pictorial aids to support persons with TBI.

Participants with TBI were selected based on the following inclusion criteria:

1) adults (18-59 years to rule out the effects of ageing on cognition) with a confirmed diagnosis of a single episode of a TBI (mild to moderate in severity); 2) at least 6-12 months post-injury, as determined by medical record reviews and computerized tomography scan or magnetic resonance imaging scans; 3) with a cognitive-communication disorder based on a Scales of Cognitive Abilities for Traumatic Brain Injury (SCATBI) score ranging from 7-12 out of 17; 4) with language proficiency in either English or Afrikaans; 5) and with normal hearing. Exclusion criteria included the presence of psychiatric diagnoses, aphasia, other acquired/non-traumatic brain injury, or degenerative neurological conditions, and poor language proficiency in either English or Afrikaans. The characteristics of the participants with TBI are shown in table 1.

[Insert Table 1 near here]

Table 1: Characteristics of the participants with TBI (n=8)

Participant	**Age (years)**	**Sex**	**Type TBI**	**Time post-TBI (years)**	**SCATBI Severity score**	**Highest level of education**	**Occupation pre-injury**
P001	40	Male	MVA	20	11 - Mild	Diploma	Student
P002	51	Female	GSW	8	11 - Mild	Degree	Psychiatrist
P003	39	Male	Assault	4	9 - Moderate	Degree	Lawyer
P004	49	Male	MVA	3	10 - Mild	Degree	Civil Engineer
P005	34	Male	MVA	12	11 - Mild	High school	None
P006	50	Male	MVA	**7**	12 - Mild	Degree	IT Software Engineer
P007	34	Female	MVA	19	10 - Mild	High school	None
P008	55	Female	MVA	8	11 - Mild	Degree	Social worker

Motor vehicle accident (MVA), gunshot wound (GSW)

Eighteen participants with TBI were considered for inclusion. Ten participants did not meet the selection criteria for reasons such as declining participation (n=1), the effects of ageing on cognition (n=1) and TBI severity (n=1). Upon determining candidacy measures, six participants were excluded due to concerns regarding second language influence (n=6), and one due to a hearing loss (n=1). Eight adult participants were included, one with moderate TBI and seven with mild TBI. Participants with TBI were mainly male (n=5) aged 34 to 50 years. Female participants (n=3) were aged 34 to 55 years. Most TBIs (n=6) were caused due to a motor vehicle accident, being mild in severity.

FCP participants were 1) family members and carers who regularly interacted with the person with TBI (>18 years); 2) proficient in English or Afrikaans with
3) normal hearing. Exclusion criteria included the presence of a communication deficit or a hearing loss. Therapists of the person with TBI were excluded (Table 2).

[Insert table 2]

Table 2: Characteristics of familiar communication partner participants (n=8)

Participant	**Sex**	**Age (years)**	**Highest level of education**	**The time has known TBI participant (years)**	**Type of relationship**	**Known before TBI (yes/no)**
FCP1	Male	81	Degree	40	Father	Yes
FCP2	Female	73	Diploma	5	Friend/volunteer	No
FCP3	Female	37	Degree	20	Wife	Yes
FCP4	Female	40	Degree	10	Wife	Yes
FCP5	Female	60	High school	34	Mother	Yes
FCP6	Female	65	Degree	3	Friend/volunteer	Yes
FCP7	Female	67	Degree	3	Volunteer	No
FCP8	Female	23	Degree	23	Daughter	Yes

Similar inclusion criteria were stipulated for the UFCP participants. Additional criteria included having had no previous engagement with the participant who has a TBI (see table 3).

[Insert Table 3 here]

Table 3: Characteristics of unfamiliar communication partner participants (n=8)

Participant	**Sex**	**Age (years)**	**Highest level of Education**
UFCP1	Male	21	High school
UFCP2	Female	53	Degree
UFCP3	Female	21	High school
UFCP4	Female	55	Degree
UFCP5	Female	24	Degree
UFCP6	Male	28	High school
UFCP7	Female	44	Degree
UFCP8	Female	23	Degree

FCPs were mainly female (n=7) aged 23 to 73 years. Generally, FCPs were close relatives of the participant with TBI (n=5). UFCPs consisted of mostly females (n=6) ranging from 21 to 55 years of age.

Tests and tasks

The extent of cognitive and social communication impairment was determined to ensure that the selection criteria were met. Relevant case histories and participant information were obtained through brief interviews with the participants and their communication partners. Hearing screenings were then conducted.

The subtests assessing Recall and Reasoning from the SCATBI [19] were administered to determine the participants' cognitive-linguistic status. The SCATBI Recall subtest measures the participant's ability to use strategies during free recall tasks [19]. The Pragmatic Protocol [20] was used to measure the participant's social communication ability. The protocol consists of 30 pragmatic parameters of language, divided amongst three "categories" namely verbal, paralinguistic, and non-verbal. The tool measures a range of communicative functions (communicative intent), the frequency of communication, discourse skills (turn-taking, topic maintenance, and change), and flexibility to modify speech for different listeners and social situations.

After candidacy for the study was determined, the participants' communication interactions with the FCPs and the UFCPs were video recorded and then scored using the Adapted Measure of Participation in Conversation (MPC) and the Adapted Measure of Support in Conversation (MSC) Kagan scales [18]. These tools were selected as they evaluate the contributions of both the participant with TBI and their communication partner during everyday interactions [18]. The scale consists of two parts. The first measure, the Adapted MPC, measures the contributions to interactions by the participant with TBI. There are two subscales, namely "Interaction" and "Transaction" (measuring the participant with TBI's ability to be part of the conversation, i.e. contributing positively to the interaction and taking responsibility for maintaining the exchange of information and content). A nine-point Likert scale was used, presented from 0 (no participation at all), through two (some participation), to four (full and appropriate participation) with 0.5 increment levels for ease of scoring. The second measure, the Adapted MSC, evaluates the contributions of the communication partner to the interaction on a nine-point scale from 0–4 with 0.5 increments, similar to the MPC. The scale anchors range from

zero (not supportive) through two (basic skills in support) to four (highly skilled support). It consists of two subscales: “Acknowledging competence” and “Revealing competence” (measuring the competence of the communication partner in supporting the potential participation of the person with TBI, i.e. through interacting with equal partnership and adapting/modifying the way they talk to help generate a better understanding of the conversation). Revealing competence further encompasses three aspects: RC1, ensuring the adult understands: RC2, ensuring the adult has a means of responding; and RC3, verification. These aspects are rated and averaged to form the “Revealing competence” score [1,21].

Procedure

Two separate communication contexts were compared using 15-minute video recordings. Two conversational video samples per participant with TBI were obtained and rated according to the Adapted Kagan scales [18]. All the data was collected by a single researcher, a speech-language therapist registered with the Health Professions Council of South Africa and trained in the procedures. A video camera was left in a quiet room, and the recordings were made without a third person present, so as not to interrupt the communication-interaction. Participants with TBI and their communication partners were asked to engage in one of three constructed conversational starter topics, based on the work by Togher et al. [18]. An example of the instructions is as follows:

> *Together, I want you to come up with a list of situations you are expecting to face over the next four weeks or so where communication is important to you both. It might be something routine such as a family dinner or a social event. In the next 10-15 minutes, come up with a list of these situations together and discuss WHY they are important to you. I have given you a pen and paper and a reminder of the instructions to help.*

Raters

The researcher, a qualified speech-language therapist, initially rated the video recordings. Twenty-five per cent of the recordings were rated by a second-rater, who is a qualified speech-language therapist with eight years of clinical experience in the treatment of adult neurogenic communication disorders. Inconsistencies or misconceptions were discussed before commencing with the rating of the data.

Procedure for rating

The scoring protocol of the Adapted Kagan scales [18] was used to analyze and rate video recordings of the participants and their communication interaction with FCP and UFCP. A total of eight structured, videotaped conversation recordings with the participants with TBI and their FCP were randomized and rated independently by the first rater using the Adapted MPC and MSC. Then eight structured, videotaped conversation recordings between the participant with TBI and a UFCP were randomized and rated independently by the first rater using the Adapted MPC and MSC. The second rater scored twenty-five per cent of each set of video recordings in the same manner.

Inter-rater reliability

The intraclass correlation coefficient (ICC) was used to evaluate inter-rater reliability. The ICC takes into account both agreement and association, thus making it a more conservative statistic [22] with values above 0.96 indicating excellent reliability [22]. The ICC was calculated for 25% of the video recordings, which were rated by two independent raters. The ICC was 0.972, showing excellent reliability, with a p-value <0.001 indicating that the correlation is significant (as it differs significantly from zero).

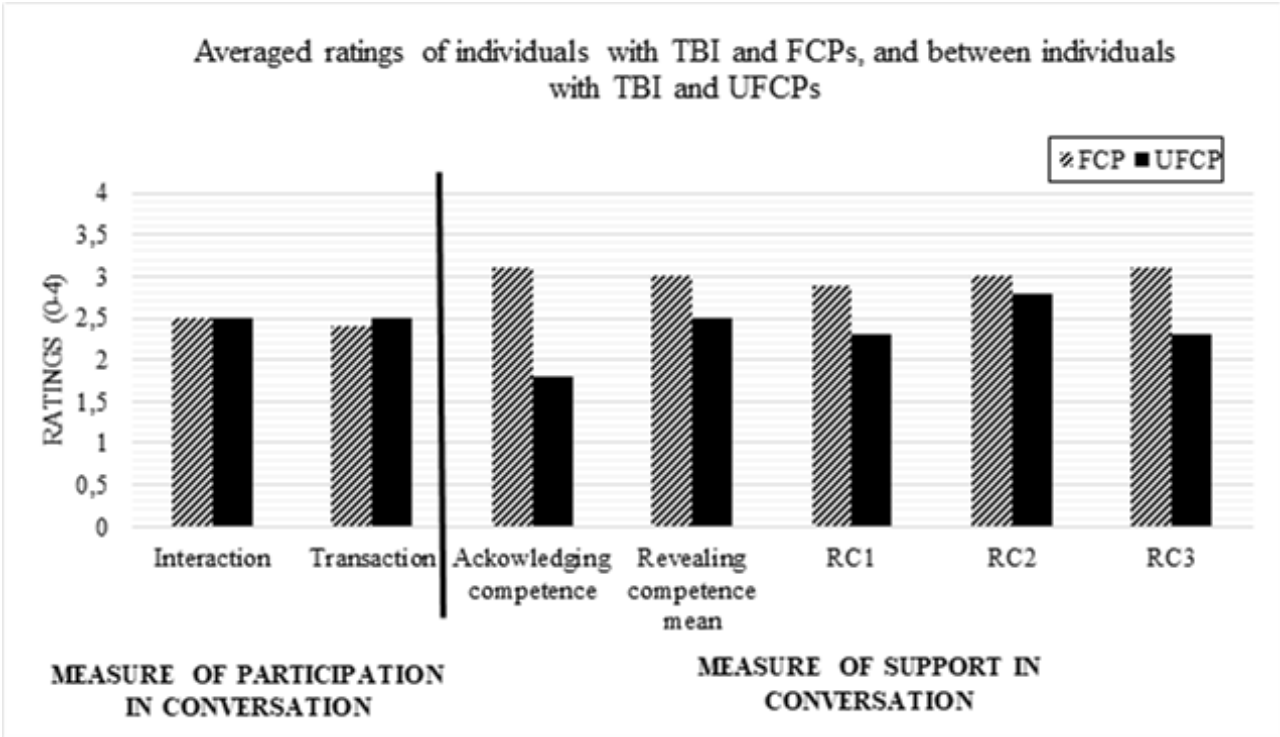
Statistical analysis

All the data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25 [23]. The Shapiro-Wilk tests were used to test for normality across the data. As the data differs from normality, non-parametric tests were used. The Mann-Whitney U-test was used as the nonparametric alternative test to the independent sample t-test. Statistically significant differences were found when the p-value was less than 0.05. Descriptive statistics were also used.

RESULTS

The Adapted MSC and MPC scales refer to a nine-point Likert scale with scale anchors for classification of scoring. Scoring two or less on an aspect indicates minimally skilled support or participation during communication-interaction; whereas a score of three is an indication of moderately skilled support or participation. The averaged ratings scored for each component on the Adapted MSC and MPC are shown in figure 1. FCPs scored, on average, higher than UFCPs on all the Adapted MSC components and participants with TBI performed similarly on all Adapted MPC components despite communication partner familiarity (figure 1).

[Insert figure 1 here]



RC1= ensuring an individual with TBI understands; RC2= ensuring an individual with TBI has a means of responding; RC3= verification by a partner; Revealing Competence Mean= Mean of RC1, RC2 and RC3

Figure 1. Ratings of interactions between individuals with TBI and FCPs, and between individuals with TBI and UFCPs using the Adapted MPC and MSC.

Comparison of interactions between familiar and unfamiliar communication partners on the Adapted MSC

A comparison of the interactions of participants with TBI and FCPs and UFCPs on the Adapted MSC scales is shown in table 4.

[Insert Table 4 near here]

Table 4 Comparison of interactions between FCPs and UFCPs using the Adapted MSC

Mean (SD)				Mann-Whitney U statistic	p-value
Adapted TBI MSC		FCP	UFCP		
AC: Sensitivity to partner	Acknowledge competence when an adult with brain injury is frustrated, acknowledges difficulties	2.4 (0.6781)	1.5 (1.0351)	13.5	0.049
RC1: Ensure adult understands	Response to communicative cues (e.g. reacting to facial expressions indicating confusion)	2.8 (0.5939)	2.1 (0.6781)	13.0	0.044
	Give cues in a conversational manner	3.1 (0.6409)	2.1 (0.6232)	7.5	0.010
	Average Score RC1 MSC	2.9 (0.56558)	2.3 (0.41824)	10.0	0.019
RC2: Ensure adult has a means of responding	Helps partner express thoughts when struggle occurs	3.1 (0.4955)	2.1 (0.5825)	6.5	0.002
RC3: Verification	Verification involves checking (e.g. using yes/no questions)	3.0 (0.8864)	1.9 (1.0155)	13.5	0.046

Familiar communication partner (FCP), unfamiliar communication partner (UFCP), Measure of support in conversation (MSC) Acknowledging competence (AC), Revealing competence, (RC)

There were significant differences between FCPs and UFCPs degree of support on a range of aspects within the “Acknowledging” and “Revealing” components of the scale (table 4). The FCPs acknowledged competence and showed sensitivity significantly more often than UFCPs during interactions when frustration was shown by participants with TBI (p=0.049). FCPs notably acknowledged participants with TBI's difficulties and would say, for example: "I understand what you mean" or "I know what you are trying to say" and expand on their partner's contributions as appropriate. To alleviate communication breakdowns, UFCPs instead employed

humour or comments, for example: “yes, okay” before referring to the resource to maintain the topic or redirect the flow of the conversational task: “So do you have any other holiday tips?”

FCPs were significantly better on a range of aspects within the “Revealing” component of the Adapted MSC. FCPs assisted participants with TBI significantly more than UFCPs ($p=0.019$) when revealing the adults’ overall competence and establishing comprehension of the conversation topic during communication-interactions. FCPs responded to communicative cues ($p=0.044$) indicating confusion, significantly more than UFCPs, and provided participants with TBI with significantly more conversational cues ($p=0.010$) than UFCPs during interactions.

On occasion of communicative breakdowns, or when participants with TBI required help with the expression of thoughts, FCPs revealed competence and ensured that their partners had a means of responding significantly more than UFCPs did during interactions ($p=0.002$). Significantly more verification strategies, such as checking that participants with TBIs’ implied meanings were correctly interpreted, were employed by FCPs than UFCPs ($p=0.046$).

Clinically relevant findings on the Adapted MSC

Certain aspects of substantial clinical value were revealed across the “Acknowledging” and “Revealing” components of the Adapted MSC table 5). Differences in ratings of more than 0.5 points-were considered to be sufficiently substantial to indicate clinical differences in the degree of communication partner supports and participation of participants with TBI. This decision was made by the authors based on previous research using the Adapted Kagan scales [21]. Aspects of substantial clinical value across the Adapted MSC are shown in table 5.

[Insert Table 5 near here]

Table 5 Clinically relevant findings on the Adapted MSC

Mean				Absolute Difference
Adapted TBI MSC		FCP	UFCP	
AC Natural adult talk appropriate to the context	Uses collaborative talk (rather than teaching/testing)	3.3	2.8	0.5
	Uses true questions rather than testing questions	3.3	2.8	0.5
AC Sensitivity to partner	Incorrect/unclear responses handled respectfully by giving correct info in a non-punitive manner	3.0	2.1	0.9
RC 1 Ensure adult understands	Nonverbal adaptations (e.g. gesture, writing, resources)	2.7	2.1	0.6
	Provides an appropriate level of cognitive support (e.g. making notes)	2.8	2.3	0.5
	Makes connections between topics, reviews organization of information (e.g. summarizes)	2.9	2.2	0.7
RC 3 Verification	Response to communicative cues (e.g. infers intended message of the person with brain injury, based on all available cues)	3.3	2.4	0.9
	Confirms understanding of what has been said (paraphrasing, checking)	3.0	2.5	0.5
	Uses clarifying questions as appropriate	3.2	2.4	0.8
	Average: MSC RC 3 (Accuracy of adult's response not assumed)	3.1	2.3	0.8

Traumatic brain injury (TBI), Measure of Support in Conversation (MSC), Familiar communication partner (FCP), unfamiliar communication partner (UFCP), Acknowledging competence (AC), Revealing competence (RC)

FCPs used natural adult talk appropriate to the context more frequently and established a collaborative communication style using true rather than testing questions. Findings also show

that FCPs were better at providing information non-punitively than UFCPs. FCPs also made nonverbal adaptations to guarantee that participants with TBI all together grasped the communication-interaction substantially more than UFCPs. FCPs were also substantially better at referring to additional cognitive support materials, supplementing comprehension, and ultimately enabling the participation of participants with TBI. FCPs again supplemented comprehension by linking topics, reviewing and organizing information substantially more than UFCPs. Averaged ratings for the "RC3" component of the Adapted MSC (figure 1) demonstrated that FCPs were substantially more adept at implementing various verification strategies than UFCPs were. FCPs inferred participants with TBIs' intended message based on all available cues substantially more than UFCPs. FCPs were also better equipped at paraphrasing as a form of checking information than UFCPs, and they implemented clarifying questions appropriately. Using the Adapted Kagan scales, varying degrees of facilitating and or debilitating communication partner support came to light. These aspects are of clinical value, emphasizing the consequence of communication partner familiarity on the degree of communication-interaction participation.

Comparison of interactions between individuals with TBI and familiar communication partner as well as unfamiliar communication partner on the Adapted MPC

No significant differences between the interactions of participants with TBI and FCPs and UFCPs could be found on the Adapted MPC (figure 1). Findings disclose the minimal extent of participation by participants with TBI in both the "Transaction" and "Interaction" components with both FCPs and UFCPs (figure 1). Despite no statistically significant differences and minimal substantial clinical differences across the Adapted MPC, certain findings are highlighted for their clinical relevance.

Participants with TBI effectively utilized supports offered by both FCPs and UFCPs to maintain the flow of the interaction. Participants with TBI asked more topic follow-up questions during interactions with FCPs than with UFCPs and actively listened and acknowledged UFCP's contributions more so than those of FCPs. Interactions with FCPs were somewhat less pragmatically appropriate than those with UFCPs.

Participants with TBI actively participated across the "Transaction" component of the Adapted MPC during both sets of communication partners. The averaged "Transaction" ratings (figure 1) demonstrated a marginal difference between conversations with FCPs and those with UFCPs.

Participants with TBI were able to maintain the exchange of information by sharing personal experiences/feelings more with UFCPs than with FCPs.

Despite aspects of sufficient participation, elements of inadequate participation also came to light. Participants with TBI faintly invited their communication partners to share information to maintain the conversational flow; this task would often solely become the responsibility of the communication partners. Likewise, participation in aspects of questioning was minimal across all transactions. However, participants with TBI were observed to request information more readily with FCPs than with UFCPs.

DISCUSSION

Using the Adapted MPC and MSC scales in analyzing interactions [18], this study aimed to describe communication-interactions of participants with TBI and both FCPs and UFCPs. Findings demonstrated that FCPs, more so than UFCPs, were fairly good at supporting and enabling participation of participants with TBI; however, this support was not without flaw. The communication partners support provided only alleviated the effects of participants with TBIs'

underlying cognitive-communication disorder to some degree. No statistically significant difference was found between interactions with various communication partners. The data emphasized that individuals with TBI still need structured support to participate functionally in communication-interactions. Communication partner training by speech-language therapists must, therefore specifically focus on social cognition and treatment of cognitive-communication disorder; a known hallmark of TBI [24].

Communication difficulties in TBI are persistent long after the onset of the injury; with reports documenting up to 35 years post-injury [25]. Findings showed that participants with TBI might have persisting cognitive-communication disorder, ultimately implicating their participation during communication-interactions. The associated underlying effects of a cognitive-communication disorder, therefore, hinders communication participation for these individuals despite conversational scaffolding provided by competently trained or experienced communication partners [10]. Communication partner training has been viewed as an essential component in the intervention of individuals with TBI [24,26]. Findings of the current study confirm that certain supports offered by various communication partners positively influenced participants with TBIs' participation; further accentuating the benefit of communication partner training in communication rehabilitation with TBI [26]. These results provide speech-language therapists with relevant information regarding the inclusion of UFCPs and FCPs in the management of cognitive-communication disorders for individuals with TBI. Speech-language therapists need to explore this avenue to provide holistic and evidence-based intervention and to improve the efficiency of the standardized implementation of communication partner training in health services.

This study furthermore adds to the literature demonstrating the value of the use of the adapted form of the MSC and MPC scales [6,18,21,27–29]. The Adapted MSC rating scales clearly differentiated FCPs and UFCPs degree of support provided in the structured interactions with participants with TBI. This study showed that both FCPs and UFCPs interaction styles might exert different facilitating or restrictive behaviours; ultimately impacting the communication participation of participants with TBIs.

The findings suggest that participants with TBI participated similarly across the "Interaction" and "Transaction" components (figure 1) of the Adapted MPC regardless of varying communication partners. Despite no statistically significant differences, the degree of participation displayed by participants with TBI with FCPs in contrast to UFCPs was clinically relevant. The averaged "Interaction" ratings (figure 1) showed that participants with TBI took increased responsibility in interactions with both sets of communication partners. Despite the familiarity or lack thereof, participants with TBI were empowered to engage in socially meaningful conversations with varying communication partners; indicating that, with increased support, they were able to contribute sufficient information during interactions. These findings are in accordance with results from a case study by Tu et al. [21] who found that participants with TBI tended to share more information with familiar people and when given direction by communication partners [21]. Participants with TBI rarely acknowledged communication partner frustrations or competencies but participated in the maintenance of interactions through compensatory strategies. For example, when referring back to a previous discussion, they used cognitive supports, such as written lists, which aided interaction. Performance may have been influenced by learnt compensatory strategies resulting from previous interventions.

Participants with TBI established regular eye-contact, showed appropriate body posture and were generally pragmatically appropriate in turn-taking and comprehension of requests/prompts. Decreased initiation and variation of topic maintenance, impaired understanding, and less evident use of gestures and prosody, tone, and rhythm were apparent. These pragmatic difficulties are known communicative difficulties of people with TBI [4,5,24,26]. These findings corroborate with typical pragmatic fallouts that are expected during interactions with individuals with TBI [4,15,30].

Findings across the “Transaction” component (figure 1) suggested that participants with TBI were not as involved with the construction of the content of conversations with FCPs as compared to those with UFCPs. Altogether, participants with TBI were given more opportunities to engage in typical conversational strategies, such as commenting to express agreement and humour, during interactions with UFCPs. They seldom asked clarifying questions when uncertain, for example, "Do you mean…?”, however, this was more frequent during interactions with FCPs than UFCPs. Rather than inviting communication partners to share details; information exchange was upheld through oversharing of personal details, opinions and feelings. Thus, participants with TBI were only partially involved in elements of content and social connectedness across conversations with varying communication partners. Further research with a larger sample may be of value to explore this finding.

The research emphasized that communication partners exhibit many communicative competencies, which contributed to effective interactions for individuals with TBI [31]. Previous research also described that communication partners potentially limit successful participation of individuals with TBI by providing and requesting inadequate information, asking testing questions, questioning the person’s accuracy, and failing to follow up on their contributions

[6,32]. Communication partners are likely to use patronizing comments, flat tone of voice, and slowed the rates of speech production [6,33,34]. In accordance with studies by Togher et al. [18] and Behn et al. [6], interactions with FCPs, such as wives or mothers, represented communication styles, which are detrimental to participants with TBIs' successful communication participation. Thereby communication partners who provided little support in the form of prompts, structure, and positive experiences lead to more confused, inappropriate and negative communicative exchanges. Speech-language therapists need direction regarding aspects of communication partner training that promote and hinder communication participation; with this knowledge, concrete recommendations may be made.

For cognitive rehabilitation therapy to be most effective, treatment must be contextualized to real-life problems [35]. Communication partner training is therefore relevant as it represents a functional and natural task, which may generalize skills to other cognitive domains because of interaction between linguistics and other cognitive systems during interaction with both FCPs and UFCPs. FCPs' moderately high ratings across the Adapted MSC (figure 1) showcased their ability to functionally assist participants with TBIs' participation and maintain the flow of interaction. Upon misdirection by participants with TBI, FCPs approached communicative breakdowns directly. FCPs purposefully maintained the flow of communication-interaction; incorporating functional, supportive strategies such as summarizing, linking topics, referring to cognitive supports, logical organization of information, and collaborative talk. UFCPs displayed a basic degree of support in acknowledging participants with TBI's frustrations.

FCPs further demonstrated a range of conversational cues throughout interactions and implemented implicit linguistic, paralinguistic, and extralinguistic cues to ensure participants

with TBI were provided with opportunities to participate. For example, supportive techniques such as exaggerated body language, and prolonged response time, prompted participants with TBIs' participation. Other studies found important differences in the nature of information exchange and communication style between participants with TBI and FCPs as well as UFCPs [6,21]. The implications of these studies include the need to carefully choose communication partners for each individual and the importance of attending to difficulties that might be encountered. The findings are clinically relevant, affirming the importance of the further establishment of functional communication interventions for the TBI population and their everyday communication partners. The value of communication partner training is restated, as it may alleviate commonly experienced effects of social isolation and may enable social reintegration [24].

Both communication partner groups fostered collaboration wherein information exchange was mostly equally shared between all communication partners. FCPs further facilitated participation through posing questions in a supportive manner; cueing sharing of details and actively involving participants with TBI. UFCPs directed non-productive comments in response to participants' interactions; resorting to an elaborative communicative style when communicative breakdowns occurred. FCPs succeeded in clarifying contributions of participants with TBI; ensuring optimal involvement and fostering both a collaborative and elaborative communication style. Thus, FCPs were not only assisting participants with TBI but also clarifying to enable improved participation and improving the quality of the interaction as a whole. In totality, FCPs rarely assumed the accuracy of participants with TBIs' responses and applied various verification supports more often than UFCPs. Familiarity could, therefore, be an

essential component to successful communication-interaction with FCPs being more skilful and having a greater awareness of difficulties.

Although the results are based on a small sample and measures reflect the raters' impressions of the conversations as a whole, the findings support the significance of communication partners and the environmental influence on the interactions of participants with TBI [22]. Differences in the degree of participation across the Adapted MPC may be attributed to the influence of various contextual factors. Firstly, interactions between FCPs and participants with TBI differed in comparison to those with UFCPs in terms of the topic of discussion, topic interest and familiarity. Participants with TBI were more likely placed in information-giving roles with UFCPs possibly due to discussing more engaging, and familiar topics in comparison to the injury-related discussion with FCPs. Literature shows that discussion of personally relevant and familiar topics facilitates the participation of individuals with TBI [1,15,36]. Participants with TBI contributed personal experiences yet rarely asked related clarifying or follow-up questions. Questions, though scarce, were more readily asked during interactions with FCPs. Thus, participants with TBI competently contributed to maintaining the topic marginally more so with UFCPs, possibly due to the nature of the conversational task and to the existing role of power relations.

Secondly, the role of relationships (i.e. power relations) [1] was clear as participants with TBI may have had more typical conversations with their peers than with other communication partners. Similarities in gender and age may have influenced their communication-interactions [21]. Differences in ratings between interactions with FCPs and UFCPs may be attributed to the role of social distance between participants with TBI and FCPs (i.e. the less the social distance, the higher the familiarity). Proportionally more techniques were utilized by FCPs than UFCPs,

and this may be attributed to the FCPs experience or exposure with interacting with individuals with TBI regularly. Applied techniques took on different forms across different social relationships that were involved in the FCP condition (i.e. mothers' interactions compared to those with the wife, child, and friend/volunteer).

Thirdly, although more forms of support were observed with FCPs, these interactions were directive in nature. Studies involving immediate family (e.g. mothers) further prove that FCPs are more directive in their approach when facilitating interaction with participants with TBI [37]. Aspects of questioning, clarification and verification may have been elicited more frequently during interactions with FCPs.

These findings concur with previous research [6,7,15,21,33] demonstrating communication partner influence on individuals with TBI, and therefore are of clinical value for the communication intervention of individuals with TBI and their everyday communication partners; earlier research suggesting varying communication partners may largely influence the extent of participation in communication for individuals with TBI, echoes these findings [16,34,37].

There is a lack of TBI-specific standardized assessment measures and limited clinical use of communication-interaction assessment methods [38]. Measures of communication assessment and intervention post-TBI remain a challenge in speech-language therapists' practice. This study emphasizes the value of the Adapted MPC and MSC in measuring communication participation and the degree of support provided by communication partners and may assist speech-language therapists in decision-making. Further research regarding the application of communication-interaction evaluation in speech-language therapist practice is warranted.

Findings are consistent with other recent studies examining communication partner influence on communication-interaction [7,15,16]; further contributing to a growing consensus of the significant relationship between communication-interaction skills and communication partners. This research described communication-interaction evaluation measures that may be practical for speech-language therapists to use with adults with mild to moderate TBI; further guiding evidence-based speech-language therapist practice and informing future research.

The scales [18] provided important clinical information for describing a spectrum of facilitative and restrictive behaviours by UFCPs and FCPs during interactions with participants with TBI. Certainly, differences in the specific criteria used to compare the involvement in the communication of participants with TBI and their everyday communication partners could contribute to differences in findings between the present study and that of others. Further robust research is necessary to guide and develop communication partner training that is grounded in evidence-based practice. Findings of the current study suggest that despite communication partner familiarity, there is no significant influence on the degree of participation and the success of interaction as the person with TBI has an existing pervasive communicative deficit.

STUDY LIMITATIONS

Although the findings revealed insights into the interactions of participants with TBI and different communication partners, the results should be interpreted with caution. The sample composition and size were limited, making it difficult to generalize findings to the general population of people with mild-moderate TBI [39**]**. Future research recruiting larger samples with varying severity of TBI is recommended.

Generalizability of the results proved to be difficult concerning the representation of the TBI population within the unique South African context. South Africa consists of a diverse

population, with people from multiple cultural backgrounds, largely varying socioeconomic statuses, and the presence of multiple languages, which often results in the existence of language barriers [40**]**. These results did not consider the general South African population, such as the inclusion of commonly spoken African languages and variation in socioeconomic statuses. Further research is necessary to describe the use of the Adapted Kagan scales in South Africa.

Conversation starter topics varied across communication partner conditions. Consistent conversational starter topics may combat any environmental variations and yield conversational samples for reliable comparisons.

CONCLUSION

Despite the impact that communication-interaction impairments have on an individual with TBI's day-to-day life, to date, few studies have investigated communication-interaction measures and treatments in individuals with TBI [35]. Thus, speech-language therapists are left with scarce scientific-based evidence to guide therapeutic intervention of communication-interaction deficits [35]. There is a major call for TBI research to shift focus into the more robust therapeutic evaluation and intervention measures for individuals with TBI and their everyday communication partners.

As per the authors' knowledge, this was the first study of its kind conducted in South Africa. The findings demonstrated the influence of the quality of communication partner support versus the quality of participation during communication-interaction for participants with TBI. The demand for communication partner training in the rehabilitation of individuals with TBI's cognitive-linguistic impairments is emphasized; acknowledging the important role of the communication partner. This study highlighted the need to include non-therapist communication partners in future studies.

While this study does not offer a conclusive answer to the question of how familiarity impacts communication participation for individuals with TBI, it provides insight into the type and degree of support offered by varying communication partners. The findings are valuable for speech-language therapists and accentuate considerations for the use of standardized and functional measures of communication remediation for people with a cognitive-communication disorder and TBI.

All in all, the research findings pose important questions about the role of communication partner familiarity for successful communication participation for individuals with TBI and overcoming the effects of a cognitive-communication disorder. Further development of training and rating procedures for the Adapted Kagan scales could promote more frequent and reliable use of these communication measures, specifically within the unique and diverse South African context.

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Chapter 4: Implications and conclusion

This chapter provides the clinical and theoretical implications as well as the conclusions of the study. A critical evaluation of the study's strengths and limitations, as well as recommendations for the direction of future research, are discussed.

4.1. Summary of the main findings of the study

Using the Adapted MPC and MSC scales in analysing interactions (Togher et al., 2010), this study aimed to compare the communication-interactions between participants with TBI and FCPs and those between participants with TBI and UFCPs. Comparing the interactions of participants with TBI and FCPs and UFCPs on the Adapted MSC scales showed that there were statistically significant differences between FCPs and UFCPs degree of support on a range of aspects within the 'Acknowledging' and 'Revealing' components of the MSC scale. Findings further demonstrated that FCPs, more so than UFCPs, were more skilled at supporting and enabling participation of participants with TBI; however, this support was not without flaw. The CP support only alleviated the effects of participants with TBIs' underlying CCD to some degree. No statistically significant differences were found between the interactions of individuals with TBI with various CPs. The findings thus emphasised that individuals with TBI still need structured support to functionally participate in communication-interactions. The study further showed that participants with TBI have persisting CCDs, influencing their participation during communication-interactions. The associated underlying effects of a CCD, therefore, hinders communication participation for these individuals despite conversational scaffolding provided by competently trained or experienced CPs (Lê et al., 2011).

Despite no statistically significant differences, the degree of participation displayed by participants with TBI with FCPs in contrast to UFCPs was of clinical value. Although the results are based on a small sample and measures reflect the raters' impressions of the conversations as a whole, the findings support the importance of CPs as well as the environmental influence on the interactions of participants with TBI (Hallgren, 2012). Differences in the degree of participation across the Adapted MPC may also be attributed to the influence of various contextual factors. Firstly, interactions may have differed due to the topic of discussion, topic

interest, and familiarity with the topic. Secondly, the role of relationships i.e. power relations (Mcdonald et al., 2014) was evident as participants with TBI may have had more typical conversations with their peers than with other CPs, for example, mothers. Similarities in gender and age may have influenced their communication-interactions (Tu et al., 2011). Differences in ratings may, therefore, be attributed to the role of social distance between participants with TBI and FCPs (i.e. the less the social distance, the higher the familiarity) (Tu et al., 2011). Findings are consistent with other recent studies examining CP influence on communication-interaction (Bogart et al., 2012; Sim et al., 2013; Togher et al., 2006) further contributing to a growing consensus of the significant relationship between communication-interaction skills and CPs. Further robust research is necessary to guide and develop assessment and intervention paradigms, such as CPT, for individuals with TBI that is grounded in evidence-based practice.

The scales (Togher et al., 2010) provided important clinical information to describe a spectrum of facilitative and restrictive behaviours by UFCPs and FCPs during interactions with participants with TBI; thus, the research question: '*How do the communication-interactions of individuals with mild to moderate TBI with FCPs compare to those communication-interactions with UFCPs*?' could be successfully answered. The initial assumption was not supported, and the most interesting result was that, regardless of CP familiarity, there was no significant difference between individuals with TBIs' interactions with FCPs and UFCPs regarding the degree of participation and success of interaction because of an individual with TBI's existing, pervasive and debilitating CCD (Togher et al., 2014).

4.2. Theoretical implications of the study

The ICF framework as a conceptual model aided in establishing the holistic treatment of persons with TBI through considering and including ECPs as an integral part to the rehabilitation of individuals with TBI (Laxe et al., 2015; Togher, McDonald, Tate, Rietdijk & Power, 2016). There is an increased understanding that CPs have an impact on the participation of individuals with TBI and more research has been geared towards the value of enhancing CPT in the rehabilitation of persons with TBI (Behn et al., 2012; Chia et al., 2019; Togher et al., 2013, 2016;

Tu et al., 2011). CPT is also known to improve healthcare communication between health professionals and people with TBI as well as other neurological conditions such as stroke and dementia (O'Rourke et al., 2018). As a consequence, CPT is recommended as part of evidence-based guidelines from authoritative bodies across the field of TBI (Togher et al., 2014). TBI is a leading cause of death in children and young adults in South Africa, where the rate of mortality from motor vehicle accidents and interpersonal violence are respectively five and four times the global average (Jerome et al., 2017; Parkinson, Kent, Aldous, Oosthuizen & Clarke, 2014). The need for standardised, culturally appropriate and financially viable assessment and intervention measures for SLTs are emphasised for people with TBI in this LMIC. Hence, SLTs and researchers in the TBI health and rehabilitation field should aim to focus on context-specific interventions that can be implemented in more rural and inaccessible settings (Morris et al., 2019; Wegner & Rhoda, 2015). The value of CPT is therefore indicated as a financially viable, context-specific and culturally appropriate approach to communication rehabilitation for individuals with TBI in South Africa.

This research project studied participants with mild to -moderate TBI and emphasised the effects that CCD have on participation during communication-interactions for individuals with TBI. While CCD has been illustrated after moderate to severe TBI in the literature (Hardin & Kelly, 2019), scarce qualitative data exist on mild TBI [mTBI] and broad consensus illustrating CCD following mTBI has not yet been described extensively (Hardin & Kelly, 2019). Often individuals with mTBI are generally over-looked and are undoubtedly the most difficult to identify and describe and, in turn, provide therapeutic intervention for, owing to the subtle but influential nature of their injuries on the communicative activities of daily living (Barwood & Murdoch, 2013). However, through the current study, certain aspects of communication impairments in individuals with mTBI were described; contributing to the small body of research on this population. There is a call for establishing SLT evaluation and treatment measures that account for the subtle nature of this group's communication deficits explicitly. A group of persons who may need specialised and more focused cognitive-communication intervention have, therefore, been emphasised in this study. It may be beneficial to incorporate

this understanding into undergraduate training for SLTs in South Africa so that future SLT assessment and intervention measures can be specialised, standardised and functional; incorporating the unique needs of mTBI.

Additionally, educators should train other rehabilitation professionals, community-based workers and undergraduate SLTs in community-based and context-specific rehabilitation for individuals with mTBI to prepare them for working in these settings with these individuals and their CPs (Morris et al., 2019; Wegner & Rhoda, 2015). It is also necessary to inform and educate families and volunteers regarding basic rehabilitation practices to promote regular rehabilitation activities such as CPT. Internationally, rehabilitation research supports the view that the more frequently and timeously rehabilitation activities are initiated, the improved the outcome (Cheng et al., 2017; Dang, Chen, He & Chen, 2017; Sacco et al., 2016). Thus, families or ECPs who can assist with maintaining regular rehabilitation practice could promote better health outcomes and enable rehabilitation accessibility (Morris et al., 2019). Considering South Africa's diverse context also calls to generate community-based rehabilitation services that are communicable in a mode suitable and sensitive to individuals and their ECPs' cultural and linguistic background/needs (Morris et al., 2019; Wegner & Rhoda, 2015). Interpreters or local community-based volunteers can, therefore, be trained to deliver rehabilitation information and interventions more effectively and more frequently under the supervision of rehabilitation professionals such as an SLT (Wegner & Rhoda, 2015). However, further research is warranted.

4.3. Clinical implications of the study

The WHO recently released "Rehabilitation 2030: a call for action", stating that "a concerted global action towards strengthening rehabilitation and health systems" is necessary to facilitate health and function (WHO, 2017). The WHO document highlights that the provision of accessible and affordable rehabilitation is central to achieving and ensuring healthy lives while promoting well-being for all, at all ages (WHO, 2017). Thus, access to rehabilitation services should be a persistent priority in South Africa as a crucial part of care for those with chronic conditions and less than optimal health, to enable them to reach their full functional potential,

improve their QoL, and ensure economic growth for South Africa as a whole. In the South African context, rehabilitation is currently not viewed in the same light as medical and curative services; and the value is, therefore, understated (Bateman, 2012).

TBI is a multifocal disorder (McKee & Daneshvar, 2015) with many debilitating factors and as such, no clear-cut guideline in the rehabilitation of persons with TBI currently exists (Galgano et al., 2017; Wright, Zeeman, Biezaitis & Federici, 2016). Multidisciplinary team (MDT) care is recommended as the best practice to address the breadth of symptoms post-TBI with a team including medicine, physical therapy, behavioural health, and cognitive therapy, which is most commonly provided by SLTs (Hardin & Kelly, 2019). There is a lack of TBI-specific standardised assessment measures across health care domains and limited use of communication-interaction assessment methods within the SLT clinical scope (Galgano et al., 2017). SLTs are left with scarce scientific-based evidence to guide therapeutic intervention of communication-interaction deficits (Kintz et al., 2018). Findings from this study inform SLTs and other MDT members involved in the management of TBI regarding the value of the Adapted Kagan scales, CPT and the inclusion of CPs (FCP and UFCP); thus, supplementing the MDT's rehabilitation efforts with individuals with TBI. Internationally, best practice rehabilitation is widely accepted, although rehabilitation has not been a priority in South Africa (Morris et al., 2019). It is necessary to identify and acknowledge local barriers in South Africa to evidence implementation of rehabilitation (Wegner & Rhoda, 2015). A well-planned and cost-effective approach needs to be considered to ensure the provision of accessible, functional, affordable and evidence-based rehabilitation (Kong et al., 2017). SLTs, therefore, need to explore the value of including the Adapted Kagan scales, as a baseline of interaction, and CPT programmes further to provide holistic and evidence-based assessment and intervention within an MDT and LMIC setting. Such knowledge can further improve the efficiency of standardised implementation, of the Adapted Kagan scales and CPT in health and rehabilitation services across South Africa, particularly in rural settings, as both the scales and CPT can be considered cost-effective and relatively easy to implement by SLTs (Douglas, 2018; Kong et al., 2017; Morris et al., 2019; Wegner & Rhoda, 2015).

This study emphasised the value of the Adapted MPC and MSC in measuring communication participation and the degree of support provided by CPs. Findings may assist SLTs in merging evidence-based practice with clinical expertise to provide patient-centred/individualised care. The Adapted MSC rating scales differentiated FCPs and UFCPs degree of support provided in the structured interactions with participants with TBI. Both FCPs and UFCPs interaction styles may exert different facilitating and or restrictive behaviours; ultimately impacting the communication participation of participants with TBIs. Data furthermore adds to literature demonstrating the value of the use of the adapted form of the MSC and MPC scales (Behn et al., 2012; Eriksson et al., 2014; Eriksson, Hartelius & Saldert, 2016; Saldert, Backman & Hartelius, 2013; Togher et al., 2010; Tu et al., 2011). This research described communication-interaction evaluation measures that may be practical for SLTs to incorporate with adults with mild to moderate TBI in a variety of settings; furthermore, guiding evidence-based SLT practice in an LMIC such as South Africa.

Although not statistically significant, positive and debilitating effects of communication participation were underlined and may, therefore, influence the effectiveness of rehabilitation efforts for individuals with TBI and their ECPs post-injury. This study, therefore, guides future rehabilitation endeavours for SLTs regarding targeting aspects of social and cognitive-communication fallouts that may be typical to individuals with mTBI. Although there are no published works that specifically evaluate social-cognition in adults with mild TBI, deficits in cognitive sequelae; including reduced processing speed, concentration, attention and memory and salient language impairments in writing function and execution are commonly reported in individuals with mTBI (Barwood & Murdoch, 2013; Kimbarow, 2019). Literature reports overall changes in social participation, social success and increased isolation in individuals with mTBI (Kimbarow, 2019; Snell, Martin, Surgenor, Siegert & Hay-Smith, 2017). Communication-interaction difficulties and strengths observed in the study can generate more in-depth research exploring the communication outcomes for individuals with mTBI more specifically and provide more conclusive results.

Ylvisaker et al. (1998; 2003) have argued that clinical intervention should move away from the traditional approach of assessing and treating individuals in isolation and rather incorporate the use of contextualized approaches (Gordon & Duff, 2016; Togher, 2013; Ylvisaker & Feeney, 1998; Ylvisaker, Hanks & Johnson-Green, 2003). Contextualized clinical approaches are set in everyday activities where the engagement of multiple cognitive domains and focus on the interactions among CPs in complex social settings are necessary (Ylvisaker, Turkstra & Coelho, 2005). These authors further established that assessment of communication problems post brain injury requires consideration of language functioning, cognition and executive skills within the context of the individual with TBI, their ECPs (e.g., family members), their future goals and their expectations of the rehabilitation outcomes (Togher, 2013). Ylvisaker's "every-day, positive, routines" is an example of such a contextualized approach that incorporates ECPs (e.g. family, peers, clinicians), in the lives of the individual with TBI, to create successful communicative and behavioural routines in the contexts of their everyday lives (e.g. home, work, school) (Gordon & Duff, 2016; Ylvisaker & Feeney, 1998).

Ylvisaker's approach focuses on how to train and teach ECPs to engage in positive, engaging and rewarding conversations (Ylvisaker & Feeney, 1998). As in the ICF model, there is a clear focus on providing intervention within functional and salient contexts that are relevant to the individual's everyday life, modification of the environment to facilitate the success of the individual (e.g., reducing distractions, increasing familiarity), and modification of expectations and support from the people (e.g., family, co-workers, peers) in the individual's everyday life (e.g., training, problem-solving, routines) (Ylvisaker et al., 2003). By targeting factors like social interaction and communication, that are personally meaningful to the individual, through positive everyday routines that are set in contexts highly relevant to the individual, the greater the likelihood of both skill acquisition and transfer to real-world settings (Gordon & Duff, 2016). Within these positive routines, skills, strategies, and behaviours are taught through collaboration, apprenticeship, and scaffolding, rather than through explicit instruction (Gordon & Duff, 2016; L. Togher, 2013).

Moreover, the involvement of ECPs as collaborators during the assessment and intervention of communication is critical to the success of rehabilitation for people with TBI (Ylvisaker, Feeney, & Urbanczyk, 1993). Training CPs is described as an efficient training tool, increasing the likelihood that the ECP will have the skills to creatively and effectively modify interventions and supports as new issues arise in the future (Gordon & Duff, 2016). Thus, including CPs increases the number and variety of natural learning trials for the individual with TBI, facilitating the more rapid acquisition of positive communication alternatives and more efficient generalisation (Gordon & Duff, 2016; Ylvisaker & Feeney, 1998). Therefore, Ylvisaker's collaborative approach to intervention (Ylvisaker & Feeney, 1998) paved the way for the development of assessment and remediation measures, such as the Adapted Kagan scales and CPT programmes, for individuals with TBI (Togher, 2013). Further accentuating the value of CPs and context in the communication remediation of individuals with TBI.

Given social communication deficits in TBI can be subtle and even more so in mTBI, more research, protocols and forms of assessment and intervention are required to understand how communication participation can differ in varying contexts with varying CPs (Gordon & Duff, 2016). The findings from this study provide further evidence supporting the use of Ylvisaker's social, interactive, and collaborative approach for individuals with TBI and implementing the standardised use of the Adapted Kagan scales in assessment and remediation of communication-interactions for individuals with TBI. The Adapted Kagan scales may, therefore, be a fruitful way to implement Ylvisaker's contextualized intervention approach in more clinical and research-based settings (Ylvisaker & Feeney, 1998). Standardised use of the scales promises to offer a deeper understanding of the impact of CCDs with varying CP interactions; allowing for the integration of empirical findings with theoretical models. Such work would also promote integration between research paradigms and current clinical practice.

4.4. Critical evaluation of the study

4.4.1. Strengths of the study

- Strict inclusion and exclusion criteria enhanced the reliability of the study's findings. Participants with additional or associated neurological language deficits, e.g. the presence of aphasia, the presence of psychiatric diagnoses, other acquired or non-traumatic brain injury, or degenerative neurological conditions such as dementia were excluded from the study. These additional language difficulties would have been a confounding factor, preventing the accurate comparison of communication-interaction of persons diagnosed with TBI.
- Participants in the two groups were matched according to their language proficiency to limit second language influence and the effect of bilingualism. Bilingualism or the use of more than one language in conversational discourse may affect brain injury outcomes, including overall effectiveness of communication (Rich, 2016). Bilingualism may hinder the actual comparison of aspects of social-communication that may be flawed as aspects of language proficiency may influence the outcome of communication participation.
- The second rater scored 25% (n=4) of the sample separately from the researcher. Inter-rater reliability was found to be excellent. Excellent inter-rater reliability illustrates the strength of the Adapted Kagan scales as the percentage agreement was consistently high, further highlighting the accuracy and validity of the results obtained from the video samples using the scales.
- The Adapted Kagan scales is a published tool specifically designed for persons with TBI, and thus, the scales are appropriate, valid and reliable outcome measures to implement (Mcdonald et al., 2014). The *Adapted* Kagan scales were developed and validated against the Kagan scales (Kagan et al., 2001, 2004). The specificity of the scales shows its ability to accurately identify and describe communication-interactions of individuals with TBI and ECPs further emphasising the validity and reliability of the Adapted Kagan scales.

- This study contributes to the small body of available mild-to-moderate TBI research, as communication deficits post moderate-severe TBI are more frequently described (Hardin & Kelly, 2019). Further, more robust research regarding communication outcomes for individuals with mild-to-moderate TBI needs to be generated for the development of standardised rehabilitation efforts to take place.

4.4.2. Limitations of the study

- Due to a constricted time frame for data collection, the sample size was small, and therefore findings cannot be translated to the general population of people with mild-moderate TBI (Button et al., 2013). Findings, however, are valuable as they contribute to the small body of available mTBI literature.
- Inclusion criteria did not consider the diversity of the general South African population. The representation of the TBI population within the South African context is, therefore, not a true reflection of the existing South African demographics. South Africa consists of a diverse population, with people from multiple cultural backgrounds, widely varying socioeconomic statuses, and the presence of multiple languages, which often results in the existence of language barriers (Van der Berg, 2016). These results did not consider the inclusion of commonly spoken African languages and variation in socioeconomic statuses as the role of bilingualism may have influenced the exact comparison of communication-interaction of individuals with TBI. It is recommended that future research endeavours explore contextualising the scales to suit the South African setting; considering a variety of socioeconomic backgrounds and languages.

- Conversation starter topics varied across CP conditions affecting the consistency of interaction samples obtained. Individuals with TBI produce more coherent and cohesive discourse when discussing relevant and interesting topics (Togher & Hand, 1999). Thus, consistent conversational starter topics may combat any environmental variations and yield conversational samples for more reliable comparisons.

4.5. Recommendations for future research

- Due to the heterogeneity of people with TBI and their vast array of short- and long-term recovery patterns (Scholten et al., 2015), accurate measurement of communication participation and the impact of all severities of TBI over time are needed. Future research recruiting a larger sample with varying severity types of TBI is recommended to confirm/support the findings of the present study. A more substantial and more diverse sample may also affect the generalisability of the findings to the TBI population at large.
- The Adapted Kagan scales is a unique tool that can be beneficial for SLTs working in rural settings as it is a cost-effective and functional approach; allowing for observation of interactions in natural settings with ECPs. In sub-Saharan Africa the incidence of TBI is 150 - 170/100 000 compared to the global average of 106/100 000 (Jerome et al., 2017; Parkinson et al., 2014). Further research is, therefore, necessary to describe the use of the Adapted Kagan scales in South Africa. More robust research regarding the application of communication-interaction evaluation in SLT practice is also warranted with more insight needed in the assessment and intervention outcomes of communication participation following TBI as a potential addition to established CPT programmes.

- This study accentuated the critical need to include non-therapist CPs in future studies. McDonald et al. (2014) state that if CPs are in a therapist-client relationship, the roles they assume during communication are predetermined and relatively different from other relationships, the person with TBI may have. As therapist-client interactions are not representative of every-day life interactions; it is crucial to include the individual with TBI's every-day context into consideration when implementing rehabilitation efforts. Measuring and describing social and cognitive-communication fallouts that may occur in every-day contexts will entail excluding therapists who are aware of the structure and support types that an individual with a CCD and TBI may need.

- Current TBI practice guidelines are only just beginning to realise the relevance of contextualised intervention and the importance of inclusion of CPT in the rehabilitation

of individuals with TBI. CPT education should be expanded into other public sector domains (e.g. police officers) or other health care professionals (e.g. members of the MDT) to facilitate improved communication-interaction outcomes for individuals with TBI and their ECPs in all daily settings of life and in-turn fostering improved QoL.

4.6. Conclusion

Findings demonstrated the influence of the quality of CP support versus the quality of participation during communication-interaction for participants with TBI. Earlier research suggesting varying CPs may largely influence the extent of participation in communication for individuals with TBI echoes these findings (Chia et al., 2019; Togher et al., 1997; Togher et al., 2006; Wiltshire & Ehrlich, 2014). While this study does not offer a conclusive answer to the question of how familiarity impacts communication participation for individuals with TBI, it provides insight into the type and degree of support offered by varying CPs. Further research by SLTs is crucial to describe the effects of familiarity on communication-interaction more purposefully. The findings of this study may be valuable for SLTs and underline considerations for the use of functional, standardised measures of communication rehabilitation for people with CCD and TBI. To the researcher's knowledge, this was the first study of its kind conducted in South Africa and no known studies within this setting could be found comparing the interactions of FCPs and UFCPs with individuals with TBI specifically.

Globally, TBI is a significant cause of both morbidity and mortality (Kong et al., 2017), with incidence counts in Sub-Saharan Africa being much higher compared with the global average (Jerome et al., 2017). Scarce information on TBI in Africa exists and authors report, to date, no population-based studies in Africa dedicated to TBI currently exist (Wong, Linn, Shinohara, & Mateen, 2016). Multicultural and multilingual LMICs, like South Africa, need SLTs to generate evidence-based practice, based on evidence-practice gaps, including context representative samples, and not only incorporate research findings from international or high-income countries. Dedicated efforts to reduce the severity of post-TBI social and cognitive-communication deficits are urgently required to guide future research and inform all necessary

health professionals and clinical measures and minimise the debilitating effects of CCD post-TBI. However, the physical and financial means to manage the burden of TBI are inadequate; resulting in under-identification of communication deficits, infrequent referrals, and inadequate rehabilitation service delivery.

Despite the impact that communication-interaction impairments have on an individual with TBI's day-to-day life, to date, few studies have investigated communication-interaction measures and treatments in individuals with TBI and their ECPs (Kintz et al., 2018). All in all, the research findings pose essential questions about the role of CP familiarity for successful communication participation for individuals with TBI and overcoming the effects of CCD. The demand for CPT in the rehabilitation of individuals with TBI's cognitive-linguistic impairments is emphasised; acknowledging the critical role of the CP. There is a significant call for TBI research to shift focus into the more robust therapeutic evaluation and intervention measures for individuals with TBI and their ECPs. Further development of training and rating procedures for the Adapted Kagan scales could promote more frequent and reliable use of these communication measures, specifically within the unique and diverse South African context.

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Appendices

APPENDIX A: Letter granting permission from rehabilitation sites

APPENDIX B: Ethical clearance letter from the Faculty of Humanities Research Ethics Committee

APPENDIX C: Participant information leaflet & informed consent form

APPENDIX D: Adapted Kagan (MSC and MPC) scales, Togher et al. (2010)

APPENDIX E: Data collection sheet

APPENDIX F: Article submission confirmation

Appendix A: Letter granting permission from rehabilitation sites

Letter to Brainlife:

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

16 March 2018

Dear Speech-Language Therapist(s) at Brainlife Centre, Pretoria

RE: Request for permission to recruit adult clients with traumatic brain injury from your rehabilitation facility for research

I, Suné van der Bergh, am a Master's degree student from the Department of Speech-Language Pathology and Audiology at the University of Pretoria. I have chosen to conduct my research for my Master's degree in the field of Traumatic Brain Injury (TBI). The research study is titled "*Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury.*" My research study entails the observation of communication of individuals with TBI between familiar and unfamiliar communication partners and documenting these observed differences in communication. The research will, therefore, lead to a comparative study, investigating the variations in communication between six to eight individuals with TBI and familiar and unfamiliar communication partners.

The informed consent form consists of two parts:

- Information Sheet (to share information about the research with you).
- Certificate of Consent (for you to sign if you agree to give me permission to recruit clients from your facility).

PART 1: INFORMATION SHEET

I, therefore, wish to request permission to recruit clients from your facility. Clients that are eligible for the study include:

- Clients that have a confirmed diagnosis of TBI (at least 6 to 12 months post-injury).
- The client must be an adult between the ages of 18-59 years of age; thereby excluding individuals with paediatric TBI as well as the effects of aging on cognition.
- The client should be diagnosed with only one incident of TBI, confirmed by medical reports of either computerized tomography *(CT)* scans or Magnetic resonance imaging *(MRI)* scans.
- The client must be proficient in English and/or Afrikaans.
- The client must pass a hearing screening to rule out the effects of hearing loss.

Clients that agree to participate in the study will be required to participate in:

- A minimum of two contact sessions occurring on different days:

1. The first session consists of measuring participant suitability for the study, which is determined by the use of validated tools:
   - I will be using standardized tests commonly used with adults that have neurological impairments - SCATBI (Adamovich & Henderson, 1992) and Pragmatic Protocol (Prutting & Kirchner, 1987).
   - A hearing screening will also be conducted in order to rule out the effects of a hearing loss.

2. The second session the participant will be expected to communicate with a familiar and then an unfamiliar communication partner for a period of ten to fifteen minutes each. Conversation starters will be used and the participant with TBI and the communication partner will engage in one of three jointly constructed discourse tasks after instructions from the researcher. Conversation starters, based on the work of Togher et al. (2010) in the article titled: Measuring the interactions of people with traumatic brain injury and their communication partners: the adapted Kagan scales, will be implemented. This communication will be video recorded for data collection purposes.
   - The second session is expected to last for an hour, as there will be breaks in between the sessions.

Your assistance in regard to this matter would be greatly appreciated.

Please feel free to contact me should you have any further queries:
083 784 0194
sunevdbergh@hotmail.com

Yours Sincerely,

Ms Suné van der Bergh
Researcher

Mrs Bhavani Pillay
Supervisor

Mrs Esedra Krüger
Supervisor

Dr J. van der Linde
Head of Department: Speech-Language Pathology and Audiology

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

PART 2: CERTIFICATE OF CONSENT

PERMISSION FOR USE OF INFORMATION OF ADULT INDIVIDUALS WITH TRAUMATIC BRAIN INJURY

Herewith I, Cindy Holtzhausen give permission to Suné van der Bergh to approach and recruit clients from BrainLife for the purposes of data collection for the research project titled: *"Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury."* I have received the necessary information about this study and I have had the opportunity to ask questions regarding this project.

Signature: _____ **Date:** 31/01/2018

BRAINLIFE
Supporting people with brain injuries
BRAINLIFE
171-162 NPO
PBO: 9300541466
brainlife.tshwane@gmail.com
513 Rossouw Street, Willows, Gauteng, 0184

Fakulteit Geesteswetenskappe
Departement Spraak-Taalpatologie en Oudiologie
Lefapha la Bomotho
Kgoro ya Phatholotši ya Polelo-Maleme le Go kwa

Letter to Medstep:

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

16 March 2018

Dear Speech-Language Therapist(s) at Eugene Marais Hospital, Medstep, Pretoria

RE: Request for permission to recruit adult clients with traumatic brain injury from your rehabilitation facility for research

I, Suné van der Bergh, am a Master's degree student from the Department of Speech-Language Pathology and Audiology at the University of Pretoria. I have chosen to conduct my research for my Master's degree in the field of Traumatic Brain Injury (TBI). The research study is titled "*Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury.*" My research study entails the observation of communication of individuals with TBI between familiar and unfamiliar communication partners and documenting these observed differences in communication. The research will, therefore, lead to a comparative study, investigating the variations in communication between six to eight individuals with TBI and familiar and unfamiliar communication partners.

The informed consent form consists of two parts:

- Information Sheet (to share information about the research with you).
- Certificate of Consent (for you to sign if you agree to give me permission to recruit clients from your facility).

PART 1: INFORMATION SHEET

I, therefore, wish to request permission to recruit clients from your facility. Clients that are eligible for the study include:

- Clients that have a confirmed diagnosis of TBI (at least 6 to 12 months post-injury).
- The client must be an adult between the ages of 18-59 years of age; thereby excluding individuals with paediatric TBI as well as the effects of aging on cognition.
- The client should be diagnosed with only one incident of TBI, confirmed by medical reports of either computerized tomography *(CT)* scans or Magnetic resonance imaging *(MRI)* scans.
- The client must be proficient in English and/or Afrikaans.
- The client must pass a hearing screening to rule out the effects of hearing loss.

Clients that agree to participate in the study will be required to participate in:

- A minimum of two contact sessions occurring across different days:

1. The first session consists of measuring participant suitability for the study, which is determined by the use of validated tools:
   - I will be using standardized tests commonly used with adults that have neurological impairments - SCATBI (Adamovich & Henderson, 1992) and Pragmatic Protocol (Prutting & Kirchner, 1987).
   - A hearing screening will also be conducted in order to rule out the effects of a hearing loss.

2. The second session the participant will be expected to communicate with a familiar and then an unfamiliar communication partner for a period of ten to fifteen minutes each. Conversation starters will be used and the participant with TBI and the communication partner will engage in one of three jointly constructed discourse tasks after instructions from the researcher. Conversation starters, based on the work of Togher et al. (2010) in the article titled: Measuring the interactions of people with traumatic brain injury and their communication partners: the adapted Kagan scales, will be implemented. This communication will be video recorded for data collection purposes.
   - The second session is expected to last for an hour, as there will be breaks in between the sessions.

Your assistance in regard to this matter would be greatly appreciated.

Please feel free to contact me should you have any further queries:
083 784 0194
sunevdbergh@hotmail.com

Yours Sincerely,

Ms Suné van der Bergh
Researcher

Mrs Bhavani Pillay
Supervisor

Mrs Esedra Krüger
Supervisor

Dr J. van der Linde
Head of Department: Speech-Language Pathology and Audiology

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YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

PART 2: CERTIFICATE OF CONSENT

PERMISSION FOR USE OF INFORMATION OF ADULT INDIVIDUALS WITH TRAUMATIC BRAIN INJURY

Herewith I, Leanie Engelbrecht give permission to Suné van der Bergh to approach and recruit clients from MedStep for the purposes of data collection for the research project titled: "*Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury.*" I have received the necessary information about this study and I have had the opportunity to ask questions regarding this project.

Signature:  **Date:** 15/03/18

Appendix B: Ethical clearance letter from the Faculty of Humanities Research Ethics Committee

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Research Ethics Committee

10 April 2018

Dear Ms van der Bergh

Project:	**Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury (TBI)**
Researcher:	**S van der Bergh**
Supervisor:	**Ms E Kruger and SB Pillay**
Department:	**Speech-Language Pathology and Audiology**
Reference number:	**14155797(GW20180115HS)**

Thank you for your response to the Committee's correspondence of 26 February 2018.

I have pleasure in informing you that the Research Ethics Committee formally **approved** the above study at an *ad hoc* meeting held on 9 April 2018. Data collection may therefore commence.

Please note that this approval is based on the assumption that the research will be carried out along the lines laid out in the proposal. Should your actual research depart significantly from the proposed research, it will be necessary to apply for a new research approval and ethical clearance.

We wish you success with the project.

Sincerely

Prof Maxi Schoeman
Deputy Dean: Postgraduate and Research Ethics
Faculty of Humanities
UNIVERSITY OF PRETORIA
e-mail: tracey.andrew@up.ac.za

cc: Ms E Kruger and Ms SB Pillay (Supervisors)
Dr J van der Linde (HoD)

Appendix C: Participant information leaflet and informed consent form

Letter to the individual with TBI's significant other/caregiver:

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

Informed Consent Form

Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury

Dear Partner or Family Member of the Prospective Participant,

I, Suné van der Bergh, am a Master's degree student from the Department of Speech-Language Pathology and Audiology at the University of Pretoria. I would like your partner or family member to take part in a research study titled "Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury".

.

The informed consent form consists of two parts:

- Information Sheet (to share information about the research with you).
- Certificate of Consent (for signatures if your partner or family member agrees to take part).

Yours sincerely,
Suné van der Bergh

Ms Suné van der Bergh
Researcher

Tel: 0837840194
Email: sunevdbergh@hotmail.com

Mrs Bhavani Pillay
Supervisor

Mrs Esedra Krüger
Supervisor

Dr J. van der Linde
Head of Department: Speech-Language Pathology and Audiology

Fakulteit Geesteswetenskappe
Departement Spraak-Taalpatologie en Oudiologie
Lefapha la Bomotho
Kgoro ya Phatholotši ya Polelo-Maleme le Go kwa

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

PART 1: INFORMATION SHEET

Study Title: Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury

Principal Investigator: Ms Suné van der Bergh
Degree: Masters in Speech-Language Pathology
Institution: University of Pretoria
Contact number: 083 784 0194

Dear Partner or Family Member of the Prospective Participant

1. Introduction

Your partner/family member is invited to participate in a research study. This information leaflet is to help you and your partner/family member decide if you would like to participate. Before your partner/family member agrees to take part in this study, you should fully understand what is involved. If you have any further questions, do not hesitate to ask the researcher. You and your partner/family member should not agree to take part unless you are satisfied with all the procedures involved in the process of the research.

2. Nature and purpose of the study

The aim of the study is to observe your partner/family member's communication between communication partners, both familiar and unfamiliar to them, and to note the differences in these communicative situations by comparing the events. By conducting this research we hope to gain a better understanding of what individuals with Traumatic Brain Injuries' communication entails. There is a gap in this field of knowledge regarding communication with individuals with Traumatic Brain Injury (TBI). Therefore, participation in this study will assist in the improved understanding of the communication of individuals with TBI.

3. Explanation of procedures to be followed

- This study consists of a minimum of two contact sessions:
    1. The first session will involve a measure of your partner's/family member's suitability for the study. I will first assess your partner/family member using standard tests which are used in assessing cognitive impairments associated with traumatic brain injury in adults. Your partner/family member will also undergo a hearing screening in order to establish hearing status and rule out the effects of hearing loss.
        - This session is expected to last for 1 ½ - 2 hours.
        - This will take place either at the current rehabilitation facility your partner/family member attends or at the Department of Speech-Language Pathology and Audiology (University of Pretoria).
    2. The second contact session will last for an estimate of thirty minutes to a maximum of an hour. In this session, your partner's/family member's communication will be video recorded for data collection purposes. There will be two separate video recordings, each consisting of about ten to fifteen minutes communication with a familiar communication partner (e.g. you or a person that the participant is familiar with). The second recording will take place with an unfamiliar communication partner (i.e. a person unknown to your partner/family member).

- The second session will take place at the rehabilitation facility your partner/family-member currently attends or at the Department of Speech-Language Pathology and Audiology.

A tool will be used after the contact sessions to assess your partner's/family member's communicative behaviours present on the video recordings.

4. What are the possible benefits of the study?

No compensation is offered for participation in this study. There is also no risk of harm or other disadvantages when participating in this study. Participation will contribute to the improved understanding of the communication of individuals with TBI. This increased knowledge may further lead to the development of future assessment and treatment services, specifically regarding communication partner training.

5. What are you and your partner's rights if you take part?

Your partner/family member does not have to take part in this study. You and your partner/family member decide if he/she wants to participate or not. You and your partner/family member can stop participating at any point during the study without giving any reason for doing so. After participation in the study, the results of this study will be explained to you and your partner/family member.

6. Information

If you have any questions concerning this study, you may contact:

Ms. Suné van der Bergh: **083 784 0194/ sunevdbergh@hotmail.com**

Mrs. Bhavani Pillay: bhavani.pillay@up.ac.za

Mrs. Esedra Krüger: esedra.kruger@up.ac.za

7. Confidentiality

All information gathered from this study will be kept confidential. The University of Pretoria's policy with regard to data storage states that results of this study will be stored at the Department of Speech-Language Pathology and Audiology for 15 years. The data will be locked away and stored on a password-protected computer. A hard copy of the data will also be filed and locked away. A percentage of the data will be shared with another professional for purposes of establishing reliability. Moreover, data could be made available for future researchers. Data will also be made available in a research report and may be reported in scientific journals, but will not identify you or your partner as participants in this study.

Thank you for taking the time to read this information sheet

Please feel free to contact me with regard to any questions or uncertainties:

Suné van der Bergh
***Tel:* 083 784 0194**
***E-mail*: sunevdbergh@hotmail.com**

Please indicate whether you want to participate or not in the *Certificate of Consent* form attached.

PART 2: CERTIFICATE OF CONSENT

PERMISSION FOR ADULT INDIVIDUAL WITH TBI TO TAKE PART IN RESEARCH STUDY

1. I agree with my partner or family member to take part in the above-mentioned research project.

   YES ☐

   NO ☐

ONLY TICK QUESTIONS 2-9 IF YOU ANSWERED YES IN QUESTION 1

2. I confirm that I have read and understood the form entitled *Information Sheet* for the above research study. Any questions or concerns about the study have been addressed and dealt with adequately ☐
3. I understand that my partner's/family member's participation in the research is entirely voluntary. I acknowledge the fact that my partner/family member is allowed to withdraw from the research at any time and that this decision will not be held against me or my partner/family member in any way. ☐
4. I understand that my partner/family member will have to attend a minimum of two contact sessions for assessment and data collection if my partner/family member chooses to participate in this study ☐
5. I understand that my partner/family member will be video recorded for the duration of the data collection process of this research study if my partner/family member chooses to participate in this study. ☐
6. I understand that the researcher will not identify me or my partner/family member by name in any reports and that all information about me and my partner/family member will be kept confidential. ☐
7. I understand that there are no financial benefits involved with participating in the study. ☐
8. I understand all my partner's/ family member's rights as a research participant. ☐
9. I know whom to contact about any concerns regarding the research project. ☐
10. I understand that data collected in this study may be used for future research purposes. ☐
11. I would like to receive a summary and feedback of the results of the research project, once completed.

    YES ☐

    NO ☐

_____	_____	_____
Print your Name	Signature	Date
_____	_____	_____
Name of person taking consent	**Signature**	**Date**

Individual with TBI information leaflet and informed consent form:

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

Informed Consent Form

Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury

Dear Prospective Participant,
I, Suné van der Bergh, am a Master's degree student from the Department of Speech-Language Pathology and Audiology at the University of Pretoria. I would like you to take part in a research study.

The informed consent form consists of two parts:

- Information Sheet (to share information about the research with you).
- Certificate of Consent (for your signature if you agree to take part).

Yours sincerely,
Suné van der Bergh

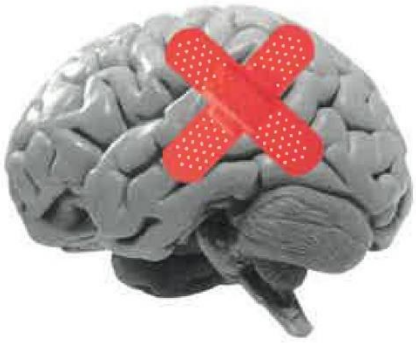
Ms. Suné van der Bergh
Researcher
Tel: 0837840194
Email: sunevdbergh@hotmail.com

Mrs Bhavani Pillay
Supervisor

Mrs Esedra Krüger
Supervisor

Dr J. van der Linde
Head of Department: Speech-Language Pathology and Audiology

PART 1: INFORMATION SHEET

Do you have a **brain injury**?  **YES?**	We need your help with our **RESEARCH** Because research helps us to learn new things. **We need to know how to help people with brain injuries.** **Research about how you talk to:** 1. People you **know** AND 2. People you **don't know**
You may have **problems** with... **memory**   **movement**  **how you think & feel**	This will affect how you **COMMUNICATE** with others. **Communication** involves **thinking** and **social skills.** **Brain injury** impairs these skills and it affects the ability to **communicate WITH OTHER PEOPLE successfully.**

Why this research?

Research can help **test new** ways of giving therapy.

You will **HELP**

1. Therapists to better **understand** how to **HELP other people** with brain injuries,
2. Other researchers and
3. **People with brain injuries' FAMILIES**

Where will the research happen?

The research will be at your REHAB centre:

Muelmed Mediclinic
Rehab Centre

Brainlife

Eugene Marais **Medstep Rehab** Centre

The research is run from the **University of Pretoria.**

3

HOW will it work?

1 → 2 hours

This study consists of 2 contact sessions

FIRST:

1. There will be some **TESTS**

- this will help us to **understand** how your **BRAIN INJURY** has **affected you**
- **AND** if then we can ask you to **participate** in the study.
- It will take 1 to 2 hours of your time.
- You will be **asked** some **questions** and **showed some pictures.**

- We will also test your **hearing**

4

someone you know

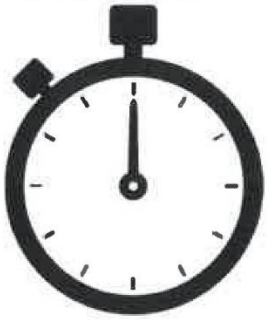
someone you DO NOT know

SECOND:

2. You will talk to **2 different** people
   - You will **talk** with someone **you know**.
   - For example a **friend** or a **family member**
   - We will use a **video camera** to record you talking with this person for **10-15 minutes**.

NEXT

- You will **talk** with someone **you do not know**.
- For example a **stranger**.
- We will use a **video camera** to record you talking with this person for **10-15 minutes**.



30 min → 1 hour

In **total,** both conversations with other people will take you **30 minutes** to a maximum of **1 hour.**

We take video recordings:

Only the **researchers will see these recordings.**

Video recordings **help** us to **remember** what **you did** and **said.**

Video recordings **help** us to **measure your communication.**

AFTER the video recordings:

The **researcher looks** at the **results.**

We can **learn** about **communication** with **people with brain injuries.**

WHAT will you have to do?

In this research you will:

1. Do 1 **test**
2. **Answer** some **questions** and **look** at some **pictures**
3. Have your **hearing** checked

7

4. **TALK** with someone **you know** while being **video recorded.**

5. **TALK** with someone **you do not know** while being **video recorded.**

The VIDEOS we take:

Videos will be **safe** and **protected.**

The videos are stored in a **locked room** and on a **password-protected computer.**

Only the **researchers** will **see** the **videos.**

8

Will you get paid?

You **will not** get paid for taking part in this research

How long will it take?

The total time of doing the research is over 2 different DAYS:

- **1-2 hours** doing a **test ON THE FIRST DAY**
- **1 hour talking** to 2 different people on the second day

9

QUESTIONS YOU MAY HAVE:

Do I have to take part?

You decide
It is **YOUR choice**

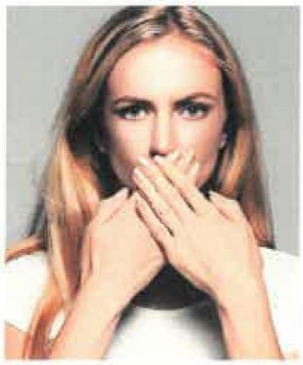
You DO NOT have to take part if you don't want to

Take your time

Read all the **information again**

Talk to your family about taking part

10



You can **STOP** at **any time**

You **do not have to say why** or give a reason

Who will see the research information?

We will keep the **information** about you **safe.**

Only the **researchers** will see the **information about you.**

11

Your information might be **shared with other researchers** in **South Africa** and **researchers** in **other countries.**

This will **HELP other research about brain injuries.**

We will **take out** any **personal details** and **your name.**

What good things will come from taking part?

You will **help** us **learn more** about **brain injury communication.**

So we can **teach families and friends** to better **talk to people with brain injuries.**

You will **help other people with brain injuries** to **take part in more conversations.**

What might be difficult about taking part?

It is **not dangerous** to take part and you **will not get hurt.**
BUT
You **need to talk** to a completely **new person** and it may make you **feel uncomfortable.**

It will **take up** some of **your time.**

You may **get tired** when doing the test.

What happens after the research?

The **researcher looks** at the **videos** and the **results.**

We will **learn** more about the communication with people with brain injuries and other people.

What will happen with the results?

The research results will be **shared:**

With **other researchers**

At **conferences** and **meetings**

14

In **academic journals, magazines,** and **newsletters.**

The **results** will **not use** your **personal details** or your **name.**

Results will include **WHAT** you did **but not WHO** did it.

15

Now you know WHAT the research is about... WHAT is next?

You DECIDE

Do you want to take part?

You have to **decide.**

If you want **more information**
you can **contact me** on
083 784 0194

If you want to **let us know** that you **want to take part**

you can **contact me** on
083 784 0194

16

If you decide to take part

You will need to **sign a consent form**

This form says that **you understand the research** and **you agree to take part.**

If you **decide YES**, you will **get an appointment.**

This **appointment** will be **in March or April.**

Adapted from (BrainLine, 2017), (Headway, 2017) and based on (Johnson-Greene, Informed consent issues in traumatic brain injury research: Current status of capacity assessment and recommendations for safeguards, 2010).

PART 2: CONSENT FORM

Taking part in the research about talking to people you know and do not know to help us develop better therapy techniques for people with TBI and their families.

when you give your answer:

Please mark a tick for YES 

OR a cross for NO 

PERMISSION FOR ADULT INDIVIDUAL WITH TBI TO TAKE PART IN RESEARCH STUDY

1. I **agree** to take part in the research study 

ONLY MARK QUESTIONS 2-13 IF YOU ANSWERED YES IN QUESTION 1

2. I have **read** and **understood** the ***Information Sheet*** for the research study. 

3. I have had the **chance** to **ask questions** and I am happy with the answers to my questions. 

4. I **understand** that **my participation** in the research is **my choice**. 

5. I **know** that I am **allowed to leave** the **research at any time** and I **don't** have to **give a reason** for leaving.
   - **This decision will not** be **held against me** in any way. 

6. I **understand** that I will **have to come to at least two contact sessions** for assessment and will **talk to others** if I choose to participate in this study. 

7. I **understand** that I will be **video recorded** when I **talk to other people in the study** if I choose to participate. 

8. I understand that the researcher will not put my name in any reports and that all information about me will be kept safe and not shared with anyone outside the research. 

9. I understand that the information being collected can be used for research in the future. 

10. I understand that there is no money involved with participating in the study. 

11. I understand my rights as a research participant. 

12. I know who to contact if I have any questions about the research project. 

13. I would like to get information of the results of the research study when it is done. 

If you agree to take part in the research:

Name	Signature / Initial	Date

Name of person taking consent	Signature	Date

FCP information leaflet and informed consent form:

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

Informed Consent Form

Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury

Dear Prospective Participant,
I, Suné van der Bergh, am a Master's degree student from the Department of Speech-Language Pathology and Audiology at the University of Pretoria. I would like you to take part in a research study titled "Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury".

The informed consent form consists of two parts:

- Information Sheet (to share information about the research with you).
- Certificate of Consent (for your signature should you agree to take part).

Yours sincerely,
Suné van der Bergh

Ms Suné van der Bergh
Researcher
Tel: 0837840194
Email: sunevdbergh@hotmail.com

Mrs Bhavani Pillay
Supervisor

Mrs Esedra Krüger
Supervisor

Dr J. van der Linde
Head of Department: Speech-Language Pathology and Audiology

PART 1: INFORMATION SHEET

Study Title: Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury

Principal Investigator: Ms Suné van der Bergh
Degree: Masters in Speech-Language Pathology
Institution: University of Pretoria
Contact number: 083 784 0194

Dear Prospective Participant

1. Introduction

You are invited to participate in a research study titled "Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury". This information leaflet is to help you decide if you would like to participate. Before you agree to take part in this study, you should fully understand what is involved. If you have any further questions, do not hesitate to ask the researcher.

2. Nature and purpose of the study

The aim of the study is to observe individuals with traumatic brain injuries' communication between communication partners, both familiar and unfamiliar to them, and to note the variations in these communicative situations by comparing the events. By conducting this research we hope to gain a better understanding of what individuals with traumatic brain injuries' communication entails. There is a gap in this field of knowledge regarding communication with individuals with traumatic brain injury (TBI). Therefore, your participation in this study will assist in the improved understanding of the communication of individuals with TBI.

3. Explanation of procedures to be followed

This study consists of a minimum of two contact sessions:

1. As the familiar communication partner, you do not have to attend this session. Thus this section is strictly for information giving purposes: The first session will be comprised of a measure of the individual with TBI's suitability for the study. This session will help us to identify suitable participants with TBI for the study. You will then be asked to participate in the second phase of the study.

2. The second contact session will last for an estimate of thirty minutes to a maximum of an hour. In this session, your communication with the individual with TBI will be about ten to fifteen minutes. This interaction will be video recorded for data collection purposes. Conversation starters will be used and you and the participant with TBI will engage in one of three jointly constructed discourse tasks after instructions from the researcher. Conversation starters, based on the work of Togher et al. (2010) in the article titled: Measuring the interactions of people with traumatic brain injury and their communication partners: the Adapted Kagan scales, will be implemented.

The video recordings will then be used to analyse the communication interaction through the use of a scale, the adapted Kagan scales. This will occur after the contact sessions. The second session will take place at the rehabilitation facility the individual with TBI currently attends or at the Department of Speech-Language Pathology and Audiology (University of Pretoria).

4. What are the possible benefits of the study?

No compensation is offered for participation in this study. There is also no risk of harm or other disadvantages when participating in this study. Participation will contribute to the improved understanding of the communication of individuals with TBI. This increased knowledge may further lead to the development of future assessment and treatment services, specifically regarding communication partner training.

5. What are your rights if you take part?

You decide if you want to participate or not. You can stop participating at any point during the study without giving any reason for doing so. After participation in the study, the results of this study will be made available and explained to you.

6. Information

If you have any questions concerning this study, you may contact:

Ms Sune van der Bergh: **083 784 0194/ sunevdbergh@hotmail.com**

Mrs Bhavani Pillay: bhavani.pillay@up.ac.za

Mrs Esedra Krüger: esedra.kruger@up.ac.za

7. Confidentiality

All information gathered from this study will be kept confidential. The University of Pretoria's policy with regard to data storage states that results of this study will be stored at the Department of Speech-Language Pathology and Audiology for 15 years. The data will be locked away and stored on a password-protected computer. A hard copy of the data will also be filed and locked away. A percentage of the data will be shared with another professional for purposes of establishing reliability. Moreover, data could be made available for future research purposes. The findings of this research study will also be made available in a research report and may be reported in scientific journals, but will not identify you as a participant in this study.

Thank you for taking the time to read this information sheet

Please feel free to contact me with regard to any questions or uncertainties:

Suné van der Bergh
***Tel:* 083 784 0194**
E-mail: sunevdbergh@hotmail.com

Please indicate whether you want to participate or not in the *Certificate of Consent* form attached.

PART 2: CERTIFICATE OF CONSENT

PERMISSION FOR ADULT INDIVIDUAL TO TAKE PART IN RESEARCH STUDY

1. I agree to take part in the above-mentioned research project.

   YES ☐

   NO ☐

ONLY TICK QUESTIONS 2-9 IF YOU ANSWERED YES IN QUESTION 1

2. I confirm that I have read and understood the form entitled *Information Sheet* for the above research study. Any questions or concerns about the study have been addressed and dealt with adequately ☐
3. I understand that my participation in the research is entirely voluntary. I acknowledge the fact that I am allowed to withdraw from the research at any time and that this decision will not be held against me in any way. ☐
4. I understand that I will have to attend a maximum of two contact sessions for data collection if I choose to participate in this study ☐
5. I understand that I will be video recorded for the data collection process of this research study if I choose to participate in this study. ☐
6. I understand that the researcher will not identify me by name in any reports and that all information about me will be kept confidential. ☐
7. I understand that there are no financial benefits involved with participating in the study. ☐
8. I understand all my rights as a research participant. ☐
9. I know whom to contact about any concerns regarding the research project. ☐
10. I understand that data collected in this study may be used for future research purposes. ☐
11. I would like to receive a summary and feedback of the results of the research project, once completed.

    YES ☐

    NO ☐

Print your Name	Signature	Date
Name of person taking consent	Signature	Date

UFCP partner information leaflet and informed consent form:

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

Informed Consent Form

Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury

Dear Prospective Participant,
I, Suné van der Bergh, am a Master's degree student from the Department of Speech-Language Pathology and Audiology at the University of Pretoria. I would like you to take part in a research study titled "Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury".

The informed consent form consists of two parts:

- Information Sheet (to share information about the research with you).
- Certificate of Consent (for your signature should you agree to take part).

Yours sincerely,
Suné van der Bergh

Ms Suné van der Bergh
Researcher

Tel: 0837840194
Email: sunevdbergh@hotmail.com

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UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

PART 1: INFORMATION SHEET

Study Title: Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury

Principal Investigator: Ms Suné van der Bergh
Degree: Masters in Speech-Language Pathology
Institution: University of Pretoria
Contact number: 083 784 0194

Dear Prospective Participant

1. Introduction

You are invited to participate in a research study titled "Interaction of familiar and unfamiliar communication partners with individuals with Traumatic Brain Injury". This information leaflet is to help you decide if you would like to participate. Before you agree to take part in this study, you should fully understand what is involved. If you have any further questions, do not hesitate to ask the researcher.

2. Nature and purpose of the study

The aim of the study is to observe individuals with traumatic brain injuries' communication between communication partners, both familiar and unfamiliar to them, and to note the variations in these communicative situations by comparing the events. By conducting this research we hope to gain a better understanding of what individuals with traumatic brain injuries' communication entails. There is a gap in this field of knowledge regarding communication with individuals with traumatic brain injury (TBI). Therefore, your participation in this study will assist in the improved understanding of the communication of individuals with TBI.

3. Explanation of procedures to be followed

This study consists of a minimum of two contact sessions:

1. As the unfamiliar communication partner, you do not have to attend this session. Thus this section is strictly for information giving purposes: The first session will be comprised of a measure of the individual with TBI's suitability for the study. This session will help us to identify suitable participants with TBI for the study. You will then be matched to a participant with TBI (according to language proficiency) and be expected to take part in the second phase of the study.

2. The second contact session will last for an estimate of thirty minutes to a maximum of an hour. In this session, your communication with the individual with TBI will be about ten to fifteen minutes. This interaction will be video recorded for data collection purposes. Conversation starters will be used and you and the participant with TBI will engage in one of three jointly constructed discourse tasks after instructions from the researcher. Conversation starters, based on the work of Togher et al. (2010) in the article titled: Measuring the interactions of people with traumatic brain injury and their communication partners: the Adapted Kagan scales, will be implemented.

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Thank you for taking the time to read this information sheet

Please feel free to contact me with regard to any questions or uncertainties:

Suné van der Bergh
***Tel:* 083 784 0194**
E-mail: sunevdbergh@hotmail.com

Please indicate whether you want to participate or not in the *Certificate of Consent* form attached.

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Department of Speech-Language Pathology and Audiology

PART 2: CERTIFICATE OF CONSENT

PERMISSION FOR ADULT INDIVIDUAL TO TAKE PART IN RESEARCH STUDY

1. I agree to take part in the above-mentioned research project.

   YES ☐

   NO ☐

ONLY TICK QUESTIONS 2-9 IF YOU ANSWERED YES IN QUESTION 1

2. I confirm that I have read and understood the form entitled *Information Sheet* for the above research study. Any questions or concerns about the study have been addressed and dealt with adequately ☐
3. I understand that my participation in the research is entirely voluntary. I acknowledge the fact that I am allowed to withdraw from the research at any time and that this decision will not be held against me in any way. ☐
4. I understand that I will have to attend a maximum of two contact sessions for data collection if I choose to participate in this study ☐
5. I understand that I will be video recorded for the data collection process of this research study if I choose to participate in this study. ☐
6. I understand that the researcher will not identify me by name in any reports and that all information about me will be kept confidential. ☐
7. I understand that there are no financial benefits involved with participating in the study. ☐
8. I understand all my rights as a research participant. ☐
9. I know whom to contact about any concerns regarding the research project. ☐
10. I understand that data collected in this study may be used for future research purposes. ☐
11. I would like to receive a summary and feedback of the results of the research project, once completed.

    YES ☐

    NO ☐

Print your Name	Signature	Date
Name of person taking consent	Signature	Date

Appendix D: Adapted Kagan (MSC and MPC) scales, Togher et.al (2010)

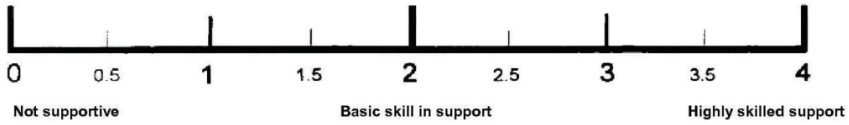
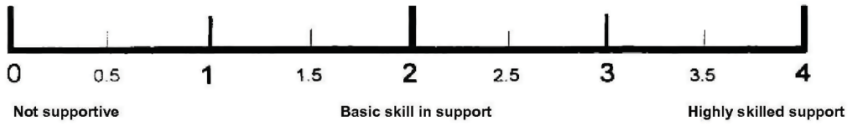
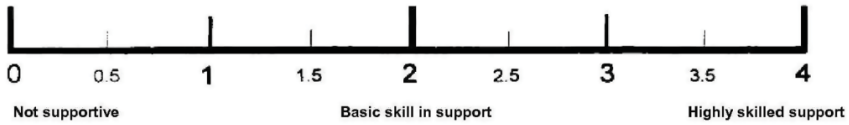
Adapted MSC scales:

A. Acknowledging Competence	
Natural adult talk appropriate to context	• Feel and flow of natural adult conversation appropriate to context, ○ e.g., social chat vs. interview; respectful approach to verification (verifying that the conversation partner has understood rather than verifying that adult with brain injury knows what they want to say; not over-verifying) • Not patronizing (loudness, tone of voice, rate, enunciation) • Appropriate emotional tone / use of humour • Uses collaborative talk (rather than teaching / testing) • Establishes equal leadership roles in the conversation • Uses true questions rather than testing questions
Sensitivity to partner	• Incorrect / unclear responses handled respectfully by giving correct information in a non-punitive manner • Sensitive to TBI's attempts to engage in conversation, Confirms partner's contribution. • Encourage when appropriate, Shows enthusiasm for partner's contribution. • Acknowledge competence when adult with brain injury is frustrated e.g., "I know you know what you want to say.", Acknowledges difficulties. • "Listening attitude", Demonstrates active listening (e.g. acknowledging, back-channelling) • Takes on communicative burden as appropriate / making adult with brain injury feel comfortable • Communicates respect for other person's concerns, perspectives and abilities • Questions in a non-demanding, supportive manner • Takes appropriate conversational turns
Score MSC Acknow *Comp:*	

A. Acknowledging Competence Anchors		
NONE	0	Competence of person with TBI **not acknowledged**. Patronising.
	1	**Minimally acknowledges** competence of person with TBI.
BASIC	2	Basic level of skill. **Some acknowledgement** of the competence of person with TBI.
	3	**Mostly acknowledges** the competence of person with TBI.
HIGHLY	4	Interactionally outstanding. **Full acknowledgement** of the competence of the person with TBI.

B. Revealing Competence

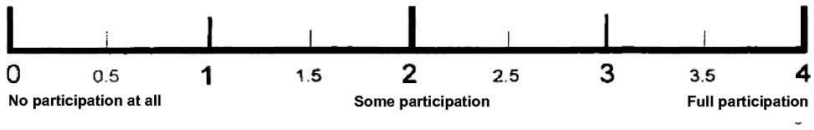
1. Ensure adult understands (e.g. topic, questions)	• Verbal (e.g. short, simple sentences; redundancy; is there some verbal adaptation?)
	• Nonverbal
	  ○ Gesture — Meaningful; slightly exaggerated; used to emphasize or clarify
	  ○ Writing — Clear and visible; appropriate key words
	  ○ Resources — Used only when necessary (would something simpler suffice?)
	• Response to communicative cues (e.g., reacting to facial expressions indicating confusion?)
	• Gives cues in a conversational manner
	• Provides an appropriate level of cognitive support (e.g. referring to diary, making notes)
	• Organises information in the conversation as clearly as possible to support comprehension (e.g., sequential order, causality, similarity and difference, association)
	• Makes connections between topics, reviews organisation of information (e.g. summarises)

Score MSC ***Reveal Comp 1:***	
2. Ensure adult has means of responding *(and elaborating)*	• Response to communicative cues (e.g., giving enough time to respond) • Establishes equal leadership roles in the conversation • Introduces and initiates topic of interest • Allows partner to take appropriate conversational turns • Maintains the topic by adding information • Invites elaboration (e.g. uses open-ended questions, statements, links to experiences of TBI) • Uses questions appropriate to person's ability (e.g. simple or closed questions when necessary) • Helps partner express thoughts when struggle occurs
Score MSC ***Reveal Comp 2:***	
3. **Verification** (Accuracy of adult's response not assumed)	• Response to communicative cues (e.g. infers intended message of the person with brain injury, based on all available cues) • Confirms understanding of what has been said (paraphrasing, checking) • Uses clarifying questions as appropriate • *Note:* Verification often involves checking in a different way (e.g., using a yes/no question)
Score MSC ***Reveal Comp 3:***	

B. Revealing Competence Anchors

NONE	0	**No use of techniques** to reveal competence. **Inhibits the potential participation** of the person with TBI.
	1	**Low level of skill** in revealing competence. **Minimises the potential participation** of the person with TBI.
SOME	2	**Basic level of skill**. Uses techniques to **maintain the potential participation** of the person with TBI. Able to get some information from the person with TBI.
	3	**Uses techniques to promote the potential participation** of the person with TBI.
FULL	4	Technically outstanding. **Uses techniques to maximise the potential participation** of the person with TBI. May not always succeed, but applies techniques flexibly and in a sophisticated way.

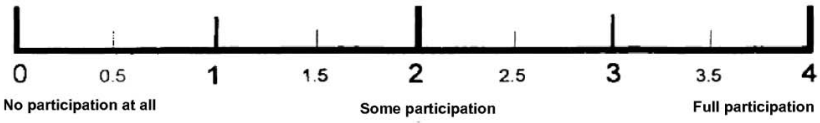
Adapted MPC scales:

A. Interaction	
Verbal / vocal	• Does TBI share responsibility for maintaining feel/flow of conversation (incl: appropriate affect)? • Does TBI add information to maintain the topic? • Does TBI ask questions of ECP which follow-up on the topic? • Does TBI use appropriate turn-taking (taking their turn, passing turn to ECP appropriately)? • Does TBI demonstrate active listening (e.g. acknowledging, backchannelling)? • Does TBI choose appropriate topics and questions for the context? • Does TBI show communicative intent even if content is poor?
Nonverbal	• Does TBI initiate / maintain interaction with CP or make use of supports offered by CP to initiate / maintain interaction? • Is TBI pragmatically appropriate? • Does TBI ever acknowledge the frustration of the CP or acknowledge their competence/skill? • Behaviours might include: ○ Appropriate eye contact, use of gesture, body posture and facial expression, use of writing or drawing in any form, use of resource material
Score MPC *Interaction*:	

A. Interaction Anchors		
NONE	0	**No participation at all**. No attempt to engage with communication partner or respond to their interactional attempts.
	1	Person with TBI beginning to take **occasional responsibility for sharing the conversational interaction**, in order to achieve the purpose of the task.
SOME	2	Person with TBI making **clear attempts to share the conversational interaction some of the time**, in order to achieve the purpose of the task.
	3	Person with TBI **taking increased responsibility most of the time** for sharing the conversational interaction, in order to achieve the purpose of the task.
FULL	4	Person with TBI has **full and appropriate participation**. Takes responsibility for sharing the conversational interaction, in order to achieve the purpose of the task.

B. Transaction	

Verbal / vocal and Nonverbal	• Does TBI maintain exchange of information, opinions and feelings with CP, by sharing details or by inviting CP to share details? (i.e. is there good content and more than intent alone)?
	• Does TBI present information in an organised way?
	• Does TBI provide an appropriate amount of information?
	• Does TBI ask clarifying questions when necessary?
	• Does TBI ever initiate transaction?
	  • Introducing or referring back to a previous topic
	  • Spontaneously using a compensatory technique
	• Does content of transaction appear to be accurate? (depending on context and purpose of rating, rater would have more/less access to means of verification of information)
	• Does TBI use support offered by CP for purpose of transaction? Eg., Referring to a list/diary, using the organization of the conversation provided by CP (e.g. responding to closed choice questions)

Score MPC *Transaction*:	

B. Transaction Anchors		
NONE	0	**No evidence** of person with TBI **conveying content,** in order to achieve the purpose of the task.
	1	Person with TBI occasionally **conveying content**, in order to achieve the purpose of the task.
SOME	2	Person with TBI is **conveying some content,** in order to achieve the purpose of the task.
	3	Person with TBI is **conveying content most of the time,** in order to achieve the purpose of the task.
FULL	4	Person with TBI **consistently conveys content** in order to achieve the purpose of the task.

Appendix E: Data collection sheet

Adapted MPC AND MSC SCALES

Participant Code: _____

Date: _____

Rated by: _____

MPC

Measure of level of Participation in Conversation (for partners with TBI)

Interaction	☐
Transaction	☐

MSC

(Skill of Conversation Partner)

Acknowledge competence	☐
Reveals competence	☐
1. Ensure adult understands	☐
2. Ensuring adult has means to responding	☐
3. Verification	☐

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ADAPTED MSC SCALES - Measure of skill in Supported Conversation

A. Acknowledging Competence		Score	
Natural adult talk appropriate to context	• Feel and flow of natural adult conversation appropriate to context, o e.g., social chat vs. interview; respectful approach to verification (verifying that the conversation partner has understood rather than verifying that adult with brain injury knows what they want to say; not over-verifying) • Not patronizing (loudness, tone of voice, rate, enunciation) • Appropriate emotional tone / use of humour • Uses collaborative talk (rather than teaching / testing) • Establishes equal leadership roles in the conversation • Uses true questions rather than testing questions	V1	
		V2	
		V3	
		V4	
		V5	
		V6	
Sensitivity to partner	• Incorrect / unclear responses handled respectfully by giving correct information in a non-punitive manner • Sensitive to TBI's attempts to engage in conversation, Confirms partner's contribution. • Encourage when appropriate, Shows enthusiasm for partner's contribution. • Acknowledge competence when adult with brain injury is frustrated e.g., "I know you know what you want to say.", Acknowledges difficulties. • "Listening attitude", Demonstrates active listening (e.g. acknowledging, back-channelling) • Takes on communicative burden as appropriate / making adult with brain injury feel comfortable • Communicates respect for other person's concerns, perspectives and abilities • Questions in a non-demanding, supportive manner • Takes appropriate conversational turns	V7	
		V8	
		V9	
		V10	
		V11	
		V12	
		V13	
		V14	
		V15	
Score MSC Acknow *Comp:*	0 0.5 1 1.5 2 2.5 3 3.5 4 Not supportive — Basic skill in support — Highly skilled support	**Average:**	

A. Acknowledging Competence Anchors		
NONE	0	Competence of person with TBI not acknowledged. Patronising.
	1	Minimally acknowledges competence of person with TBI.
BASIC	2	Basic level of skill. Some acknowledgement of the competence of person with TBI.
	3	Mostly acknowledges the competence of person with TBI.
HIGHLY	4	Interactionally outstanding. Full acknowledgement of the competence of the person with TBI.

B. Revealing Competence

		Score	
1. Ensure adult understands (e.g. topic, questions)	• Verbal (e.g. short, simple sentences; redundancy; is there some verbal adaptation?) • Nonverbal o Gesture — Meaningful; slightly exaggerated; used to emphasize or clarify o Writing — Clear and visible; appropriate key words o Resources — Used only when necessary (would something simpler suffice?) • Response to communicative cues (e.g., reacting to facial expressions indicating confusion?) • Gives cues in a conversational manner • Provides an appropriate level of cognitive support (e.g. referring to diary, making notes) • Organises information in the conversation as clearly as possible to support comprehension (e.g., sequential order, causality, similarity and difference, association) • Makes connections between topics, reviews organisation of information (e.g. summarises)	V16 V17 V18 V19 V20 V21 V22	
Score MSC *Reveal Comp 1:*	0 0.5 1 1.5 2 2.5 3 3.5 4 Not supportive — Basic skill in support — Highly skilled support		**Average:**
2. Ensure adult has means of responding *(and elaborating)*	• Response to communicative cues (e.g., giving enough time to respond) • Establishes equal leadership roles in the conversation • Introduces and initiates topic of interest • Allows partner to take appropriate conversational turns • Maintains the topic by adding information • Invites elaboration (e.g. uses open-ended questions, statements, links to experiences of TBI) • Uses questions appropriate to person's ability (e.g. simple or closed questions when necessary) • Helps partner express thoughts when struggle occurs	V23 V24 V25 V26 V27 V28 V29 V30	
Score MSC *Reveal Comp 2:*	0 0.5 1 1.5 2 2.5 3 3.5 4 Not supportive — Basic skill in support — Highly skilled support		**Average:**
3. Verification (Accuracy of adult's response not assumed)	• Response to communicative cues (e.g. infers intended message of the person with brain injury, based on all available cues) • Confirms understanding of what has been said (paraphrasing, checking) • Uses clarifying questions as appropriate • *Note:* Verification often involves checking in a different way (e.g., using a yes/no question)	V31 V32 V33 V34	
Score MSC *Reveal Comp 3:*	0 0.5 1 1.5 2 2.5 3 3.5 4 Not supportive — Basic skill in support — Highly skilled support		**Average:**

B. Revealing Competence Anchors

NONE	0	No use of techniques to reveal competence. Inhibits the potential participation of the person with TBI.
	1	Low level of skill in revealing competence. Minimises the potential participation of the person with TBI.
SOME	2	Basic level of skill. Uses techniques to maintain the potential participation of the person with TBI. Able to get some information from the person with TBI.
	3	Uses techniques to promote the potential participation of the person with TBI.
FULL	4	Technically outstanding. Uses techniques to maximise the potential participation of the person with TBI. May not always succeed, but applies techniques flexibly and in a sophisticated way.

ADAPTED MPC SCALES - Measure of Participation in Conversation

A. Interaction		Score	
Verbal / vocal	• Does TBI share responsibility for maintaining feel/flow of conversation (incl: appropriate affect)?	V35	
	• Does TBI add information to maintain the topic?	V36	
	• Does TBI ask questions of ECP which follow-up on the topic?	V37	
	• Does TBI use appropriate turn-taking (taking their turn, passing turn to ECP appropriately)?	V38	
	• Does TBI demonstrate active listening (e.g. acknowledging, backchannelling)?	V39	
	• Does TBI choose appropriate topics and questions for the context?	V40	
	• Does TBI show communicative intent even if content is poor?	V41	
Nonverbal	• Does TBI initiate / maintain interaction with CP or make use of supports offered by CP to initiate / maintain interaction?	V42	
	• Is TBI pragmatically appropriate?	V43	
	• Does TBI ever acknowledge the frustration of the CP or acknowledge their competence/skill?	V44	
	• Behaviours might include: o Appropriate eye contact, use of gesture, body posture and facial expression, use of writing or drawing in any form, use of resource material	V45	
Score MPC *Interaction*:	0 0.5 1 1.5 2 2.5 3 3.5 4 No participation at all — Some participation — Full participation	Average:	

A. Interaction Anchors		
NONE	0	**No participation at all.** No attempt to engage with communication partner or respond to their interactional attempts.
	1	Person with TBI beginning to take **occasional responsibility for sharing the conversational interaction**, in order to achieve the purpose of the task.
SOME	2	Person with TBI making **clear attempts to share the conversational interaction some of the time**, in order to achieve the purpose of the task.
	3	Person with TBI taking **increased responsibility most of the time** for sharing the conversational interaction, in order to achieve the purpose of the task.
FULL	4	Person with TBI has **full and appropriate participation.** Takes responsibility for sharing the conversational interaction, in order to achieve the purpose of the task.

B. Transaction		Score	

Verbal / vocal and Nonverbal	• Does TBI maintain exchange of information, opinions and feelings with CP, by sharing details or by inviting CP to share details? (i.e. is there good content and more than intent alone)?
	• Does TBI present information in an organised way?
	• Does TBI provide an appropriate amount of information?
	• Does TBI ask clarifying questions when necessary?
	• Does TBI ever initiate transaction?
	  ◦ Introducing or referring back to a previous topic
	  ◦ Spontaneously using a compensatory technique
	• Does content of transaction appear to be accurate? (depending on context and purpose of rating, rater would have more/less access to means of verification of information)
	• Does TBI use support offered by CP for purpose of transaction? Eg., Referring to a list/diary, using the organization of the conversation provided by CP (e.g. responding to closed choice questions)
		V46	

		V47	
		V48	
		V49	
		V50	
		V51	
		V52	
Score MPC *Transaction*:	0 0.5 1 1.5 2 2.5 3 3.5 4 No participation at all — Some participation — Full participation	Average:	

B. Transaction Anchors		
NONE	0	**No evidence** of person with TBI **conveying content**, in order to achieve the purpose of the task.
	1	Person with TBI occasionally **conveying content**, in order to achieve the purpose of the task.
SOME	2	Person with TBI is **conveying some content**, in order to achieve the purpose of the task.
	3	Person with TBI is **conveying content most of the time**, in order to achieve the purpose of the task.
FULL	4	Person with TBI **consistently conveys content** in order to achieve the purpose of the task.

Appendix F: Proof of Article submission confirmation

Disability and Rehabilitation

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Submission Confirmation

Print

Thank you for your submission

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Title
Interaction of familiar and unfamiliar communication partners with individuals with traumatic brain injury

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