

# Narrative Discourse Intervention After Traumatic Brain Injury

## A Systematic Review of the Literature

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**Purpose:** Narrative discourse (e.g., telling anecdotes or relating personal events) comprises a key part of social interaction and is commonly affected after traumatic brain injury (TBI). Research over the past decades has enabled improved characterization of discourse impairment after TBI, but a critical lack of research into discourse intervention approaches remains. **Methods:** This systematic review examined empirical research on narrative discourse intervention after TBI. Searches were conducted on EMBASE, CINAHL, PsycINFO, and PubMed for original research on spoken narrative discourse treatment, where at least 50% of the study participants were adults with TBI. **Results:** Of 519 screened articles, six studies met criteria: three single case studies and three case series studies. Interventions incorporated metacognitive and metalinguistic theoretic principles, with a focus on understanding the structure and elements of narratives. Active components of treatments are discussed and compared in relation to existing narrative discourse treatment programs for other neurological communication disorders. **Conclusions:** Although all studies reported gains on some measures for treated narratives following intervention, there were mixed results for effect generalization and/or maintenance. The INCOG guidelines recommend that interventions after TBI should be contextualized and involve personally relevant materials, and this was not evident in the reviewed intervention approaches. Directions are suggested for clinical practice and future research in treating narratives. **Key words:** *cognitive communication, cognitive rehabilitation, narrative discourse, speech-language pathology, traumatic brain injury*

**T**HERE IS now a substantial body of evidence demonstrating that people with traumatic brain injury (TBI) experience difficulties with discourse production as a

primary area affected after injury (Ponsford et al., 2014). Impairments of discourse function contribute to relationship breakdown (Ponsford et al., 2014), reduced ability to return to work (Douglas et al., 2016) and psychosocial dysfunction (Elbourn, Kenny, Power, & Togher, 2019). The heterogeneity of the clinical population, both before and after injury, makes this a complex area of speech-language pathology (SLP) practice, with “normal” discourse and social behaviors being problematic to define, measure, and target in therapy. After injury, there may be any combination of cognitive and linguistic impairments, dependent on the unique pattern of brain damage for the person. The vast majority of empirical SLP literature has reported on characteristics of impairments in narratives of people with TBI, with relatively little research focused on how to address these in

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intervention. However, improving discourse-level communication for adults with TBI is a key rehabilitation goal within SLP management of cognitive communication impairments after TBI (Togher et al., 2014).

Discourse impairments can be detected in both monologic and dialogic TBI discourse samples, and for assessment purposes, it is important to evaluate both genres. In everyday interactions, different discourse genres are integrated naturally. One example is through conversational storytelling, during which narratives (e.g., telling stories, anecdotes, relating personal events) are exchanged within everyday talk (Norrick, 2000). Exploring narrative-based discourse interventions may be a valuable starting point for developing a treatment that will improve everyday communication skills (Togher et al., 2014). To set the background for this review, an overview of existing cognitive and social interventions for TBI will be provided, followed by a discussion of the important elements of narrative discourse, with a final discussion on the value of a systematic review on this topic.

## COGNITIVE AND SOCIAL INTERVENTIONS

In recent years, various communication-based interventions have been reported for cognitive and social communication changes after TBI. A previous review of social communication intervention approaches by Finch et al. (2016) identified two main approaches to remediation, based on Ylvisaker (2003)'s classification of impairment-specific (traditional) approaches and context-sensitive approaches (Finch et al., 2016). Impairment-specific interventions target process-specific, discrete, cognitive or language components in isolation, whereas a context-sensitive approach addresses multiple component functions to improve the client's participation in communicative activities (Ylvisaker, 2003). Types of impairment-specific interventions for cognitive communication include behavioral treatment of verbal interaction skills

(Giles et al., 1988) and treatment of emotion perception (Radice-Neumann et al., 2009). Examples of context-sensitive approaches include communication partner training (Behn et al., 2021; Tessier et al., 2020); social skills training, most commonly group-based (e.g., Group Interactive Structured Treatment; GIST); and metacognitive strategy intervention (MSI, also known as metacognitive strategy training). Other approaches incorporate a combination of these approaches, such as the Communication-specific Coping Intervention (CommCope-I) treatment targeting communication coping in the context of communicative breakdowns (Douglas et al., 2015); or project-based intervention focused on collaborative group work (Behn et al., 2019a, 2019b). These various approaches may share common features and techniques; for example, most context-sensitive treatment programs incorporate increasing awareness and improving metacognition, key components of MSI. Use of context-sensitive approaches for management of cognitive-communication disorders is supported in recommendations by INCOG, an international group of researchers and clinician (Togher et al., 2014).

Communication partner training targets interactional exchanges between people with TBI and their communication partners, with a focus on dialogic conversation as a whole. By viewing both parties of the interaction as having responsibility for effective communication, communication partner training aims to increase the capabilities of the communication partner to support conversations, as well as to improve the contribution of the person with TBI. Outcome measures for communication partner training may include ratings of communication skills of the communication partner as well as the person with TBI, with scales such as the Adapted Kagan Scales, which measure communication partner support from party perspectives (Togher, Power et al., 2010), questionnaires, or conversational discourse analysis methods (Behn et al., 2021). This approach has been shown to be effective at improving conversational

interactions after TBI in two randomized controlled trials (RCTs; Behn et al., 2012; Togher et al., 2013) and in systematic reviews (Behn et al., 2021; Wiseman-Hakes et al., 2019).

Social skills group training has been found to improve social communication ability after TBI (Braden et al., 2010; Dahlberg et al., 2007). These groups may target social competence (Harrison-Felix et al., 2018) with outcome measures including rating scales of pragmatic performance (e.g., the La Trobe Communication Questionnaire (LCQ; Douglas et al., 2007), goal attainment scaling (GAS), and the Satisfaction with Life Scale (Braden et al., 2010). As described in Dahlberg et al. (2007), social skills group training typically might involve cofacilitation by social work or psychology professionals, with intervention content that includes increasing self-awareness and use of self-assessment in goal setting. The group setting is used to encourage interaction and practice social skills. While social skills group intervention targets include interactional discourse, the focus of this approach is primarily on social behaviors in interactions (see Keegan et al., 2020) rather than the quality of the individual's spoken discourse and its role in interactional success.

The CommCope-I treatment targets development of productive behaviors for the client with TBI to use in a range of communication environments by improving coping strategies to deal with communication breakdowns. CommCope-I has been described in a single case experimental study (Douglas et al., 2015) and a pre-/postintervention study with repeated measures (Douglas et al., 2019), with reported positive effects on The Communication-Specific Coping Scale—Research version (CommSpeCS), which rates the ability of the participant to use productive coping strategies in discourse situations, the LCQ, measures of stress, and of participation in activities.

The theory underpinning MSI is that metacognitive strategies (i.e., strategies to improve “thinking about thinking”) can be explicitly taught, consequently leading to increased control over adverse behaviors.

This has been reported in research with a manualized treatment program called IMPACT (Intervention for Metacognition and Social Participation: an Acquired Cognitive-Communication Disorder Treatment), which is focused on achieving individualized social communication goals for people with TBI, with pilot studies reporting benefits (Copley et al., 2015; Finch et al., 2017). This treatment program was conducted in group sessions with outcome measures including rating scales such as the Profile of Pragmatic Impairment in Communication (Linscott et al., 2018) and GAS. In relation to social communication skills, the authors reported that social communication can be improved by targeting a specific function required to support successful interaction, such as self-awareness, predictive ability, self-monitoring, and self-control (Finch et al., 2017), and has been successfully implemented with adults after TBI to target executive function and receptive language ability (Copley et al., 2015). As with the treatments described previously, although an individual's goal might include narrative discourse ability, the intervention does not specifically aim to provide instruction in storytelling ability.

Cognitive and social interventions for TBI have mostly included programs that incorporate a global, context-specific approach to rehabilitation, with primary outcome measures that rely on rating scales (Finch et al., 2016, 2017). Although narratives, or storytelling, may form part of these types of interventions within the broader context of social interactions, the narratives themselves have not been specifically targeted or measured as part of the treatment. Given their importance in everyday communication skills, it is surprising that narratives have not been more a focus for treatment, and there is clearly a need for further research on the topic of narrative-based interventions for TBI.

## NARRATIVE DEFINITION AND ANALYSIS

Difficulty with spoken narrative discourse is well reported following moderate to severe TBI (Coelho et al., 1995; Snow et al., 1999).

However, the methods for capturing and measuring narrative discourse impairments are varied. The quality of narratives in discourse can be analyzed at different linguistic levels. Le, Mozeiko, and Coelho (2011) described four levels of analysis: within-sentence or microlinguistic analysis (e.g., examining lexical errors, productivity), across-sentence or microstructural measures (e.g., cohesion analysis), text-level or macrolinguistic analysis (of local and global coherence), and superstructure (e.g., story grammar) or macrostructure, which examines the overall organization of the sample (Le, Mozeiko, & Coelho, 2011).

After TBI, changes to discourse typically result from the impact of cognitive impairments on communication. A main focus for discourse analysis with people with cognitive communication disorder without language impairment is on the quality of the global discourse by examining content, informativeness, and organization or structure (Le, Coelho, et al., 2011). These features are measured using macrolinguistic, macrostructural, and superstructural analysis. In descriptive terms, a good narrative would typically be expected to have the following features: it should be the right length, on topic, cohesive, provide an adequate amount of information based on listener knowledge, and be structured in a logical order (Coelho, 2002; Coelho et al., 2003; Linnik et al., 2016).

Macrolinguistic analysis approaches to examining the discourse of people with TBI include gist summarization, or identifying the central idea of a discourse sample, and coherence, both local (linking of two sentences) and global (linking of ideas to main theme) coherence (Galletto et al., 2013; Ghayoumi Anaraki et al., 2014; Glosser & Deser, 1991; Hough & Barrow, 2003).

Measures used to examine the superstructure and macrostructure of TBI narrative discourse samples include the Story Goodness Index (SGI; Le, Coelho, et al., 2011; Lindsey et al., 2019), and main concept analysis (Elbourn, Kenny, Power, Honan et al., 2019). The SGI captures the quality of the discourse globally by simultaneously examining orga-

nization, content, and informativeness (Le, Coelho, et al., 2011). Main concept analysis considers both accuracy and completeness of ideas conveyed in a narrative, capturing microstructural (e.g., pronoun referents), macrostructural (e.g., coherence), and superstructural (e.g., sequencing of ideas) elements of a narrative (Elbourn, Kenny, Power, Honan, et al., 2019). In terms of superstructure, well-organized narratives typically have a recognized internal structure (Snow et al., 1999). This structure is often described using Stein and Glenn's (1979) story grammar schema, with seven logically related elements: (1) setting, (2) initiating event, (3) internal response, (4) plans, (5) attempts, (6) direct consequences, and (7) reactions (Stein & Glenn, 1979). Story grammar has been used in several studies to characterize TBI discourse and differentiate from normal (e.g. Coelho, 2002; Jorgensen & Togher, 2009; Snow et al., 1999) and to monitor recovery after injury (Steel et al., 2017).

In addition to story grammar to describe the organization of a narrative, other key concepts include the informativeness of the narrative (i.e., conveying the essential information), cohesion and coherence, multi-level approaches addressing the connection between them, and overall communicative effectiveness and efficiency (Linnik et al., 2016). These measures have been used in numerous TBI studies (e.g., Glosser & Deser, 1991; Hartley & Jensen, 1991; Power et al., 2020) as part of assessment processes and to identify and diagnose TBI discourse characteristics.

In Bryant et al. (2016) literature review of linguistic discourse analyses used in aphasia research (including treatment studies), narrative discourse was found to be the most analyzed genre of discourse. The majority of studies in this review were reported to use microlinguistic rather than macrostructural levels of analysis. The review found that schema-level discourse measures, or those relating to the overarching sample structure, and cohesion-level analyses were the least frequently applied analyses for aphasic

discourse, with fewer than 15 studies using these macrostructural levels of analysis for discourse samples of people with aphasia, compared with more than 70 or more studies reporting on lexical and syntactic measures. It is not clear whether these analyses were applied as outcome measures after intervention (as part of the 78 of the 165 studies included in the review had this focus) or rather, for characterizing features of aphasia (in 87 of the 165 studies). Whilst a variety of discourse analysis levels are available to characterize features of TBI discourse and to differentiate this from normal, microlinguistic measures may be less relevant for other assessment purposes after TBI (e.g., for goal and intervention planning, diagnosis, monitoring recovery) and may not be a priority for use in intervention. Schema-level measures such as productivity and efficiency of verbal output, content accuracy and organization, story grammar, and coherence measures consistently detect the communication disorders that result from TBI whereas microlinguistic analyses such as syntax, grammatical complexity, and cohesion have typically been less reliable (Coelho et al., 2005). Psychometric evaluation of discourse measures is generally lacking; however, there is emerging evidence of good reliability for a number of schematic-level measures such as story grammar and propositional-level analyses (Pritchard et al., 2017).

## NARRATIVE INTERVENTION

Although there are few studies that specifically report on monologic discourse intervention (rather than assessment) for adults with TBI, narrative discourse interventions have been reported in other clinical populations with acquired communication disorders, particularly with people with aphasia (Bryant et al., 2016; Bryant et al., 2017; Dipper et al., 2020). Accordingly, a 2015 review of aphasia rehabilitation practices identified discourse treatments as a priority research area (Rose et al., 2014). In a recent literature review of discourse interventions for people

with aphasia (Dipper et al., 2020), 25 studies were found that targeted discourse treatment. The majority of these studies reported on outcomes at the word level and sentence level, with two studies of the 25 classified as treating narratives at the macrostructural level and three studies at multilevel of analysis that included macrostructural analyses, reflecting the prioritization of linguistic levels of analysis for people with aphasia. The developing body of literature on narrative discourse interventions for people with aphasia offers a valuable starting point for considering narrative-based intervention for TBI. Clearly, there is a need to explore narrative discourse intervention for TBI specifically, as the aphasia-based treatment programs may not adequately address the superstructural and macrostructural elements that are more commonly affected following TBI.

## AIMS

Previous literature reviews of interventions for cognitive and social communication intervention for people with TBI have focused on the broader area of social and behavioral treatments (e.g., Finch et al., 2016), discourse interventions for acquired brain injury more generally (Gindri et al., 2014), or on treatment for interactional exchanges (Wiseman-Hakes et al., 2019). Narrative discourse interventions have been found to be successful for people with aphasia (Dipper et al., 2020). In view of the potential benefits of narrative interventions for individuals with TBI, the purpose of this review was to systematically evaluate the current research evidence on narrative intervention after TBI to guide decision making and inform future research on this topic.

The overall aim of this research was to investigate current reports of intervention to improve narrative discourse for adults with TBI using a systematic review. Systematic reviews are useful to examine the key characteristics of research related to a particular topic (Munn et al., 2018). We were interested in (1) determining whether interventions

were effective in improving narrative ability after TBI, (2) understanding the rationales and/or theoretical bases used to support the therapy, and (3) describing the active components of the intervention, including materials used in the therapy and treatment content strategies (Schulz et al., 2010).

**METHODS**

This study evaluated current treatment approaches for improving narrative discourse following TBI. We conducted a search in August 2019 on four databases: EMBASE, CINAHL, PsycINFO, and PubMed, using variants of terms in four key areas. These comprised terms relating to narrative discourse (discourse; narrative; monolog\*; story grammar), intervention terms (intervene\*; therap\*; treat\*; rehabilitation; training; remediation; readaptation; re-education; functional recovery), TBI (TBI; ABI; brain damage; acquired brain injur\*; head injur\*; traumatic brain injur\*), and communication (communicat\*; language; linguistic). The filters “adult” and “in English” were added to searches, with

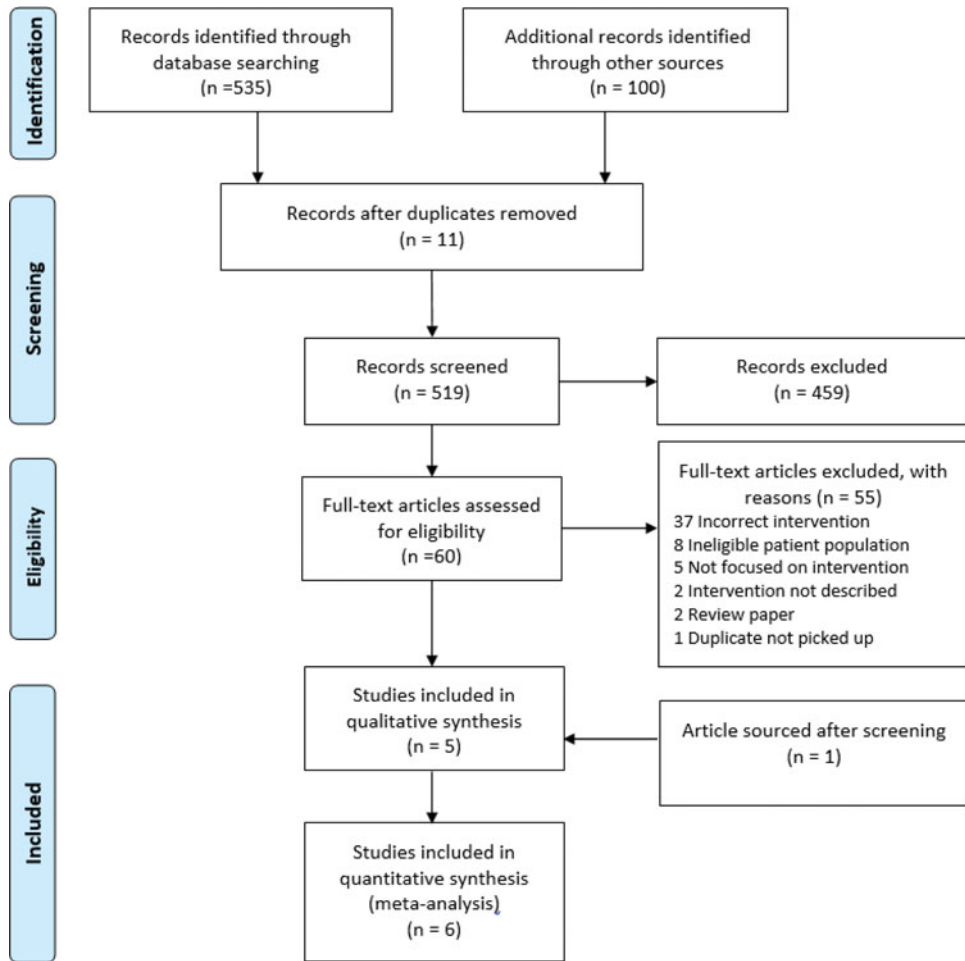
no date restrictions. See Table 1 for inclusion and exclusion criteria. A total of 519 articles were screened. Following screening of titles and abstracts, full texts of 60 articles were read by the first and second authors to assess eligibility. In addition to database searching, hand searches of backward and forward citations of key articles were undertaken. Following this process, a total of five studies were identified for analysis. In January 2020, another relevant article that met the inclusion criteria was identified and added to the study, making total of six included studies (see Figure 1). A subsequent search was conducted at this time, with no further studies identified.

After screening, data were extracted and categorized using the Intervention Taxonomy (ITAX; Schulz et al., 2010), as has been described previously in SLP research (O’Rourke et al., 2018). This checklist allowed for detailed data extraction on intervention delivery characteristics (e.g., mode, materials, location, and schedule) and content of intervention (e.g., strategies, mechanisms of action).

**Table 1.** Inclusion/exclusion criteria

	Include	Exclude
Participants	At least 50% of the participants were adults who had experienced a mild-severe TBI as an adult (> 16 years at the time of injury), with individual outcome data reported	Studies with aphasia or other primary communication diagnoses. Studies including pediatric or adolescent populations
Study design	Original research Intervention study All Oxford Centre for Evidence Based Medicine levels accepted	Reviews, diagnostic or prognostic studies or screening studies, conference abstracts, or proceedings
Outcome	Spoken narrative discourse was one of the therapy activities	Studies with a focus on assessment only; no intervention, treatment, or therapy relating to spoken narrative.
Access and other publication details	Access to the full text in English Peer-reviewed	

*Note.* TBI = traumatic brain injury.



**Figure 1.** Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram detailing search strategy and selection criteria. This figure is available in color online ([www.topicsinlanguage disorders.com](http://www.topicsinlanguage disorders.com)).

Typically, the quality of evidence in the research studies is categorized according to a hierarchy with the highest level of evidence (Level 1) for treatment of N-of-1 randomized trials or systematic reviews of randomized trials (OCEBM Levels of Evidence Working Group, 2011). Controlled group studies may be evaluated using the modified Physiotherapy Evidence Database scale (PEDro-P, Maher et al., 2003). However, because RCTs are infrequently conducted in research on discourse intervention after acquired brain injury and single case designs are common, we used a critical appraisal method appropriate for the type of study we expected to

find. The Risk of Bias in N-of-1 Trials scale (RoBiNT: Tate et al., 2015), is suitable for evaluating the quality of a range of single case experimental designs, such as withdrawal/reversal, multiple baseline, changing criterion, alternating treatment designs, and quasi-experimental bi-phasic (AB) designs. N-of-1 single case experimental design studies can be rated as the highest level of evidence, if there is adequate control for the effects of the intervention by use of multiple phases of intervention and repeated measurement throughout phases. These features can be rated using the RoBiNT's 15 criteria rating scale examining internal and external validity

factors. The RoBiNT's internal validity scales relate to the study's design, randomization, sampling, blinding, interrater agreement, and treatment adherence. The external validity items rate the study's reporting of baseline characteristics, setting, dependent and independent variables, recording and analysis of data, replication, and generalization. For studies with no control group, the Quality Assessment Tool for Before-After Studies with no control group was conducted (National Heart, Lung, and Blood Institute, 2014). This tool has 12 rating areas to assess the risk of bias in the study relating to flaws in design or implementation of the study. A rating of "Good" indicates a low risk of bias, a "Fair" study indicates some risk of bias (not sufficient to invalidate findings), and studies rated as "Poor" would have a significant risk of bias.

## RESULTS

Of the six included studies on narrative discourse treatment for people with TBI, three originated from the same research group and reported on Cognitive Pragmatic Treatment (Bosco et al., 2018; Gabbatore et al., 2015; Parola et al., 2019). Cognitive Pragmatic Treatment is described as a social communication program with a distinct component that targeted narratives, and the three studies using this treatment will be reported together. The session topics, spread across one to two 60-min sessions, included: Awareness of the deficit; General communicative ability; Linguistic ability; Extralinguistic ability; Paralinguistic ability; Social appropriateness ability; Conversational ability; Management of telephone conversation; Planning ability; Theory of mind; Narrative ability; General communicative ability; and Summing-up and post-training awareness. Other interventions were the Novel Approach to Real life communication: Narrative Intervention in Aphasia (NARNIA) program (Whitworth et al., 2020), Discourse Processing Treatment (DPT; Kintz et al., 2018), and story grammar interven-

tion (Cannizzaro & Coelho, 2002). The three Cognitive Pragmatic Treatment studies provided intervention in groups and the other studies delivered intervention individually (Cannizzaro & Coelho, 2002; Kintz et al., 2018; Whitworth et al., 2020). In the study by Whitworth et al. (2020), two of the four participants had acquired brain injury of non-traumatic cause; only individual outcome data from the two TBI participants were included in this review.

With the exception of the story grammar treatment, other programs were manualized and have been used with other clinical populations and/or individuals with other SLP diagnoses. The NARNIA program, used in this instance with people with cognitive communication impairments including two with TBI and two with stroke (Whitworth et al., 2020), has also been used for treating adults with aphasia (Whitworth et al., 2015) and primary progressive aphasia (Whitworth et al., 2018). Cognitive Pragmatic Treatment has been reported as being successful in improving cognitive pragmatic abilities of adults with schizophrenia (Bosco et al., 2016), and DPT has been used as a narrative treatment for adults with aphasia (Frisco, 2015), with reported gains on measures of trained and untrained discourse production for some of the five participants in the study.

## Quality of studies

Three of the studies used a single case study design (Cannizzaro & Coelho, 2002; Kintz et al., 2018; Whitworth et al., 2020) and were rated using the RoBiNT Scale. Table 2 shows the ratings for each of the 15 items for each of these studies. The studies scored between 8 and 14 (maximum = 30) overall. According to the RoBiNT classification algorithm (Perdices et al., 2019), these were all classified as "Very Low" overall for methodological quality. Internal validity subscale scores were between 2 and 3 (maximum = 14) reflecting overall low quality for internal validity, and external validity scores were between 6 and 11 (maximum = 16)



**Table 2.** RoBiNT ratings for studies using N-of-1 trials

RoBiNT Item	Authors		
	Cannizzaro and Coelho (2002)	Kintz et al. (2018)	Whitworth et al. (2020)
1	0	0	0
2	0	0	0
3	1	1	1
4	0	0	0
5	0	0	0
6	1	1	1
7	0	1	0
8	1	1	2
9	0	0	1
10	1	2	2
11	2	2	1
12	2	1	2
13	0	2	1
14	0	1	2
15	0	2	0
	8	14	13

reflecting overall medium quality for external validity. The other three studies (those reporting on Cognitive Pragmatic Treatment; Bosco et al., 2018; Gabbatore et al., 2015; Parola et al., 2019) were group case series studies, with no control groups and, therefore, were rated with the Quality Assessment Tool for Before-After Studies with no control group. All three were rated as “Fair” according this measure. The ITAX taxonomy was used to evaluate the features of intervention reported. Using this framework, all studies reported on some delivery characteristics, such as mode, materials, and treatment schedule but not on scripting, sensitivity to participant characteristics, interventionist characteristics, and adaptability. Other components of the taxonomy, such as content and goals of the intervention, were described more fully in the studies by Whitworth et al. (2020) and Kintz et al. (2018) than in other studies. See Table 3 for details of the studies within this framework.

## Study participants

Reflecting the difference in participant numbers between individual and group therapy, studies using Cognitive Pragmatic Treatment had 10, 15, and 19 participants in each study (Bosco et al., 2018; Gabbatore et al., 2015; Parola et al., 2019); individual treatment studies involved a single case (Cannizzaro & Coelho, 2002), two participants with TBI (Whitworth et al., 2020), and three participants (Kintz et al., 2018). Location of brain damage due to TBI was noted only in one study (Cannizzaro & Coelho, 2002). Absence of aphasia was referred to in two studies (Cannizzaro & Coelho, 2002; Parola et al., 2019). Traumatic brain injury chronicity ranged from 6 months to more than 12 years postinjury, with severity levels of mild or mild to moderate TBI (Kintz et al., 2018; Whitworth et al., 2020), moderate to severe TBI (Parola et al., 2019), and severe TBI (Bosco et al., 2018; Cannizzaro & Coelho, 2002; Gabbatore et al., 2015).

## Treatment delivery and schedule

All treatments involved face-to-face delivery, individually (Cannizzaro & Coelho, 2002; Kintz et al., 2018; Whitworth et al., 2020) or in small groups of five to six (Bosco et al., 2018; Gabbatore et al., 2015; Parola et al., 2019). The three studies delivering individual intervention had moderate-intensity schedules, ranging from three to four sessions per week for 1–1.5 hr (Cannizzaro & Coelho, 2002; Kintz et al., 2018; Whitworth et al., 2020) over 5 weeks (Kintz et al., 2018) or 6 weeks (Cannizzaro & Coelho, 2002; Whitworth et al., 2020), although in the study by Whitworth et al. (2020), the schedule was not achieved for both participants with TBI, due to issues with scheduling, participant mood, and motivation level. The Cognitive Pragmatic Treatment program, delivered as group therapy, consisted of 24 sessions of 1-hr duration, twice weekly for 12 weeks, targeting various aspects of interaction, with one session specifically focused on narrative discourse production and other sessions

Table 3. Extracted data on narrative interventions

Population/ Participants (No., Severity, Chronicity)		Study Design	Brief Name	Outcome Measure	Type of Discourse Analysis	Targets	Treatment Content Strategies (What Does the Clinician Do?)	Intervention Stimulus Task and Materials	Schedule (No. Sessions; Times per Week, Duration of Overall Intervention)
Bosco et al. (2018)	19 Severe TBI At least 1 year postinjury	Small groups (5/6) A-B-A-B	CPT	ABaCo CADL-2 Neuropsychological tests	N/A; Standardized tests	For Narrative: Producing stories with an adequate amount of informa- tion.	Not explicitly stated for narratives, in CPT: Introduction to the topic Comprehension activities Production activities Conclusion Homework	Not clearly stated: single picture description (from DCT and/or WAB Picnic scene)	24 sessions 1.5 hr; 2 × week for 12 weeks 30 hr total Narrative = 1 × 1.5 hr session
Cannizzaro and Coelho (2002)	1 Severe TBI and right frontal skull fracture 12 years postinjury	Single case study A-B with main- tenance Three control subjects with no TBI	Treatment of Story Grammar	Story grammar Baseline sessions: No. of complete and incomplete episodes generated for 5 elicited stories. Outcomes measures: Retelling condition (episodes and components accurately identified). Generation condition (no. of complete and incomplete episodes per session)	Story grammar: % episodes and components accurately identified. Story generation: Complete and incomplete episodes	Story grammar: complete- ness (story- telling and story generation)	Story retelling: 5 training steps, using filmstrip/picture sequence to identify episodes and episode components Story generation: single pictures stimulus with four training steps to help generate of stories with multiple complete episodes	Story retell (from picture or pictures sequence) and story generation Baseline: Norman Rockwell pictures. Treatment: Story retelling (filmstrip stories or picture sequences) Story generation: pictures "comparable to those used in baseline"	Twenty sessions (but two of these nontreatment) 1-hr sessions, 3 × week, over 6 weeks 3 weeks per treatment (×2 treatment conditions)

(continues)

**Table 3.** Extracted data on narrative interventions (*Continued*)

Authors	Population/ Participants (No., Severity, Chronicity)	Study Design	Brief Name	Outcome Measure	Type of Discourse Analysis	Treatment		Schedule (No. Sessions; Times per Week, Duration of Overall Intervention)
						Content Strategies (What Does the Clinician Do?)	Intervention Stimulus Task and Materials	
Gabbatore et al. (2015)	15 Severe TBI At least 12 months postinjury	A-B-A-B	CPT	ABaCo Neuropsychological tests	N/A: Standardized tests	Pragmatic compe- tence as a whole (compre- hension and production)	Picture description tasks: single picture descriptions (DCT and WAB Picnic Scene, Norman Rockwell Pictures).	24 sessions 1.5 hr on narratives CPT: × 1.5 hr 36 hr total CPT
Kintz et al. (2018)	3 Mild-moderate TBI 6–130 months postonset	A-B with mainte- nance	DPT	Multilevel discourse analysis Primary: thematic Units: % per story Secondary: % correct words, speech rate and % global coherence errors	Micro- and macro-linguistic Multilevel discourse analysis Micro- and macro-linguistic- level errors examined. 1. Micro-linguistic (incorrect use of cohesive ties, missing/ ambiguous referents, filler utterances, repetition of utterances, conceptually incongruent utterances, and tangential utterances)	Two narrative tasks: picture sequences and personal narrative Description of story guide with six elements (setting, problem, internal response, action/plan, result, and resolution. Use of this to structure story. Five hierarchical steps with withdrawal of cues	Three tasks treated: sequential pictures, untreated sequential pictures, and generalization stimuli. Type not stated in paper, but in supplementary materials (refused umbrella; sequential four, six, and eight pictures). Story guide with setting, problem internal response, action/plan on A4 sheet with words, and pictures.	16 sessions 1 hr × 4 × week 5 weeks intervention + 2 maintenance (1 week and 1 month)

*(continues)*

Table 3. Extracted data on narrative interventions (Continued)

Authors	Population/ Participants (No., Severity, Chronicity)	Study Design	Brief Name	Outcome Measure	Type of Discourse Analysis	Targets	Treatment Content Strategies (What Does the Clinician Do?)	Intervention Stimulus Task and Materials	Schedule (No. Sessions; Times per Week, Duration of Overall Intervention)
Parola et al. (2019)	10 males Moderate to severe TBI At least 2 years postinjury	A-B-A-B	CPT	Baseline: 3 months pretreatment— ABaCo form A T1 1 week pretreatment: narrative task and ABaCo form B T2 1 week posttreatment: narrative task and form A. T3 3 months posttreatment (maintenance) form B	2. Microlinguistic analyses (% correct words produced and speech rate)	Informa- tiveness	For narratives: Description tasks (to elicit storytelling, providing an adequate amount of information)	Two single pictures: WAB Picnic Scene & BDAE The Cookie Theft	24 sessions 1.5 hr, 2 × week, over 3 months. In supplementary materials: one session for narrative, but suggested that other CPT sessions contributed to gains in narrative
(continues)									

**Table 3.** Extracted data on narrative interventions (*Continued*)

Authors	Population/ Participants (No., Severity, Chronicity)	Study Design	Brief Name	Outcome Measure	Type of Discourse Analysis	Treatment Content Strategies (What Does the Clinician Do?)		Intervention Stimulus Task and Materials	Schedule (No. Sessions; Times per Week, Duration of Overall Intervention)
						Targets	Participants introduced to story framework to organize narrative, progressing to more demanding genres (e.g., scrambling eggs) recount of events, procedural discourse, exposition).		
Whitworth et al. (2020)	2 females Mild to moderate TBI (and two with stroke) 9-15 months postinjury	Prospective case series A-B-plus main- tenance	NARNIA	Multilevel discourse analysis 1. Discourse organization (macrostructure) in everyday discourse 2. Significant changes in the quantity (total correct information units [CIU], informativeness (% CIUs) and efficiency (CIUs/min) of everyday discourse tasks 3. LCQ (participant and other perceived change)	Microlinguistic Macrostructural (story grammar) 1. Number of orientation elements (beginning) 2. Number of body elements (middle) 3. Number of conclusion elements	Quantity Informativeness Efficiency	Participants introduced to story framework to organize narrative, progressing to more demanding genres (e.g., scrambling eggs) recount of events, procedural discourse, exposition). Sessions supported by video materials (narratives), picture sequences (procedures), and single picture (opinions). Participants identified main event, accessed verb and nouns, and created verb argument for each event. Use of mind maps used as scaffold.	Three task types: 1. Three recounts (personal events) 2. Three procedures (changing a light bulb, planning a meal/event, scrambling eggs) 3. Three expositions (global warming, bullying, and obesity) 4. Narrative (Cinderella story). Framework for narratives Initial topics were supported by video material (narratives), pictorial sequences (procedures), or stimulus scenes (opinions), with cues withdrawn over treatment	20 sessions 45 min to 1 hr over 6 weeks

*Note.* ABaCo = Assessment Battery for Communication; BDAE = Boston Diagnostic Aphasia Examination; CADL-2 = Communication Activities of Daily Living-2; CPT = Cognitive Pragmatic Treatment; DCT = Discourse Comprehension Test; DPT = Discourse Processing Treatment; LCQ = La Trobe Communication Questionnaire; LIUs = lexical information units; N/A = not applicable; NARNIA = Novel Approach to Real life communication: Narrative Intervention in Aphasia; TBI = traumatic brain injury; WAB = Western Aphasia Battery.

targeting component skills for effective discourse production. See Table 3 for details on treatment schedules.

### **Measurement of narrative discourse outcomes**

Several discourse outcome measures were used, including measures of impairment, participation, and function. Cannizzaro and Coelho (2002) measured complete and incomplete story grammar episodes, comprising beginning, middle, and end. Kintz et al. (2018) used both macro- and microlinguistic measures. Their primary measure was thematic units (overall informativeness and completeness of discourse), and their secondary measures were with percent correct words, speech rate, and global coherence. Whitworth et al. (2020) included micro- and macrolinguistic measures (story grammar, informativeness, quantity, and efficiency of stories), the LCQ to measure self- and close other perceptions of communication function, and the Sydney Psychosocial Reintegration Scale Version 2 (SPRS-2; Tate et al., 2011) to measure psychosocial function. The three studies using Cognitive Pragmatic Treatment (Bosco et al., 2018; Gabbatore et al., 2015; Parola et al., 2019) used the Assessment Battery for Communication (ABaCo; Angeleri et al., 2008), which examines areas of communication across four scales: linguistic, extralinguistic, paralinguistic, and context. The context scale of the ABaCo evaluates discourse-level communication acts according to Gricean maxims (Bosco et al., 2018). In addition to the ABaCo, Bosco et al. (2018) used Communication Activities of Daily Living-2 (CADL-2; Holland et al., 1999) to examine functional communication outcomes following treatment. Parola et al. (2019) also measured informative skills in discourse production as an outcome measure of the Cognitive Pragmatic Treatment program, with percentage of lexical information units per storytelling. However, narratives were assessed at baseline and posttherapy only and were not included in follow-up measures 3 months after treatment.

### **Research Aim 1: Effectiveness of intervention**

These reported effects of discourse intervention in these studies were equivocal. Cannizzaro and Coelho (2002) reported that the participant who received story grammar treatment demonstrated gains on measures during the intervention period, but this was not maintained at follow-up 3 months posttherapy. They noted that the participant's increased scores on measures of completeness in discourse production following therapy did not reflect higher quality of narratives, which were described as "heap or sequence" (e.g., listing items in the picture) rather than an interpretive and integrative account of the story depicted. Participants treated with DPT (Kintz et al., 2018) made small to moderate increases on completeness and informativeness measures of narrative discourse, which were maintained at follow-up 1 month after completion of therapy. Other measures in this study (e.g., percentage of correct words, percentage of global coherence errors) did not uniformly indicate increased skills from treated to nontreated items, nor did they demonstrate maintenance of therapy gains at follow-up. Similarly, the two participants with TBI in the study by Whitworth et al. (2020) who received the NARNIA treatment program demonstrated increased scores on some measures (e.g., quantity of output: total correct information units), but other measures did not uniformly indicate improvement (informativeness: percentage of correct information units, and efficiency: correct information units per minute), and no participants improved on macrostructure, as measured by increased number of story structure elements (specified as orientation, body elements, and conclusions).

For all studies using Cognitive Pragmatic Treatment, there was a general increase in ABaCo scores rating cognitive pragmatic performance, which was maintained at 3-month follow-up. In the study by Bosco et al. (2018), all participants were reported to have higher percentage scores on the CADL-2, indicating

better communication effectiveness. The study by Parola et al. (2019) was the only one with a stated focus on the narrative component of the intervention, and discourse measures were taken pre- and postintervention only, with no follow-up measure. They reported that postintervention, narrative scores for the group ( $n = 10$ ) increased in informativeness, as rated by a significantly higher percentage of lexical information units.

## **Research Aim 2: Rationale and theory for elements of the intervention**

All studies reported on the rationales supporting the intervention. Whitworth et al. (2020) explained that NARNIA is based on Levelt's language production theory (Levelt, 1989). According to this theory, narrative discourse requires integration of language and cognitive processes in order to organize an underlying structure (with sequence of events) while monitoring and integrating listener response. The NARNIA protocol used traditional learning theory, with a metacognitive and metalinguistic approach and a structured, scaffolded framework to increase story competence. Authors reported making adaptations to the previous NARNIA program to address issues related to cognitive communication impairment, using self-regulation and errorless learning.

Cognitive Pragmatic Treatment is based on cognitive pragmatic theory, which is also focused on the cognitive and inferential processes supporting interactional discourse. In cognitive pragmatic theory, executive function, theory of mind, and inferential processes are viewed as critical for competent communication. Therefore, the program prioritizes teaching the meaning of the various communicative acts (both spoken and non-linguistic). Cognitive pragmatic theory also directly informs the assessment tool (the ABaCo), used as an outcome measure in these studies.

There was limited discussion of theory in the article by Bosco et al. (2018), but the authors stated that the rationale for intervention was based on theory of mind, and they

suggested that increasing participants' inferential ability would transfer to generalized improvements across areas of communication as measured with the ABaCo. Parola et al. (2019) related cognitive pragmatic theory to narratives more directly, stating that pragmatic skills set the context within which narratives are generated.

The theory behind DPT was not discussed in detail in the article by Kintz et al. (2018), but information was provided in other DCT publications. Authors based DPT on the rationale supporting Hierarchical Discourse Treatment (Penn et al., 1997). Henderson (2019) explained that knowledge of discourse schemas is essential to understanding and producing a narrative (i.e., one needs to understand the overall topic and identify salient information in order to structure a story logically to report to others). The DPT intervention teaches the structure of narratives and hierarchical strategies for improving production skills. Cannizzaro and Coelho (2002) made the association between story schemas and the frontal lobes for integrating cognitive and linguistic processes as the mechanism for targeting narrative discourse knowledge and production.

## **Research Aim 3: What were the active components of the therapy?**

Treatments universally incorporated metacognitive and metalinguistic components, that is, understanding what makes a good story and delineating how cognitive factors affect narrative production. In all studies, intervention involved recognition of story components, using a guide or framework for teaching the participants about required elements. Both Kintz et al. (2018) and Whitworth et al. (2020) described a hierarchical approach based on learning the structure of a good narrative and gaining skills in production, with decreasing cues or scaffolds over the intervention period.

Discourse Processing Treatment intervention in the study by Kintz et al. (2018) used structured cues in the form of comprehension questions, a story guide for the

narrative, supported by use of metacognitive and metalinguistic strategies to practice narrative production. The story guide contained six story organizational categories similar to those used in story grammar analysis (see Stein & Glenn, 1979). Structured comprehension cues included both simple and more abstract questions about the picture sequence. Cannizzaro and Coelho (2002) had the specific aim to investigate teaching story grammar elements through two treatment conditions: a story retelling condition that required the participant to retell a story from film strips and a story generation condition where the participant was presented with pictures and was required to generate a story. Their intervention for the narrative retell condition involved guiding the participant through a series of five training steps to facilitate episode identification, with the gradual fading of prompts. The intervention for the story generation component also involved a guided training process with four steps that facilitated the participant to generate multiple complete episodes for the narrative.

As part of a wider communication training program, Cognitive Pragmatic Treatment provided few details about the specific task elements used during the single session for narratives. In general, the Cognitive Pragmatic Treatment program involved introduction to topic, demonstration of communication features, practice in production of targeted area, and homework. From information provided by Parola et al. (2019), it appeared that the focus of the narrative intervention session was in educating participants on how to structure a narrative and on components of a successful narrative production (i.e., adequate amount of information, relevance of information and topic, and awareness of communication partner).

Materials used in five of the interventions (Bosco et al., 2018; Cannizzaro & Coelho, 2002; Gabbatore et al., 2015; Kintz et al., 2018; Parola et al., 2019) involved picture sequences and/or single pictures, presented as paper copies or on a computer screen. In three studies, details on specific ma-

terials appeared in supplemental materials (Gabbatore et al., 2015; Kintz et al., 2018; Parola et al., 2019). For those studies, intervention stimulus materials included Norman Rockwell pictures (Cannizzaro & Coelho, 2002; Gabbatore et al., 2015), pictures stimuli from the Discourse Comprehension Test (Bosco et al., 2018; Brookshire & Nicholas, 1997; Gabbatore et al., 2015), the Picnic Scene picture description task from the Western Aphasia Battery (Bosco et al., 2018; Gabbatore et al., 2015; Kertesz, 2006; Parola et al., 2019), the Cookie Theft picture description (Goodglass et al., 2001; Parola et al., 2019), the Refused Umbrella picture sequence (AphasiaBank; <http://aphasia.talkbank.org/>; Kintz et al., 2018), and film strip and picture sequence with content not stated (Cannizzaro & Coelho, 2002). Whitworth et al. (2020) supported discourse topics during intervention with video material as well as single or sequential pictures.

### **Treatment content strategies: What did the clinician do?**

A common feature of all interventions was teaching participants the structure and elements required in a story, or metalinguistic knowledge of the narrative. Cannizzaro and Coelho (2002) described this process across two narrative production conditions, storytelling and story generating. Participants were shown film strips or picture sequences and trained to identify story elements in five training steps. In the story generation condition, there were four training steps to help generate stories with multiple episodes. In the DPT program (Kintz et al., 2018) a five-step hierarchical treatment involved participants initially being shown picture sequences and responding to simple and more abstract questions (e.g., the state of mind of story characters). Next, the participant was recorded during a storytelling attempt with prompts. Following this, the clinician and the participant reviewed the story together, evaluating quality, and the clinician discussed what was required to improve the participant's narrative. Finally, the story guide was removed,



and the participant was asked to retell the story after the feedback from previous steps. For the Cognitive Pragmatic Treatment program, the clinician introduced the topic in each session and engaged the participants in comprehension activities. This was followed by practice in production of the skill taught in the session, with home practice of this skill focus provided. Specific to the narrative session of Cognitive Pragmatic Treatment, the clients were trained in how to tell a story or describe a situation, giving the right amount of information (Gabbatore et al., 2015). The NARNIA program involved recognition of discourse elements, practice using planning and mind maps, self-rating to support clinician feedback, and use of self-monitoring (Whitworth et al., 2020).

## DISCUSSION

This study aimed to systematically review current evidence for narrative discourse intervention after TBI to guide SLP practice and inform future research directions. While discourse therapy is recommended for people with TBI given that this is the level of cognitive communication breakdown (Coelho, 2007), the extent of research evidence for this topic remains limited. This is due to the small number of studies, which are primarily nonexperimental case studies or group studies with no control group and small or varied effect sizes, with the methodological quality of the included studies ranging from very low to fair. Of the 519 studies screened in the literature search, only six studies met criteria. Of these, three were single case studies using individual treatment and three were group studies delivering intervention in small groups. Since Coelho's (2007) review on discourse management, it is positive to note increased reporting relating to the theoretical basis for discourse-based treatments.

All studies reported gains on some measures following discourse treatment, but with mixed results concerning generalization and maintenance of effects. Parola et al. (2019) reported higher scores for informativeness

(percentage of lexical information units) on the narrative discourse task following Cognitive Pragmatic Treatment intervention but did not measure the narrative at follow-up 3 months later. A key limitation identified by this review was minimal reporting of generalization to nontreated discourse and evaluation of benefits to the participants' narrative use in everyday life.

The four therapy approaches used in the six studies reviewed here shared some common features that, based on the findings, appear to have the most potential: the use of structured frameworks and metacognitive and metalinguistic approaches. For example, the treating clinician would guide the participant through a series of training steps and provide prompts, cues, and scaffolding as necessary. The treatment would also involve recording and playback of the participant's narrative, followed by guided discussion regarding the narrative elements to facilitate awareness of cognitive and linguistic performance.

## Relevance of TBI-related factors on narrative intervention

The articles included in this review provided possible explanations for the lack of significant gains following intervention, particularly when the program (e.g., NARNIA) was successful with other clinical populations at the macrostructural level, for example, with people with aphasia (Whitworth et al., 2015) and primary progressive aphasia (Whitworth et al., 2018). Some reasons related to features of TBI, namely the impact of cognitive impairments (e.g., attention, memory) on the learning process (Whitworth et al., 2020) and the chronicity of cognitive communication impairment (Cannizzaro & Coelho, 2002). Kintz et al. (2018) discussed the potentially confounding performance effects of fatigue and sleep disturbance, common after TBI. Another issue involved the materials and task type used in the intervention, relative to generalization of intervention effects. Cannizzaro and Coelho (2002) suggested that their use of a decontextualized treatment may have

contributed to poor transfer of treatment gains to nontreated, real-life storytelling situations. The discrepancy between therapy targets and generalization measures was also raised by Kintz et al. (2018), who discussed treating narratives using sequential pictures (with embedded story scaffolding) in therapy and then measuring generalization using single pictures or recount tasks.

People with TBI may have difficulties adhering to a treatment schedule and dose because of TBI-related mood issues, or they may have competing rehabilitation schedules and other service delivery factors (Whitworth et al., 2020). These issues may have less influence on treatment schedules for other clinical populations who are better supported in rehabilitation. Despite these factors, numerous cognitive and communication interventions have been effectively implemented with adults with TBI (see Meulenbroek et al., 2019), and, therefore, addressing these issues should be prioritized in the design of future narrative intervention research.

### **Issues with tasks and materials for narrative discourse assessment, treatment, and outcome**

This review has highlighted problems with stimulus materials, tasks, and outcome measures used for narrative discourse. In accordance with issues reported in aphasia literature (Bryant et al., 2016; Bryant et al., 2017; Dipper et al., 2020), there is a wide variety of materials and measures used for discourse after acquired brain injury. The range of stimulus materials, analyses, and outcome measures used by different research groups makes it difficult to compare studies, and this hinders the evidence base for any particular approach. Even with the focus on narrative discourse intervention for TBI and the strict inclusion criteria narrowing our review to six studies, it was not possible to conduct a meta-analysis or directly compare interventions due to the range of assessment tasks, analyses, outcome measures and methods used in interventions. One solution to increase the evidence base and enable comparative

research involves the consistent use of standardized discourse elicitation protocols, as in the NARNIA studies (using the Curtin University Discourse Protocol), the TBIBank protocol (<https://tbi.talkbank.org>), or the Mediated Discourse Elicitation Protocol (MDEP; see Steel & Togher, 2018). Similarly, studies in this review reported on a range of analysis types, from microlinguistic measures to superstructural analyses, suggesting a lack of consensus on what should be prioritized when measuring TBI narrative quality. In general, multilevel analyses of narratives including examination of content, organization, and structure were used as common outcome measures.

This review also identified issues with validity and salience of tasks used for both assessment and treatment. Establishing ecological validity of assessment materials for discourse after TBI is a well-documented challenge. This was highlighted by Whitworth et al. (2020), who discussed the difference between tasks that occur in everyday output (e.g., recounting an event) and tasks that are less likely to occur every day (e.g., retelling an interview-style narrative such as Cinderella). In many cases, narrative discourse tasks used in assessment are short, highly structured, and unrelated to real-life experiences (Body & Perkins, 2004), often comprising short picture sequences or single pictures as a stimulus for a narrative recount or story generation. While structured story guides, as used in picture sequences, may have a role in therapeutic activities for the person with TBI, these may have little relevance to the skills needed to recount an actual event or to support skills needed to tell an anecdote and, therefore, lack validity as outcome measures. However, less structured tasks that are more personally relevant (e.g., the Injury Story or Important Event from the TBIBank protocol) can be difficult to standardize and scaffold. Further research is needed to evaluate which discourse tasks stimuli are best suited for assessment (including outcome measures) versus which discourse tasks are best suited for inclusion as treatment stimuli.

Increased use of real-life materials as the treatment stimuli may encourage transference and generalization to functional ability (Togher et al., 2014).

Only one study in this review (Bosco et al., 2018) included a measure of functional communication, the CADL-2. No other study evaluated functional discourse use as part of outcome measurement, and only the NARNIA program included measures of narrative use in more contextualized environments, where tasks resembled everyday-speaking situations. Whitworth et al. (2020) included a measure of psychosocial function (SPRS-2), which is recommended for use in quantifying social functioning gains.

The INCOG guidelines for adults with social communication impairments after TBI specify the need for contextually relevant interventions with inclusion of communication partners (Togher et al., 2014), and therefore these factors should be included in future intervention research. For example, as pre- and postintervention measures, narrative discourse could be evaluated during jointly produced storytelling interactions with everyday communication partners or as part of conversational interactions rather than the traditionally used monologic samples (Bogart et al., 2012; Jorgensen & Togher, 2009). This would provide a more meaningful measure of change after intervention. In addition, as noted by Cannizzaro and Coelho (2002), existing discourse measures used in research may not adequately reflect the listener's qualitative perceptions of improvement in storytelling, despite registering as gains on impairment-based intervention measures. These issues in capturing change in discourse after TBI continue to challenge both researchers and clinicians (Steel & Togher, 2018).

### Directions for the future

The small number of research studies reporting on discourse intervention approaches after TBI presents a clinical dilemma. There is limited guidance available from directly relevant research for SLPs seeking evidence to support clinical practice with

people with TBI. Published research with other clinical populations may yield potentially relevant and feasible narrative interventions that might be adaptable for use with people with TBI, albeit with consideration of the TBI-specific issues listed previously and the need to target macrostructural skills (e.g., story episodes) rather than word-level skills (e.g., naming) in therapy.

There are approaches used for discourse therapy with aphasia that may be suitable to use for people with TBI. The LUNA (Language Underpins Narrative in Aphasia) research group has reported on narrative discourse intervention for adults with aphasia after stroke (Dipper & Cruice, 2018). In a single case study, a client with chronic aphasia poststroke worked on a personal narrative at the word, sentence, and discourse level (Dipper & Cruice, 2018), making gains in treated and untreated narratives. Similarly, Carragher and colleagues have reported on a storytelling intervention for people with aphasia, both face-to-face and within a virtual environment (Carragher et al., 2015, 2018). Stimulus materials in the 2015 study included interactive storytelling using wordless YouTube videos, rather than printed picture sequences. In view of the previously reported issues with stimulus materials for people with TBI, these tasks may be more acceptable and subsequently generalizable to use in narrative discourse interventions after TBI.

Another potential direction for inclusion of personally relevant discourse generation genres might be personal narrative work, previously reported in psychological rehabilitation for people with TBI in the literature (D'Cruz et al., 2019, 2020). Personal narratives have benefits as both an advocacy tool and therapeutic process (D'Cruz et al., 2020) and have been widely used to treat children with communication disorders (Petersen, 2011) and adults with aphasia (Ulatowska et al., 2013). To date, the majority of literature on personal narratives after TBI has focused on the psychosocial benefits, but this genre could have dual benefits of improving the person's ability to tell their story of injury and of working on narrative structure

in a more personally salient way. In previous literature, people with TBI have found it beneficial to tell their injury story as an important life event (Fraas, 2015). This narrative type has been used in the TBIBank discourse protocol and to measure recovery in research (Elbourn, Kenny, Power, Honan et al., 2019; Steel et al., 2017). A similar task may be useful for intervention. Other tasks and materials that could be investigated include videos or photographs from the person's life to support their recall of narratives for retelling.

A number of recent evidence-based social communication programs for people with TBI, although not eligible for inclusion in this review, potentially incorporated treatments for the person's narrative discourse within the structure of the program, although these details are not reported in studies. These include goal-based interventions (e.g., Finch et al., 2017) and project-based interventions (Behn et al., 2019a) where narrative discourse skills may be selected as a personal goal of the person with TBI. For example, the IMPACT program (Copley et al., 2019) incorporates a story-building group task within the program, although this does not target the macrostructure of a narrative specifically. The TBI express (Togher, McDonald et al., 2010) and TBI Connect programs (Rietdijk et al., 2019) have modules within the program on conversational roles, which could include elements of how to tell stories effectively. In summary, existing social communication programs for people with TBI may include treatment components that address narrative discourse as part of personal goal setting with the client. The lack of a data-based foundation to address the efficacy of narrative discourse treatments for people with TBI highlights the need to determine the optimal treatment stimuli, dosage, and frequency for each patient.

### **Recommendations based on current evidence**

Based on the findings of this systematic review and available guidelines for the man-

agement of adults with social communication difficulties after TBI, the following recommendations are provided. There is a clear need for further empirical evidence for efficacy of narrative discourse intervention, with development of a pilot RCT evaluating the effectiveness of a novel narrative discourse intervention for individuals with TBI. Aligned with INCOG guidelines, this should include the following:

1. Assessment and outcome measures that are ecologically valid and sensitive to measuring changes in discourse.

As discussed in this study and highlighted in previous research (Snow & Douglas, 2000; Steel & Togher, 2018), further work is required to identify measures to use for assessing and measuring change in discourse of people with TBI. These measures should be sensitive for detecting cognitive communication disorders within narratives (e.g., macrostructural- and superstructural-level analyses); repeatable for ongoing monitoring; and salient and appropriate for the clinical population, a high proportion of whom may be young males. Balancing the need for standardization of measures for consistency and comparison across studies as well as personal relevance and validity remains a priority for future research. Participation and engagement in social interactions should be a key factor in measurement of client outcomes for narrative discourse therapy; therefore, these constructs should be measured with tools such as the Communication Effectiveness Index (Lomas et al., 1989) or the Lubben Social Network Scale (Lubben et al., 2006). Self and other measures, such as the LCQ as used in the study by Whitworth et al. (2020), are recommended to measure the impact of intervention on interactions from these different perspectives.

It is recommended that intervention and outcome measures should incorporate more personally relevant materials, which may improve client motivation, engagement, and ultimately better generalization of therapy gains to real-life functioning for the person

with TBI. It is therefore suggested that stories and tasks used in therapy mirror more closely those in use by the person with TBI.

2. Incorporation of metacognitive and metalinguistic strategies in narrative interventions.

These strategies form part of general INCOG recommendations as a basis for interventions after TBI (Tate et al., 2014). The theoretical basis for using metacognitive and metalinguistic strategies is well supported, and use of these underpins narrative intervention in other clinical populations (Schiff & Joshi, 2016). In particular, teaching metalinguistic knowledge of narrative structure and elements is recommended for a narrative-based intervention.

3. Supports should be provided for cognitive impairments (attention, memory) and behavioral challenges (e.g., fatigue, sleep disturbance) present after TBI.

In view of the frequency of these issues for people after TBI, and the impact of these issues on the learning process during intervention (Ponsford et al., 2012), supports for impairments in attention, memory, and other cognitive impairments (e.g., minimizing distractions, memory aids, goal management training principles, structured rest breaks) should be incorporated into narrative intervention design and considered throughout intervention programs (Wiseman-Hakes et al., 2013). These common impairments after injury have an impact on service delivery, client motivation, and subsequent adherence to therapy programs (Whitworth et al., 2020).

4. Opportunities should be available for self-evaluation and development of self-regulation within discourse-based tasks.

Increasing self-regulation is a rehabilitation standard for people with TBI, one of the key recommendations of the INCOG group (Tate et al., 2014), and is a typical component of social communication level interventions (Meulenbroek et al., 2019). Strategies for increasing self-evaluation could include video

self-modeling (Hoepner & Olson, 2018) and use of self-rating scales such as the LCQ more widely within intervention programs.

5. Potential for inclusion of communication partner training.

Narratives do not occur in isolation in real-life but rather as an integral part of conversations and reciprocal social interactions (Norrick, 2000). Therefore, practice of narratives should occur in contextually relevant settings, as a component part of the broader conversational field. While there are many examples of conversation and social skills interventions, there is currently no reported intervention in which narratives are the target within the context of conversation. Communication partner training has been shown to be effective in improving conversational discourse in TBI (Behn et al., 2021) and has the potential for use in monologic tasks, with the advantage of increased opportunities for the person with TBI to practice skills in real-life, naturalistic contexts. As yet, the capacity of communication partners to contribute to narrative skill building has not been investigated in TBI literature.

6. Potential for adaptation to group and telehealth settings across the continuum of care.

Recent research into cognitive communication intervention after TBI has increasingly incorporated telehealth into treatment approaches, reflecting the multiple benefits that this mode of service delivery has for the clinical population (Rietdijk et al., 2020). Similarly, group-based delivery encourages use of interaction skills in a more natural context than do one-to-one patient-provider contexts.

Finally, it is recommended that future research, whether experimental single case study or controlled trial, should incorporate stronger methodological design. Use of fully powered studies would also strengthen the level of evidence for narrative discourse treatment.

## CONCLUSION

Narratives form a key part of social communication, which is an immensely complex and dynamic activity. Having the skills to tell an organized, informative story that a communication partner is able to follow and understand contributes greatly to successful interaction, whether the story is for everyday

information exchange or about an important life event. Helping people with TBI to succeed with this important component of social interaction is an area requiring more work. Specifically, more focused and carefully designed research is needed to determine the effectiveness of narrative discourse intervention after TBI.

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