Journal of Communication Disorders 76 (2018) 47–59

Contents lists available at ScienceDirect

Journal of Communication Disorders

journal homepage: www.elsevier.com/locate/jcomdis

Discourse-based treatment in mild traumatic brain injury

Stephen Kintz*,[1], Valentyna Hibbs, Amy Henderson, Morgan Andrews, Heather Harris Wright

East Carolina University, Greenville, NC, USA

ARTICLE INFO

Keywords:
Traumatic brain injury
Discourse
Treatment
Language
Cognition

ABSTRACT

Background: Individuals with traumatic brain injury (TBI) present with numerous discourse deficits associated with impairments to the linguistic system and other cognitive systems. Individuals with TBI may produce discourse that is lacking important information and poorly organized, as well as containing numerous coherence disrupting elements. Yet there are few studies directly addressing discourse deficits in individuals with TBI to guide clinicians.

Aims: The purpose of the study was to determine if discourse processing treatment improved the discourse production in individual with TBI. Aims of the study included determining if the discourse processing treatment improved completeness and informativeness in TBI discourse samples.

Methods & procedures: The study included three participants with mild-to-moderate TBI. The study utilized an A-B with maintenance design that incorporated components of functional practice, structured cues in the form of comprehension questions and story guide, and metacognitive and meta-linguistic processes. Discourse samples were obtained for baseline, treatment, and maintenance one-week and one-month post treatment. Stimuli included 12 sequential pictures, as well as a single picture and a recount probe.

Outcomes & results: All participants demonstrated small gains in completeness and informativeness for treated items, and 2 of 3 participants demonstrated a medium therapeutic effect for untreated stimuli. Participants also produced discourse with fewer errors for both treated and untreated stimuli after treatment with no therapeutic effect to a small effect for the generalization stimuli.

Conclusions: The study demonstrated that the discourse processing treatment is capable of producing small therapeutic effects that persisted one-month post treatment in adults with mild-to-moderate TBI.

1. Introduction

Individualswith traumatic brain injury (TBI) without aphasia still present with cognitive-communication impairments that contribute to feelings of frustration and social isolation (Coelho, 1995, 2007; Hagen, 1984; Le, Mozeiko, & Coelho, 2011). These impairments include possible disruptions to the linguistic system (Ellis & Peach 2009; Peach, 2013), as well as other cognitive systems, such as episodic memory, executive function, and working memory (McCullagh & Feinstein, 2011). A hallmark of these

* Corresponding author at: College of Education and Health Professionals, Department of Audiology and Speech Pathology, University Plaza, Suite #600, University of Arkansas at Little Rock, Little Rock, AR 72204, USA.
E-mail address: sgkintz@ualr.edu (S. Kintz).
[1] Work completed while at ECU, now affiliated with University of Arkansas.

https://doi.org/10.1016/j.jcomdis.2018.08.001
Received 11 December 2017; Received in revised form 27 July 2018; Accepted 7 August 2018
Available online 18 August 2018
0021-9924/

cognitive-communication impairments is a disruption to discourse (Biddle, McCabe, & Bliss, 1996; Hagen, 1984; Le et al., 2011). Discourse is defined as any language beyond isolated utterances (Gee & Hartford, 2012; Ulatowska & Olness, 2004), and it requires a complex interaction between the linguistic system and other cognitive systems (Kemmerer, 2015; Ylvisaker, Szekeres, & Feeney, 2001). Ska, Doung, and Joanette, (2004) suggested that discourse is one of the most cognitively complex linguistic activities performed. Therefore, it is not surprising that individuals with TBI suffer from discourse impairments related to disruptions in the linguistic and other cognitive systems (Ellis & Peach, 2009; McCullagh & Feinstein, 2011). The discourse for individuals with TBI is often described as "confused" (Hagen, 1984, p. 246) or less informative (Glosser & Deser, 1990). Moreover, measures of discourse abilities are related to measures of social integration (Snow, Douglas, & Ponsford, 1999) and work status (Brooks, Campsie, Symington, Beattie, & McKinlay, 1987). Sale, West, Sherron, and Webman, (1991) found that communication problems and inappropriate vocalization were common reasons for individuals with TBI to lose their job. Despite the impact that discourse impairments have on a person's day-to-day life, only a few studies have investigated discourse treatments in individuals with TBI (Cannizzaro & Coelho, 2002; Penn, Jones, & Joffe, 1997). This leaves clinicians with "little empirical evidence to guide therapeutic intervention of discourse deficits" (Coelho, 2007, p. 127).

Individuals with TBI without aphasia still present with impairments to both micro- (within utterance) and macrolinguistic (between utterances) processes in discourse (Coelho et al., 2005; Ellis & Peach, 2009; Galetto, Andreetta, Zettin, & Marini, 2013; Hinchliffe, Murdoch, & Chenery, 1998; Peach, 2013). For microlinguistic impairments, the research has been mixed. Glosser and Deser (1990) found that individuals with a TBI had similar syntactic complexity compared with healthy controls. These results have been replicated (Marini et al., 2011; Cannizzaro & Coelho, 2002). Peach and Schaude (1986), as quoted by Ellis and Peach (2009), found similar syntactic complexity between individuals with TBI and healthy controls, but the TBI group did have an increase in the number of syntactic errors (i.e. word transpositions and tense and agreement errors). Researchers have also found that individuals with TBI have a reduced number of propositions per utterance (Coelho et al., 2005) and reduced fluency (Biddle et al., 1996). Therefore, individuals with TBI without aphasia are producing utterances with similar length and complexity, but the utterances contain less information and are produced at a slower rate.

For macrolinguistic impairments, findings are more consistent. Individuals with TBI present with macrolinguistic impairments to discourse (Coelho, 1995; Marini et al., 2011). Individuals with TBI have difficulty in managing and organizing the semantic content during discourse production (Brookshire, Chapman, Song, & Levin, 2000; Galetto et al., 2013; Glosser & Deser, 1990; Le et al., 2011; Marini et al., 2011). This includes omissions of critical information and relevant details (Biddle et al., 1996; Marini et al., 2011) which leads to stories that are often incoherent and difficult to understand. Galetto et al. (2013) and Marini et al. (2011) conducted a multilevel error analysis on the narrative discourse samples of individuals with TBI. They discovered that individuals with TBI produced more global coherence errors, such as tangential utterances, which were not relevant to overall topic, as well as conceptually incongruent utterances, which did not conceptually match the stimuli. These types of global coherence errors put further cognitive strain on the listener, who must filter through the tangential information and search long-term knowledge to fit the conceptually incongruent information into the overall representation of the narrative (Kintsch & van Dijk, 1978). Individuals with TBI are presenting with discourse that includes omissions of relevant information and an increase in both off-topic utterances and conceptually incongruent utterances.

Despite these impairments, treatments rarely focus on discourse. Cicerone et al. (2005) conducted a review on cognitive rehabilitation and found 118 articles between 1998 and 2002. For neurogenic communication disorders, the researchers found 40 studies that targeted language. Yet only seven studies included individuals with TBI. Cicerone et al. concluded that cueing and semantic analysis techniques improved naming in aphasia and TBI, and there is some evidence that group therapy improved pragmatic skills (Wiseman-Hakes, Stewart, Wasserman, & Schuller, 1998) necessary for discourse. Rohling, Faust, Beverly, and Denmakis, (2009) also conducted a review study, which re-examined Cicerone and colleagues' 118 articles. The researchers reported weak or small effect size, ES = .27, for language-based therapies on individuals with TBI; and, they found modest evidence for language therapies positively effecting other cognitive domains for all individuals with an acquired neurogenic disorder.

Whereas Cicerone et al. (2005) and Rohling et al. (2009) reviews are positive, they highlight two problems associated with cognitive-communication therapies targeted to individuals with TBI. First, there are few studies targeting language in individuals with TBI without aphasia (Coelho, 2007) despite the evidence that language impairments disrupt the daily lives of individuals with TBI (Brooks et al., 1987; Sale et al., 1991; Snow et al., 1999). Second, the few studies available primarily focus on cueing and naming therapies. According to Prigatano (2011), cognitive rehabilitation therapy is most effective when the therapy is "contextualized. . . to real-life problems. . . ." (p. 582). Therefore, discourse treatment is important because it represents a more functional and natural cognitive-linguistic task than cueing and naming therapies, and it may generalize to other cognitive domains better than other language interventions because of discourse's interaction between the linguistic and other cognitive systems.

The research on the effectiveness of discourse interventions is mixed (Cannizzaro & Coelho, 2002; Penn et al., 1997; Youse & Coelho, 2009). Penn et al. (1997) conducted a discourse treatment program based on the Strategies of Observed Learning Outcomes (SOLO) taxonomy created by Biggs and Collis (1982). The SOLO taxonomy allows researchers to determine the level of comprehension displayed by a participant's response to a series of question. These questions are designed to target a taxonomy of comprehension that includes five levels. First level responses are considered to have "no logical interrelation between question and answer," while fifth level responses have "elaboration and extrapolation" (Penn et al., 1997, p. 603). The study included one participant with anomic aphasia from a stroke and one participant with a TBI resulting from a closed-head injury at 19 years old from a car accident 8 months prior to treatment. The treatment program was an A-B -A design and included 15 sessions that consisted of participants answering questions to stimuli (e.g. letters, expository text, pictures, and poems) as they navigated through the visual stimuli. Both participants completed a series of tasks pre- and post-treatment. Once the baseline SOLO level for each participant was