Poster presented at the American Speech Language Association Convention, Nov. 2023, Boston MA

8215L Screen 165 – Gauging the Effects of Traumatic Brain Injury on Dyadic Conversations

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INTRODUCTION

• Persons with TBI often exhibit impairments in discourse, pragmatics, and conversations. Impairments may cause difficulty re-integrating into work and social settings.

• We explore a straightforward technique for examining one aspect of conversation:

How pronoun use characterizes the interdependent performances of two individuals engaged in conversation.

• Coelho, Youse, & Le (2002) report a linguistic analysis of conversations that do or do not include a person with TBI as one of two individuals. Coelho et al. show that maintaining a conversation with a person with TBI requires more work, such as posing direct questions that obligate the other person to respond.

• The Coelho et al. conversation transcripts are posted to https://tbi.talkbank.org/access/English/Coelho.html.

Method

PARTICIPANTS

• Coelho et al. (2002) specify a 42-year old male speech language pathologist for all participants.

• Usable transcripts were obtained for 48 persons with TBI and for 48 persons without TBI.

DESIGN, PROCEDURE AND DATA PREPARATION

• Conversations involved a speech-language pathologist and one other unfamiliar individual, either a person with TBI or a neurotypical person.

	TBI	Control
N	48 (13 female)	48 (16 female)
Age	29.3 (SD: 12.9, range: 16-69)	31.4 (SD:13.2, range: 16-63)
Education	13.2 (SD: 2.5, range: 9-21)	14.0 (SD:3.0, range: 11-22)
Months Post injury	10.8 (SD: 18.6, range: 1-99)	
Days in coma (N=41)*	15.5 (SD: 23.1, range: 0-99)	

Demographic Information

• Transcripts of approximately 10 minutes of conversation were downloaded from the TBIBank website.

• The CLAN Frequencies routine (MacWhinney, 2000) was used to generate la ist of all words and their frequency of mention.

• Dependent measures:

f**irst person singular** pronouns (e.g., “I”, “I’ve”,“me”, “myself”),

f**irst person plural** pronouns (e.g., “we”, “we’ve”, “our”),

second person pronouns (e.g., “you”, ”your”, “you’re”).

• Raw word counts were converted to percentages of total words.

• First person plural forms were rare and will not be discussed.

RESULTS

- Pronoun use corroborates and extends Coelho et al. findings that extra work was required when the examiner interacted with persons with TBI: the examiner made greater use of second person pronouns, "you" and related forms.
- Figure 1A shows that examiner used more “you” forms when interacting with participants with TBI. The interaction was reliable.
- Figure 1B shows that participants with TBI, in turn, used “I” forms more often than participants without TBI. The interaction was reliable.
- A strong Pearson's r between the examiner’s use of “you” and participants’ use of “I” reflects reciprocity in the conversations, r = .55.
- Controlling for the reciprocity between examiner and participants’ use of pronouns, multiple regression showed participants' use of "I" was independently linked to younger age, lower education, and gender (women), as well as to having sustained a TBI.

Figure 1A. Speaker: Examiner. Error bars: +/- 1 SEM.

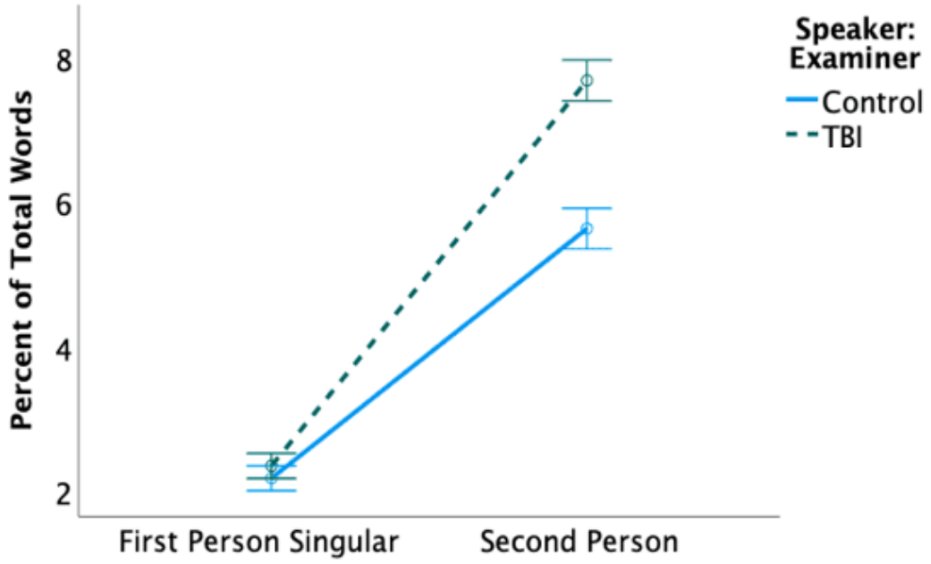
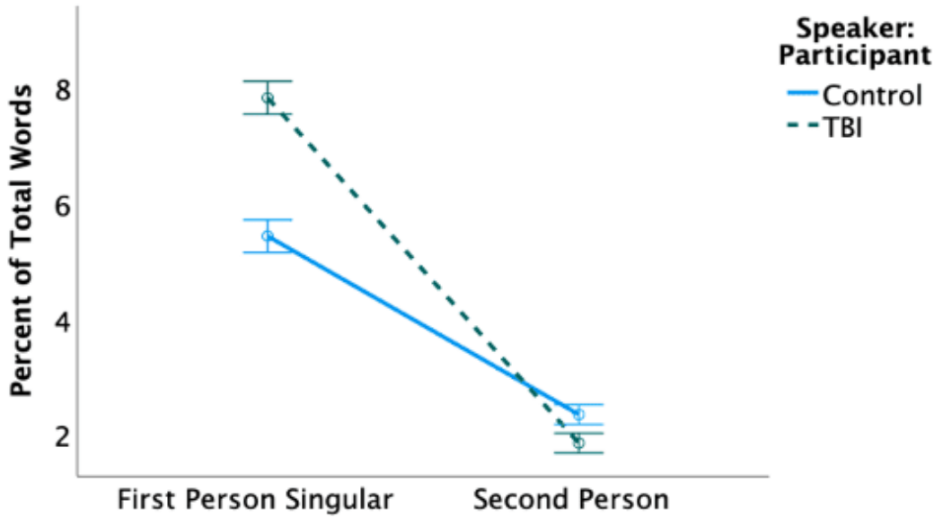


Figure 1B. Speaker: Examiner. Error bars: +/- 1 SEM.



Participant's use of 1st person singular forms

Predictor variable	Beta	t(90)	Sig.	Bivariate r value
Examiner's use of 2nd person	+.269	3.01	.003	.55*
Gender	-.24	-3.22	.002	-.13
Edu	-.24	2.84	.006	-.41*
Age	-.17	2.20	.031	-.37*
Group `	-.37	4.47	<.001	-.53*

$R^2 = .53$, $F(5, 90) = 20.48$, $p < .001$
*p<.05 two-tailed, df = 94 for bivariate r values

DISCUSSION AND CONCLUSIONS

- Pronoun use reflects several social and cognitive aspects of how people interact (Pennebaker, 2013).
- Pronoun use characterizes the unusual discourse style associated with TBI.
- The imbalance between the use of "you" and "I" provides a potential target for cognitive-linguistic remediation. Training speakers with TBI to ask "you" questions may not by itself make a conversation unremarkable; however, posing direct questions is a specific skill that can be practiced.
- Asking more such questions will help to direct a speaker with pragmatic challenges to shift attention from the self and towards a conversational partner.
- Changes in pronoun use can be measured reliably and accompanied by other assessments of discourse skill.
- Future work is needed to test the generalization of these patterns to conversations with untrained partners.

REFERENCES

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AUTHOR INFORMATION & DISCLOSURES

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Hiram Brownell received his Ph.D. in psychology in 1978 from the Johns Hopkins University. Brownell is currently a professor in the Department of Psychology and Neuroscience at Boston College. In the past he has had affiliations with the University of Southern California, Boston University School of Medicine (Department of Neurology, Aphasia Research Center), Brandeis University, and the Boston Veterans Administration Medical Center. His research centers on effects of right hemisphere injury and traumatic brain injury.

Financial Disclosure(s): No, I do not have financial relationships relevant to the content of the session.
Nonfinancial Disclosure(s): No, I do not have nonfinancial relationships relevant to the content of the session.

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Kristine Lundgren, Sc.D., CCC-SLP is Professor and Department Chair in CSD at the University of North Carolina Greensboro. She received her B.A. from the University of Connecticut, her M.S. and Sc.D. from Boston University, and completed an NIH Postdoctoral Fellowship in Aphasiology at the Harold Goodglass Aphasia Research Center. Dr. Lundgren's current research projects include the exploration of disorders in figurative language and Theory of Mind following RHD or TBI and intimate partner violence-related TBI.

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NARRATION

Hello, my name is Hiram Brownell. I am a professor of psychology and neuroscience at Boston College. My colleague and co author is Kristine Lungren who is a professor and department chair at the University of North Carolina, Greensboro. We will be exploring the effects of traumatic brain injury on dyadic conversations.

Traumatic brain injury can lead to altered functioning and communication that, in turn, limits successful reintegration into work and social environments. Conversational discourse calls on a range of component skills, from basic linguistic processing to more complex skills such as attention, executive functioning, and theory of mind. Because of this, performance in conversation can be impaired following traumatic brain injury. In this study, we explore a technique for examining one specific feature of what two people bring to a conversation. More specifically, we look at how pronoun use can characterize aspects of the exchange between two individuals. Text analysis has generated large body of work in different domains of language, language acquisition and social cognition. Pennebaker and colleagues, for example, have documented how counting the relative frequency of specific categories of words can provide insight into a variety of psychological constructs such as social power and depression. Some studies have even used pronouns. In particular, our analysis, among them, focused on a restricted set of personal pronouns used in conversation.

Our choice was inspired by studies by Carl Coelho and his colleagues who provided the foundation for our work in two crucial ways. First, Coelho at all posted their raw data to the TBI bank website. Also, those conversations and the transcripts were formatted using CLAN software. A second major contribution by Coelho et al. was that these authors provided a very careful linguistic analysis comparing the conversations of persons with TBI to conversations of persons without TBI. Their analysis provided guidance for our particular choice of pronouns to focus on, and also the Coelho et al. results provided important validation for our own conclusions and interpretations for our study. Thus, we explore a straightforward technique for examining one aspect of conversation. We explore how pronoun use characterizes the interdependent performance of two individuals engaged in conversation.

I'll now say a little bit about the methodology. I'll start with a description of the participants. As I alluded to, there was one speech language pathologist, a 42 year old male, who had conversations with both people with TBI and with neurotypical people with no history of TBI. There were a total of 48 people with TBI and a total of 48 without TBI who provided usable transcripts for analysis.

We downloaded these transcripts from the TBI bank website and then analyzed them using the CLAN software. Specifically, we used the frequencies routine within the CLAN package to produce word counts for personal pronouns of three different types. One was first person singular pronouns, including words such as I, me, myself, my, and mine. The second category consisted of first person plural pronouns such as we and our. The third and final category consisted of second person pronouns such as you and your, yourself, etcetera. We obtained counts for each one of these categories and turned them into percentages using the total number of words each participant produced. First person plural forms, such as we, were relatively rare, especially for persons with TBI. For that reason, we will not discuss them in this study. Overall, then, we obtained frequencies of first person singular and second person pronouns produced by both the speech language pathologist, whom we refer to as the examiner, and a participant. Again, the participant was someone who had a history of TBI or someone who had no history of TBI.

Now for some results, our statistical analysis focused on two dependent measures. The percentage of first person singular pronouns and the percentage of second person pronouns. Overall, our results corroborate and extend the findings from Coelho et al. Figure 1A shows that the examiner rarely used first person forms such as I, and, importantly, used second person forms, such as you, much more often when interacting with participants with TBI than with participants without TBI. In Figure 1B, you see that the participants with TBI, in turn, used first person singular forms, such as I, much more often than did participants without TBI. Neither of the two groups of participants used second person forms, such as you very often. The interactions in both Figure 1A and in Figure 1B were statistically reliable.

Together, these patterns show that the examiner more often uses second person forms, such as you, when interacting with a person with TBI, which suggests that the examiner was using more directed questioning to elicit responses and to maintain the flow of conversation.

We carried out additional analyses to confirm and also look beyond this reciprocity between the examiner and the participant. Now,overall, there was a strong correlation between the examiner's use of second person forms and the participant's use first person singular forms. That correlation was 0.55. Going beyond that correlation, we used multiple regression to look for other effects over and above the reciprocity. That is, we looked to see whether there is more going on than simply responding to the examiner's use of you. Controlling for that reciprocity, we found other independent effects. People with TBI use more first person singular forms independent of what the examiner is doing. Similarly, participants with less education, who are women, and who are younger, also use more first person forms. These last findings showing extra use of first person forms, such as I, help describe a conversational style associated with traumatic brain injury and possibly with other participant characteristics as well.

All told, our results suggest that the analysis of pronouns may provide an efficient way to characterize the extra effort required by someone speaking with a person with traumatic brain injury. This interpretation confirms the analysis of Coelho and colleagues. Indeed, the examiner worked harder to maintain conversations with individuals with TBI. There's good evidence to suggest that the examiner's use of second person pronoun forms, often in the context of questions posed to maintain the conversation, is linked to participants' use of first person singular forms.

The greatest challenge associated with our results is tied to the generality. Future work will need to explore what elements of a discourse context matter most. For example, people with TBI and their conversational partners may have more difficulty when the goals of an exchange and the expectations for the participants are not explicitly defined beforehand. The interaction goals thus must be established during the conversation.

In summary, pronoun tabulation characterizes the unusual discourse styles often seen with traumatic brain injury, despite the uncertainties about some of the underlying causes. In addition, the relative imbalance between the use of you and I in dyadic conversation provides a potential target for cognitive linguistic remediation. For example, people can practice asking questions whenever there's a pause in conversation: If you're unsure what to say next, ask a question about the person you're talking to. Or the person with TBI may be instructed to ask something about the other person after every time they say something about themselves. Our results suggest that training speakers with TBI to ask questions using forms such as you may not by itself make a conversation unremarkable. However, posing direct questions is a specific skill that can be practiced. These improvements may assist individuals with TBI to reintegrate into work or social environments and may assist in improving their social communication.