



# Have you seen this? The impact of concussion and memory on narrative retells of a silent animated video

Lauren Harrington

Department of Communication Sciences and Disorders, University of New Hampshire

Master's Thesis Advisor: Kathryn J. Greenslade



## Introduction

- Concussions are mild traumatic brain injuries experienced by ~30% of adults, which result in cognitive deficits for  $\geq 1-2$  weeks.<sup>1</sup>
- Prior studies reveal mixed results in narrative retell length following concussion.<sup>2,3</sup>
- New narrative retell tasks are needed to address ecological validity<sup>4</sup> & sensitivity to subtle deficits post-concussion.<sup>3</sup>
- Concussions can impact working memory<sup>5</sup>, or the ability to retain & manipulate newly presented information.<sup>6</sup>
- Working memory deficits can negatively impact production of unfamiliar narratives (i.e. retelling a movie you just watched).

## Aims

1. Compare total utterances & mean length of utterance in words (MLUw) of video retells in speakers with concussion & no brain injury (NBI)
2. Determine if there is a relationship between performance in working memory tasks & video retell length in speakers with concussion

## Methods

Demographic	NBI (n=21)	Concussion (n=20)
Sex (M:F:O)	2:18:1	7:13:0
Mean age in years (SD)	19.32 (1.57)	19 (1.26)
Race	White: 18 Asian: 2 Mixed Race: 1	White: 18 Asian: 1 Mixed Race: 1
Monolingual	15	18
Education level	High school/GED: 19 4-year college degree: 2	High school/GED: 19 4-year college degree: 1

NBI= No brain injury; M:F:O= male:female:other; (SD)= standard deviation

## NIH ToolBox – Cognitive Battery<sup>7</sup>

- Picture Sequence Memory Test (PSMT)
- List Sort Working Memory Test (LSWMT)

## Presto<sup>8</sup> video retell task<sup>9</sup>

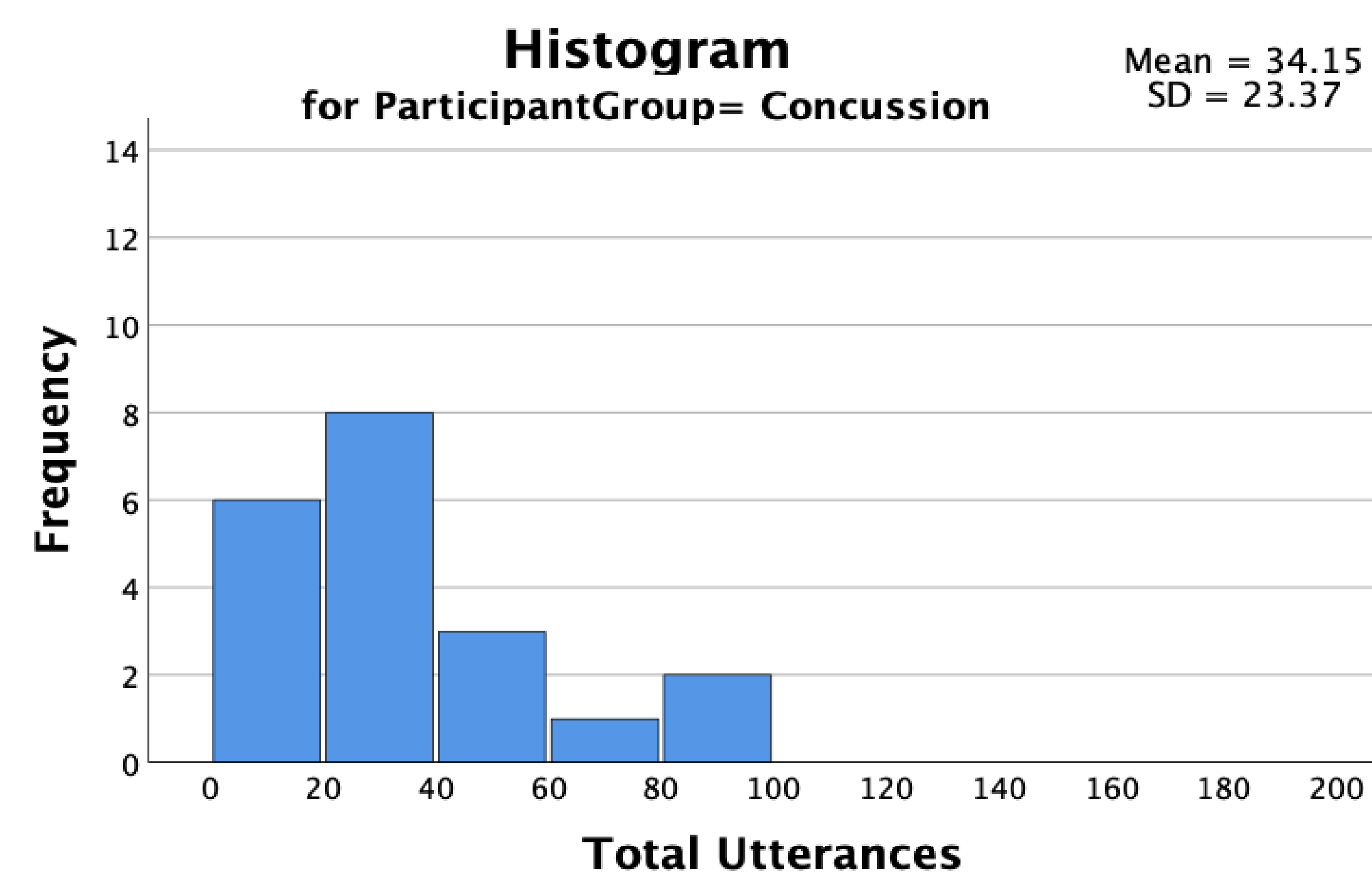
- Each watched the video & retold the story in as much detail as they remembered.
- 41 samples transcribed, 9 with interrater reliability ( $> .80$ )

## Static vs Dynamic Stimuli for Narrative Retell Tasks

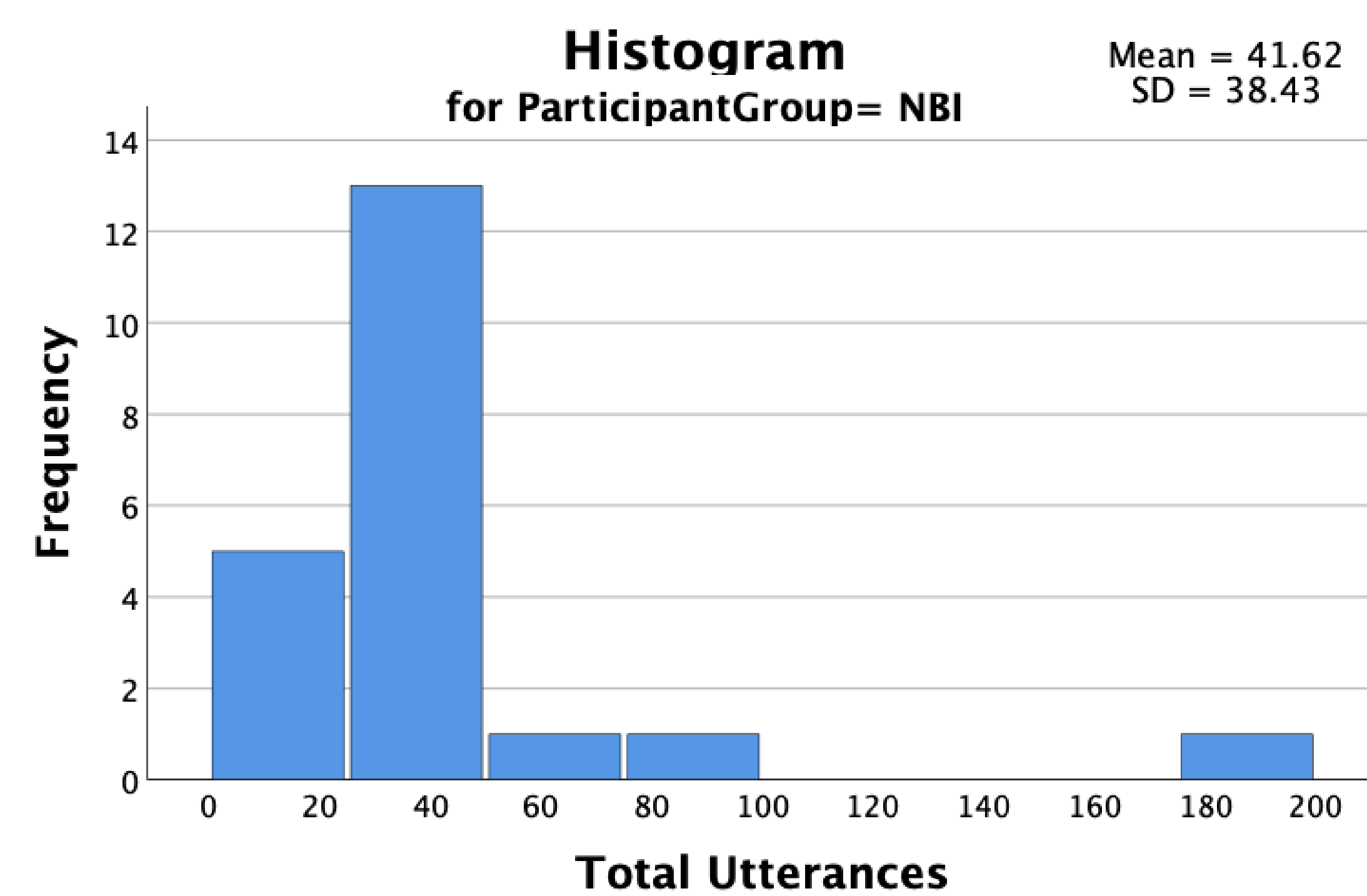


## Results

### Aim 1. Distributions of Total Utterances



NBI= No brain injury; SD= standard deviation

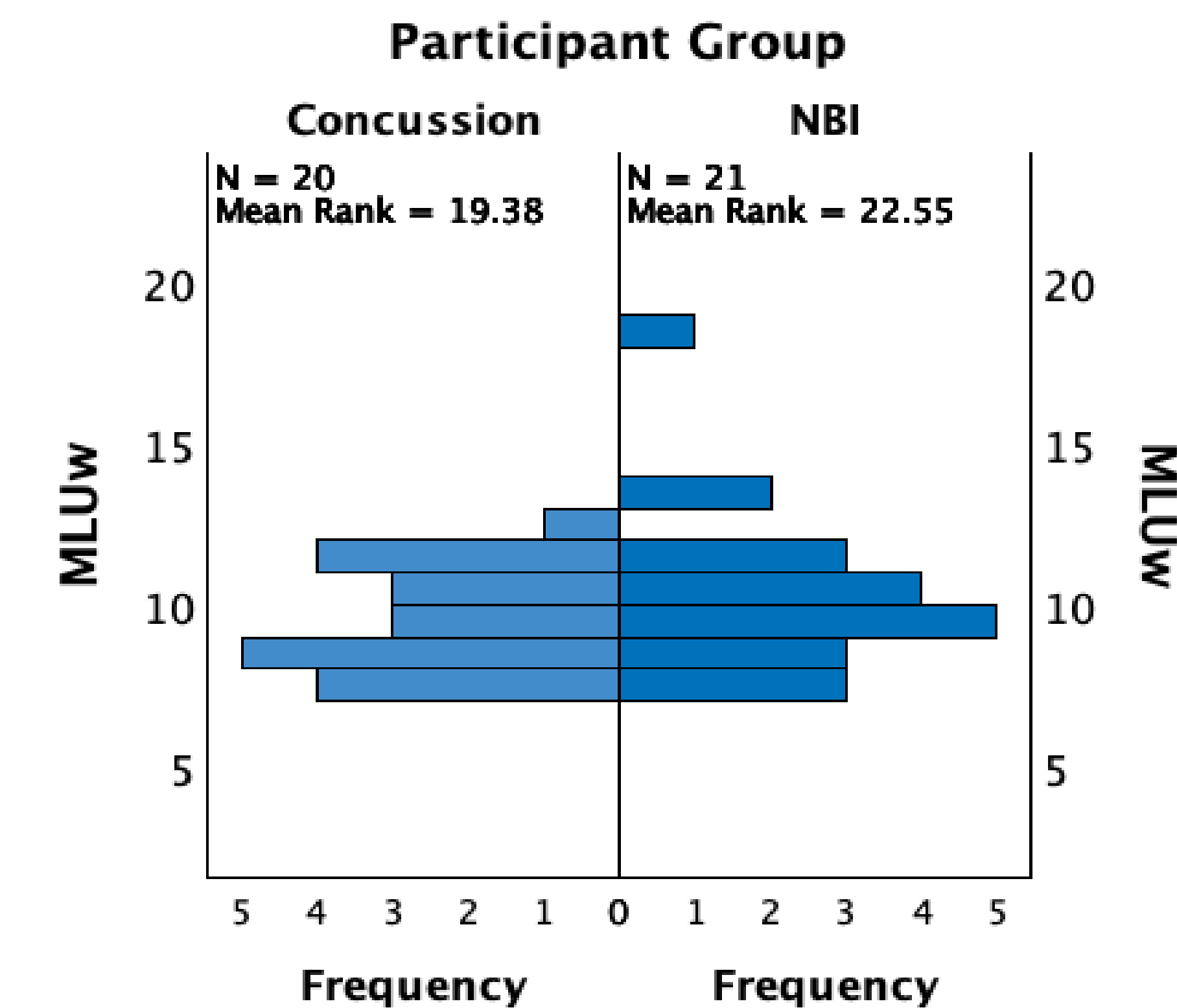


NBI= No brain injury; SD= standard deviation

RQ1: No significant difference in total utterances or MLUw in speakers with and without concussion.

### Aim 1. Mean Ranks of MLUw

#### Independent-Samples Mann-Whitney U Test



NBI= No brain injury; MLUw= mean length of utterance in words

### Aim 2. Correlations Between Memory Performance and Narrative Length

Variables	NIH Toolbox: List Sort Working Memory Test		NIH Toolbox: Picture Sequencing Memory Test	
	$r_s$	$p$	$r_s$	$p$
Total utterances	-.426	.078	-.072	.777
MLUw	.145	.565	.130	.607

NIH = National Institutes of Health; MLUw = mean length of utterance in words

RQ2: No significant correlation between total utterances or MLUw with performance on PSMT or LSWMT.

## Conclusion

- Between-group similarity in video retell length speaks to the subtlety of concussion symptoms & brief recovery period.
- Other between-group differences could exist.
- Performance on working memory tasks was not related to video retell length in speakers with concussion.

## Future Directions

- Explore macrostructural performance on narrative retells to determine presence of differences at this level.
- Compare video retell length in the present task and retells with different conditions.
- For example: Compare to video retell task where visual support is provided during narration

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