EasyChair Preprint

№ 3825

Exploring the Differences between College Students' Think-Aloud Responses for Narrative and Expository Texts

Heather Ness-Maddox, Amanda Dahl, Erin Reynolds,
Sarah E. Carlson, Ben Seipel, Virginia Clinton and Mark Davison

July 12, 2020

Exploring the Differences between College Students' Think-Aloud Responses for Narrative and Expository Texts

Heather Ness-Maddox[1], Amanda Dahl[1], Erin Reynolds[1], Sarah E. Carlson[1], Ben Seipel[2], Virginia Clinton,[3] & Mark Davison[4]

[1]Georgia State University

[2]California State University - Chico

[3]University of North Dakota

[4]University of Minnesota

Author Note

This project is funded by the Institute of Education Sciences, U.S. Department of Education, Grant No. R305A180417, awarded to Drs. Ben Seipel, Sarah E. Carlson, Mark Davison, and Virginia Clinton. For further information about our research, please contact Sarah E. Carlson (scarlson@gsu.edu). Correspondence concerning this preprint should be addressed to Heather Ness-Maddox. Email: hness1@student.gsu.edu

Abstract

Previous think-aloud research with children found differences in online processing between expository and narrative texts (e.g., Karlson et al., 2018). We sought to extend these findings to adult readers. We compared responses generated by college students during think-aloud tasks. Our adult readers showed similar differences between text genre as found by previous studies with children. With expository texts, readers produced more associations, metacognitions, and text connections. With narratives, readers produced more valid elaborations and predictions.

Keywords: reading comprehension processes, narrative text comprehension, expository text comprehension, think-aloud

Exploring the Differences between College Students' Think-Aloud Responses for Narrative and Expository Texts

To comprehend text, readers must construct a situation model or mental representation of the text (Zwaan, 2015). Ideally, readers construct this model by extracting information from the text and building connections between pieces of information through inference generation, aided by relevant background knowledge (Zwaan & Radvansky, 1998). Comprehension researchers differentiate between offline comprehension products (outcomes) after reading versus online comprehension processes (thoughts) during reading (Kraal et al., 2018). Through think-aloud studies, researchers can observe how readers construct mental models of the text (e.g., Carlson et al., 2014). Researchers have identified think-aloud differences in children's online processes used while reading expository and narrative texts (Karlson et al., 2018; Kraal et al., 2018).

Expository and Narrative Text Comprehension

College students are tasked with reading multiple types of text for academic success, generally categorized as narrative and expository. Expository texts are posited to be more difficult than narrative texts for many reasons, including less-familiar words and concepts, more complex sentences, and diverse structures (Karlsson et al., 2018), as well as the absence of a main character and causal coherence (Kraal et al., 2018). Previous findings have shown with narrative texts, children generated more valid elaborations, while with expository texts, they generated more unrelated associations, invalid elaborate inferences, paraphrases (Kraal et al., 2018; Karlsson et al., 2018; Botas, 2017), and metacognitive strategies (Botas, 2017).

Researchers also have conducted think-aloud tasks with adult readers reading both expository and narrative texts (Goldman et al., 2012); however, limited studies have compared processing differences between the text genres. Specifically, researchers have not yet conducted think-aloud studies to explore adult processing differences between expository and narrative texts.

The Current Study

In the current study, we hope to extend the literature on online processing for expository and narrative from children to adult readers to see if adults process different text genres similarly to how children do. Our research question is, to what extent do expository texts elicit different types of online reading comprehension processes than narrative texts for adult readers during a think-aloud task? To answer this question, we recruited college students to participate in think-aloud tasks with both expository and narrative texts and compared the processes generated between text genre.

Methods

Participants

We randomly selected 84 undergraduate students from two higher education institutions in the West (N = 28) and Midwest (N = 56) of the United States who participated in a larger assessment validation study. Participating students received an Amazon gift card.

As identified from a demographic survey, participant ages ranged from 18 to 45 years (M = 21.16, SD = 4.69. Most of the participants identified as women (N = 51), the next largest group identifying as men (N = 25), and 1 participant identified as genderfluid/non-binary. Most participants identified as cisgender (N = 75) and 1 person

identifying as transgender. The majority of participants indicated they were full-time students (*N* = 73). Most participants responded as freshmen (*N* = 25), then sophomore (*N* = 16), junior (*N* = 14), senior (*N* = 13), post-baccalaureate (*N* = 3), and graduate (*N* = 6). The majority of participants identified as White (N = 63), then Black/African American (*N* = 3) and Asian (*N* = 3), American Indian/Alaska Native (*N* = 1). Of our participants, 13 identified as Hispanic. The majority indicated that English was their primary language (*N* = 71), with Spanish (*N* = 2), Chinese (e.g. Mandarin, Yueh, etc.) (*N* = 1), Korean (*N* = 1), and Urdu (*N* = 1) also indicated.

Materials

There were four texts from previous think-aloud studies (van den Broek et al., 2006) used during the think-aloud task: 2 expository and 2 narrative texts. *Expository text 1* had a Flesch-Kincaid (FK; Kincaid et al., 1975) of 8.5, and included 14 lines, including the title. *Expository text 2* had an FK of 8.5 and contained 18 lines. *Narrative text 1* had an FK of 7.5 and included 13 lines. *Narrative text 2* had an FK of 8.5, and included 14 lines.

Procedures

Think-Aloud Task

Two primary researchers and two graduate students conducted the think-aloud tasks. Participants were presented each text one sentence at a time (the title as the first line of text) and were prompted to read each sentence aloud and respond with whatever thoughts came to mind during reading. The order of texts was counterbalanced. Participants' verbal responses were recorded for transcription and coding.

Coding

Three graduate students and one primary researcher coded the transcribed responses based on previous research (e.g., van den Broek et al., 2001). Responses were parsed into separate idea units (i.e. phrases) and coded as *Associations, Evaluative* comments, *Invalid*/*Valid Elaborations*, *Invalid*/*Valid Predictions, Metacognitive* comments, *Text Connections,* and *Paraphrases* (see Table 1 for definitions). Researchers coded 20% of participant responses in common, with at least two researchers coding those participants. Cohen's *kappa* of interrater reliability was .85.

Table 1

Processing Responses and Definitions

Processing Response	Definition
Associations	Comments about personal experiences
Evaluations	Comments about the function or content of the text or readers' affective response about the text
Invalid Elaborations	Invalid explanation about content, causal relationships, text structure, or emotions
Valid Elaborations	Valid explanation about content, causal relationships, text structure, or emotions
Invalid Predictions	Invalid prediction about future text content
Valid Predictions	Valid prediction about future text content
Metacognitive comments	Agreement/disagreement, amount of understanding, lack of background knowledge, questions about the text
Text Connections	Connections to text immediately preceding (local) or previously read (global)
Paraphrases	Rewording or exact repetition of the text

Data Analysis

All codes were tallied for each participant. Some participants generated more idea

units than others, and the texts were of varying length. In order to make the total idea units comparable across participants and texts, we divided the total of each coded variable by the total number of idea units the participants generated across the four texts. This transformation provided percentages of each code the participants engaged in. Only participants with responses to at least one narrative and one expository text were analyzed. One participant only responded to expository texts and was not included in the analyses. Thus, $N = 83$ participants were included in the final analyses.

Because subjects completed think-aloud tasks for both text-type conditions and were coded for multiple types of processes, we conducted a one-way repeated measure multivariate analysis of variance (MANOVA). We compared participants rate of responses on the 9 types of cognitive processing responses (see Table 1) between the two text genres: expository and narrative.

Results

To confirm lack of multicollinearity, we correlated the variables by text genre. None of the variables in either condition correlated higher than .65, so the assumption of lack of multicollinearity was met.

All variables, except valid elaborations and text connections, were highly skewed (absolute value of skewness greater than 1) and violated the assumption of normality. In both expository and narrative conditions, 83 participants did not generate any invalid predictions, and this variable was removed from analysis. Because of the lack of normality among variables, we referred to Pillai's trace statistic for outcome of the MANOVA. The overall MANOVA showed significant differences in processing responses between text genre (Pillai's trace $= .669$, $F(9, 74) = 16.65$, $p < .001$, $\eta^2 = .67$).

To determine which processes differed between text genre, we conducted follow-up univariate ANOVA analyses.

We referred to the Greenhouse-Geisser statistic for the ANOVA analyses (see Table 2). The ANOVA results showed participants produced more associations ($F(1, 82) = 7.24$, $p < .01$, $\eta^2 = .08$), metacognitive comments ($F(1, 82) = 9.85$, $p < .01$, $\eta^2 = .11$), and text connections ($F(1, 82) = 48.29$, $p < .001$, $\eta^2 = .37$) for expository than narrative texts. In addition, participants produced more valid elaborations ($F(1, 82) = 17.13$, $p < .001$, $\eta^2 = .17$) and valid predictions ($F(1, 82) = 18.53$, $p < .001$, $\eta^2 = .18$) for narrative than expository texts. No significant differences emerged for evaluations or paraphrases.

Table 2

Univariate ANOVA Tests of Process Differences between Text Type

Process	Sum of Squares	*DF*	*F*	η^2	Expository		Narrative	
					M	*SD*	*M*	*SD*
Associations	.04	1	7.24*	.08	.06	.07	.03	.48
Evaluations	.02	1	3.21	.04	.04	.06	.06	.08
Invalid Elaborations	.01	1	1.75	.02	.07	.08	.06	.06
Valid Elaborations	.42	1	17.13**	.17	.38	.15	.47	.16
Valid Predictions	.07	1	18.53**	.18	.05	.04	.08	.07
Metacognition	.14	1	9.85**	.18	.14	.13	.08	.09
Text Connections	.25	1	48.29**	.37	.15	.09	.07	.05
Paraphrases	.00	1	.02	.00	.10	.19	.11	.12

*p<.01 **p<.001. Note: Means and standard errors are based on the ratio of process to total responses for a participant. In the expository condition, $N = 84$, and $N = 83$ for the narrative condition.

Discussion

In this study we explored how adult readers processed narrative and expository texts during think-aloud tasks. We found our adult readers engaged in different types of processes while reading expository versus narrative texts. Specifically, while reading expository texts, readers produced more associations, metacognitive comments, and connections to previous text information, just like young readers (Kraal et al., Karlson et al., 2018; Botas, 2017). Specifically, readers made statements about whether or not they agreed with the texts or whether they understood the texts. They commented if the text brought up information they did not previously know. They asked questions. With associations, readers related the text to their personal experiences. Readers also made more text connections back to previous lines of text for expository than narrative. These findings suggest readers attempted to connect ideas throughout expository texts. Overall, readers engaged in a conversation with expository texts in a way they did not with the narrative texts.

When reading narrative texts, our readers produced more valid elaborations and predictions about the text. These results as well support previous studies conducted with children (Kraal et al., 2018; Karlsson et al., 2018; Botas, 2017). One possible explanation for this processing difference between narrative and expository texts is that, unlike expository texts, narratives have a reliable story structure familiar to advanced readers (Botas, 2017), allowing readers to apply appropriate background knowledge to interpret an unfamiliar story and make accurate predictions. Even though our readers engaged in more valid elaborations for narrative texts than expository, these findings do not imply our readers necessarily did not comprehend the expository texts as well as the narrative

texts. Rather, without considering how well the readers understood the content of each text, we can conclude they engaged with the texts differently depending on genre.

Limitations, Future Directions, and Conclusions

Previous studies with children found young readers made more invalid elaborations and paraphrases for expository than narrative texts (Kraal et al., 2018; Karlsson et al., 2018); however, we did not replicate this difference. Possibly our adult readers, being more educated and more experienced than younger readers, have more background knowledge which helps them refrain from making inaccurate elaborations. However, before making this conclusion, we would need to include both young and adult readers in our study and compare their responses.

Previous studies with children not only compared processing strategies during reading for expository and narrative text, but researchers also divided young readers into good and poor comprehenders (Seipel et al., 2017). Comprehension skill has an effect on how young readers process text (Seipel et al., 2017; Carlson et al., 2014). In the current study, we did not include comprehension level as a possible effect on processing responses. In our future research, we can further test processing differences between text genre by categorizing our readers as good or poor comprehenders and testing an interaction between comprehension level and text genre on processing responses.

Other studies have also performed latent profile analysis (LPA) on think-aloud data with children (Karlson et al., 2018). These studies have not yet been replicated with adult readers. This type of exploratory analysis would group our readers by processing patterns. While we found significant differences in processing responses by text genre, we cannot conclude the same participants who generate metacognitive comments while

reading expository texts are also generating associations and text connections. Conducting an LPA would inform what kind of processing patterns our adult readers use for each text genre.

Overall, our findings suggest adult readers do engage in different types of processing depending on whether they are reading expository or narrative texts. Our adult readers processed texts similarly to how children have in previous studies. Therefore, our findings suggest overall processing differences between text genres persist across age groups. However, future research is needed to test text processing differences between groups of younger and adult readers.

References

Botas, G. (2017). Differences in strategy use in the reading comprehension of narrative and science texts among students with and without learning disabilities. *Learning Disabilities: A Contemporary Journal, 15*(1), 139-162.

Carlson, S., Seipel, B., & McMaster, K. (2014). Development of a new reading comprehension assessment: Identifying comprehension differences among readers. *Learning And Individual Differences, 32*, 40-53. doi: 10.1016/j.lindif.2014.03.003

Goldman, S.R., Braasch, J.L.G., Wiley, J., Graesser, A.C., & Brodowinska, K. (2012). Comprehending and learning from internet sources: Processing patterns of better and poorer learners. *Reading Research Quarterly, 47*(4), 356-381.

Karlsson, J., van den Broek, P., Helder, A., Hickendorff, M., Koornneef, A., & van Leijenhorst, L. (2018). Profiles of young readers: Evidence from thinking aloud while reading narrative and expository texts. *Learning And Individual Differences, 67*, 105-116. doi: 10.1016/j.lindif.2018.08.001

Kincaid, J.P., Fishburne, R.P., Rogers R.L., Chissom B.S. (1975). Derivation of New Readability Formulas (Automated Readability Index, Fog Count and Flesch Reading Ease Formula) for Navy Enlisted Personnel. Naval Technical Training Command Millington TN Research Branch. RBR-8-75

Kraal, A., Koornneef, A., Saab, N., & van den Broek, P. (2018). Processing of expository and narrative texts by low- and high-comprehending children. *Reading And Writing, 31*(9), 2017-2040. doi: 10.1007/s11145-017-9789-2

Seipel, B., Carlson, S., & Clinton, V. (2017). When do comprehender groups differ? A

moment-by-moment analysis of think-Aloud protocols of good and poor comprehenders. *Reading Psychology*, *38*(1), 39-70. doi: 10.1080/02702711.2016.1216489

van den Broek, P., Lorch, R., Linderholm, T., & Gustafson, M. (2001). The effects of readers' goals on inference generation and memory for texts. *Memory & Cognition, 29,* 1081–1087. doi: 10.3758/bf03206376

van den Broek, P., McMaster, K. L., Rapp, D. N., Kendeou, P., Espin, C. A., & Deno, S. L. (2006, June). *Connecting cognitive science and educational practice to improve reading comprehension*. Paper presented at the Institute of Education Sciences Research Conference, Washington, DC.

Zwaan, R. (2015). Situation models, mental simulations, and abstract concepts in discourse comprehension. *Psychonomic Bulletin & Review*, *23*(4), 1028-1034. doi: 10.3758/s13423-015-0864-x

Zwaan, R. A., & Radvansky, G. A. (1998). Situation models in language comprehension and memory. *Psychological Bulletin, 123*(2), 162–185. https://doi.org/10.1037/0033-2909.123.2.162