The Effects of Podcast Sound Bites on Information Retention: An Experimental Analysis

Emily A. Dolan, Slippery Rock University, United States
Brittany L. Fleming, Slippery Rock University, United States

Abstract

Podcasts are an increasingly popular tool for teaching and learning in higher education (e.g., Newman et al., 2021). These audio recordings often couple narration with sound bites, or excerpts from interviews. To date, little-to-no research has been conducted on the cognitive effects of educational podcasts. This lack of research, in combination with the structure of podcasts, begs the question: *Does the use of sound bites in podcasts affect information retention?* The current study uses the limited capacity model of mediated message processing (Lang, 2006) to explore this question. We use a between-groups experimental design to investigate if the use of sound bites affects retention of information. Participants were randomly assigned to one of three podcast groups: (1) Long sound bites, (2) Short soundbites, and (3) No sound bites. A post-test about the podcast content was administered directly after exposure to the podcast, and each participant received a score out of 10 representing the total number of correct answers. Results revealed no difference in information retention between groups. These results are discussed in light of their implications for research and application in educational contexts.

Keywords: Podcasts, Sound Bites, Message Processing

iafor

The International Academic Forum
www.iafor.org

Introduction

Podcasts are a major source of news and information for young adults (Bratcher, 2022). Podcasts are centered around many different themes, including, but not limited to, social belonging and companionship (Rime, Pike, & Collins, 2022). Of interest to the current study is the central theme of education; podcasts are often used as means to learn about news and information (Rime et. al., 2022). Unsurprisingly, then, podcasts have become an increasingly popular tool for teaching and learning in higher education (e.g., Newman et al., 2021).

A podcast is a piece of media that is available in digital format in online environments (e.g., Apple Music, Spotify, various applications). Often, podcasts are in serial format, are program-driven, and span a wide array of content areas (e.g., health and wellness, politics, sports, video games; Berry, 2006; Berry 2015). Regardless of content area, however, podcasts frequently couple narration with sound bites, or excerpts, from interviews. This is particularly true for news-based podcasts.

Given their popularity in educational contexts (Newman et al., 2021), it becomes important to examine how podcasts may impact educational outcomes. In the current study, we examine how one particular element of podcasts, the use of soundbites, impacts a major desirable educational outcome: Information retention.

To date, little-to-no research has been conducted on the cognitive effects of educational podcasts. This lack of research, in combination with the structure of podcasts, begs the question: *Does the use of sound bites in podcasts affect information retention?* Using the limited capacity model of mediated message processing (Lang, 2006), this study uses a between-groups experimental design to investigate if the use of sound bites affects retention of information in news-based podcasts.

Information Processing: The Limited Capacity Model for Motivated Mediated Message Processing (LC4MP)

Of central interest to the current study is how the use of sound bites in podcasts impacts the retention of information contained within the podcast. To understand this question, we turn our attention to an overview of short-and long-term memory processing using the limited capacity model for motivated mediated message processing (LC4MP) as a guiding theoretical framework.

Humans are cognitive misers. In large part, this is due to our limited information processing capabilities (Lang, 2017). As such, the retrieval, storage, and encoding of information is largely an automatic process (Lang, 2017; Rumelhart, Lindsay & Norman, 1972). This idea is most certainly true in new media landscapes, where individuals are inundated with information at a rapid pace.

For years, short and long-term information processing has been examined by researchers across disciplines. Rumelhart, Lindsay, and Norman (1972) see information processing as a three-step process that starts with exposure to a message. Next, according to the trip, comes the attention phase: A person chooses to ignore the information, which in turn causes the information to deteriorate in memory (i.e., attention diversion), or they choose to pay attention to this information. From there, the information is then encoded into their short-term, working memory (Ruiji, 2012). Once this step is complete, this information may be

integrated into long-term memory, and is stored with other accumulated knowledge (Fleming, 2006).

But what information gets encoded into memory and what information does not? Cognitive load theory (Schweppe & Rummer, 2014; Sweller et al., 1998; Chandler & Sweller, 1991) suggests that working memory has a limited capacity which can be easily exceeded in a variety of ways, such as receiving information that is redundant. Academic research by Sweller and Chandler (1994) provide evidence of this phenomenon in an educational context. They found that students perform better when redundant information is removed from a lesson, compared to students who are exposed to redundant information.

Long-term memory does not appear to have similar capacity limitations. Focusing primarily on long-term retention, the Limited Capacity Model for Motivated Mediated Message Processing (LC4MP; Lang, 2006) sees three steps in cognitive processing, which include encoding, storage, and retrieval. These steps are viewed as constant, continuous, and simultaneous.

Of the components of LC4MP, three are most relevant to this study: people have limited processing capacity; people process information in order to survive and thrive in an uncertain world; and mediated and non-mediated communication is processed in a similar fashion (Fisher & Weber, 2020; Pavolik, 2015; Fulton, 2014). While the limitations of working memory can limit what is successfully processed into long-term memory, the capacity of long-term memory is notably greater than working memory. (Schweppe & Rummer, 2014).

One potential way that information may be stored in memory is through attentional processes. If an individual pays attention to information, it becomes more likely that they will encode it into their short-term memory. From this, the question arises for educators: How might a message be more likely to gain attention? In the current study, we look at specifically at podcasts and propose that one way to influence attentional processes, and therefore information retention and memory, is through the use of sound bites. We now turn our attention to a discussion on sound bites in media and podcasts.

The Use of Sound Bites in News Media

Research regarding the use of sound bites in podcasts is relatively non-existent. To better understand how the use of sound bites in podcasts may impact information retention, we focus on other types of media, specifically television.

One of the key assumptions of American culture is that news programming creates a better-informed society. Partly as a result of this perspective, as well as the competition for ratings, the news industry attempts to feed as much information as possible to the viewers, in the quickest manner possible. One technique for incorporating additional media into a story is the added production element of soundbites. Studies show that sound bites in journalism have decreased from 43 seconds in 1968 to about 9 seconds in 1992 and has stabilized since (Hallin, 1992; Farnsworth & Lichter, 2011).

When it comes to television sound bites, critics argue that sound bites provide insufficient time for politicians to articulate their positions on issues, which ultimately results in fragmented, journalist-centered public discourse (Rinke, 2016; Bennett, 2009; Lichter, 2001).

One purpose of the soundbite is to deliver information to the audience directly from the source. If news consumers are expected to make informed opinions and decisions based on news stories that include sound bites, how can they successfully do so? The current student will explore this question and explain how this idea translates to news podcasts. We specifically focus on the following question:

RQ1: Does the inclusion of sound bites in news programming lead to increased information retention?

Methodology

A total of 132 undergraduate students were recruited from a mid-size public university in the northeast. Participants averaged an age if 19.86 years ($SD = 1.30$), were mostly female ($N = 84$), and White ($N = 117$).

This study utilized a between-group experimental design. Upon recruitment, participants were instructed to bring their headphones and listening device (e.g., laptop, tablet) to the classroom. Next, they clicked a link to a survey and then were randomly assigned to sound bite condition: (1) No soundbites, (2) Short soundbites (i.e., 10 seconds), and (3) Long soundbites (i.e., 30 seconds). Sound bites took the form of interview excerpts. Participants then listened to a news podcast corresponding with their sound bite condition.

The podcast was a re-recording of an Iowa public news segment that lasted roughly eight minutes. In this podcast, a host of issues were discussed, including political news, economic issues, and COVID vaccination updates.

After listening to the podcast, participants completed a 10-item quiz on the information presented in the podcast. Each participant then received a single score representing the total number of questions they got correct, which ranged from zero to ten. After completing this quiz, participants reported on other measures and their demographics.

Results

Our research question asked if there would be differences in quiz scores across sound bite condition. To explore this possibility, we first examined the condition means of each condition. Those who heard no soundbites scored an average of 4.62 ($SD = 2.10$), while those in the short sound bites condition scored an average of 4.64 ($SD = 2.53$). Those in the long sound bites condition scored an average of 4.96 ($SD = 1.93$).

To examine if these mean differences were meaningful we conducted an Analysis of Variance (ANOVA). The ANOVA did not detect a statistically significant difference among conditions, $F(2, 132) = 0.97$, $R^2 = .02$, $p = .73$. Therefore, there was no difference in quiz score based on the presence or length of sound bites in the podcast.

Discussion and Conclusions

Podcasts are a popular form of media among young adults for news and information (Bratcher, 2022) and are frequently used in teaching and learning in higher education contexts (e.g., Newman et al., 2021). In light of this information, the current study examined how podcasts may impact information retention and memory. We specifically focused on

how variations in sound bite length would impact memory and information retention. Our study was guided by a central research question: Does the inclusion of sound bites in news programming lead to increased information retention?

We used the limited model of mediated message processing (LC4MP) to guide our study. Participants were randomly assigned to one of three conditions that represented varying levels of sound bite lengths. They then listened to a podcast corresponding with their condition. After, participants completed a ten-item quiz on the information contained in the podcast. The higher the score of the quiz, the closer to a participant was to getting all ten answers correct.

An examination of condition means reveals that regardless of condition, all participants scored near the midpoint of the scale. While the long sound bites condition featured the highest mean score, an ANOVA revealed no differences among condition. Therefore, our results indicated that sound bite length did not impact information retention and memory of the information contained in the podcast.

Our failure to detect an effect may be explained by a few methodological decisions. First, it may be the case that our sample was underpowered and a larger sample may yield an effect. An examination of condition means does suggest a potential difference in conditions may exist, such that listening to long sound bites in a podcast would lead to enhanced memory and information retention, compared to other conditions. If there is a meaningful difference between conditions, a larger sample would allow for these differences to be detected in an ANOVA.

Second, it may be the case that our experimental conditions were not strong enough to detect an effect. In the current study, we used a podcast from Iowa, a state from which our sample does not reside. It may be the case that participants found the podcast less relevant to them, and thus, this perception drove our results. Relatedly, podcasts are frequently used in educational contexts, where students likely have their own clear educational goals (e.g., pass a test, earn an A in the class). In the current study, our participants likely did not have major goals related to the information contained in the podcast, and therefore were less motivated to retain the information contained in the podcast, regardless of condition. Future research should address this issue by perhaps providing participants with some type of incentive for listening to the podcast, thereby creating a clear goal in listening to the information.

Additionally, the current study looked at only the effects of sound bites using a single podcast; it may be the case that these effects are visible over an extended period of time. A longitudinal design, which exposes participants to sound bite podcasts over a period of time, may be a superior method to detect effects, should they be present. Studies in the future research should take these limitations into consideration.

Academic research on the effects of sound bites in podcasts on information retention and memory is quite limited. The current study begins to build a foundation for subsequent work examining the effects of sound bites on a host of educational variables. While in the current study, we failed to find evidence that the presence and length of podcast sound bites impacts information retention and memory, this does not mean that the use of podcasts is not an effective means of teaching and learning. In fact, it stands to logic that pairing a popular medium with an educational context is a unique, and likely effective means of enhancing teaching and learning.

References

Bennett, W. L. (2009). News: The politics of illusion (8th ed.). New York, NY: Pearson Longman.

Berry, R. (2006). Will the iPod kill the radio star? Profiling podcasting as radio. *Convergence*, *12*(2), 143-162.

Berry, R. (2015). A golden age of podcasting? Evaluating serial in the context of podcast histories. *Journal of Radio & Audio Media*, *22*(2), 170-178.

Bratcher, T. R. (2022). Toward a deeper discussion: A survey analysis of podcasts and personalized politics. *Atlantic Journal of Communication*, *30*(2), 188-199.

Chandler, C. C. (1994). Studying related pictures can reduce accuracy, but increase confidence, in a modified recognition test. *Memory & Cognition*, *22*, 273-280.

Chandler, P., & Sweller, J. (1991). Cognitive load theory and the format of instruction. *Cognition and Instruction*, *8*(4), 293-332.

Farnsworth, S. J., & Lichter, S. R. (2011). *The nightly news nightmare: Media coverage of US presidential elections, 1988-2008*. Rowman & Littlefield.

Fisher, J. T., & Weber, R. (2020). Limited capacity model of motivated mediated message processing (LC4MP). In J.V. den Bulck (Ed.), *International Encyclopedia of Media Psychology. Hoboken, NJ: Wiley Blackwell.*

Fulton, L. A. (2014). *Information retention of audio based public service announcements: The impact of messages created using different production methods*. Indiana University of Pennsylvania.

Hallin, D. C. (1992). Sound bite news: Television coverage of elections, 1968–1988. *Journal of Communication*, *42*(2), 5-24.

Lang, A. (2006). Using the limited capacity model of motivated mediated message processing to design -effective cancer communication messages. *Journal of Communication*, *56*, 57-80.

Lang, A. (2017). Limited capacity model of motivated mediated message processing (LC4MP). In A. Rossler (Ed.), *The international encyclopedia of media effects*, (pp. 1-9). Wiley.

Lichter, S. R. (2001). A plague on both parties: Substance and fairness in TV election news. *Harvard International Journal of Press/Politics*, *6*(3), 8-30.

Newman, J., Liew, A., Bowles, J., Soady, K., & Inglis, S. (2021). Podcasts for the delivery of medical education and remote learning. *Journal of Medical Internet Research*, *23*(8), e29168.

Pavolik, B. L. (2015). *News crawls and audience retention: A test of information overload in local television news programming*. Indiana University of Pennsylvania.

Rime, J., Pike, C., & Collins, T. (2022). What is a podcast? Considering innovations in podcasting through the six-tensions framework. *Convergence*, *28*(5), 1260-1282.

Rinke, E. M. (2016). The impact of sound-bite journalism on public argument. *Journal of Communication*, *66*(4), 625-645.

Ruiji, L. (2012). The development on multimedia teaching resources based on information processing theory. *International Journal of Advancements in Computing Technology*, *4*, 58-64.

Rumelhart, D. E., Lindsay, P. H., & Norman, D. A. (1972). A process model for long-term memory. In E. Tulving & W. Donaldson (Eds.), *Organization of memory,* Academic Press.

Schweppe, J., & Rummer, R. (2014). Attention, working memory, and long-term memory in multimedia learning: An integrated perspective based on process models of working memory. *Educational Psychology Review*, *26*, 285-306.

Sweller, J., Van Merrienboer, J. J., & Paas, F. G. (1998). Cognitive architecture and instructional design. *Educational psychology review*, 251-296.

Contact email: emily.dolan@sru.edu