

Multimodal Documentary Storytelling and Historical Memory Formation: The Mediating Role of Emotional Engagement

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Abstract

Increasingly, historical documentaries utilize multimodal storytelling techniques in order to tell complicated stories of the past; yet, little research has been conducted about the cognitive processes by which multimodal elements impact historical memory. The purpose of this study was to explore the connection between historical memory retention and multimodal documentary storytelling, paying particular attention to the mediating role of emotional engagement. Based on the Cognitive Theory of Multimedia Learning (CTML), this study employed a post-positivist quantitative design. Participants were randomly allocated into one of two experimental groups and asked to complete an online survey after viewing either a high- or low-multimodality documentary. The analysis of data involved descriptive statistics, independent samples t-test, reliability analysis, multiple regression, and PROCESS Macro Model 4 mediation analysis performed in IBM SPSS Statistics. It was found that participants in the high multimodality group experienced higher levels of emotional engagement compared to the participants in the low multimodality group. Emotions turned out to be positively related to historical memory retention. Mediation analysis indicated partial mediating effects of emotions, which means that the link between historical memory retention and documentary multimodality is partly explained by emotional engagement. Thus, historical memory is constructed not just due to multimodal documentary communication but also cognitive-affective engagement in it. The results, interpreted in accordance with CTML and Levels of Processing theory, contribute to the field of multimedia learning.

Keywords: multimodal documentary storytelling, emotional engagement, historical memory retention, historical learning, cognitive theory of multimedia learning (CTML)

1. Introduction

1.1 Multimodal Documentary Storytelling as a Medium for Historical Learning

Modern historical documentaries incorporate multimodal storytelling through the use of narration, archival images, musical scores, subtitles, graphic visuals, and sequencing of visuals in order to increase engagement with their audiences and aid the process of transmitting information about the past. Documentaries blend together elements of narrative structure, visual aesthetics, and emotions to influence the cognitive and emotional response of the audience, enhancing memory and understanding of historical and social phenomena (Bondebjerg, 2014). According to Tang (2018), documentaries incorporate observational shots, dialogues, and personal narration to create a story on an individual basis, thus inviting the viewer to identify with someone else's life story. The combination of visual observations, personal statements, and the setting creates the capacity for interpreting personal stories in a larger social context. Documentary films of historical events provide a key vehicle for communicating collective memory from one generation to another and allow viewers lacking direct experience of the events to consume their mediated forms (Kortti, 2022). Historical culture is a better concept than public history when looking at how documentary media affect memory and society's perceptions of history. Altogether, all these theories indicate that the educational value of historical documentary lies not only in the provision of factual information about the past but in its ability to turn complicated events into stories. The multimodal nature of the films forces the viewers to make sense of the historical reality in question, implying that the comprehension of history is achieved through mental and emotional engagement with the documentary. Therefore, the understanding of the mechanisms of creating emotional engagement through multimodality becomes a key issue here. Thus, multimodality becomes important not only because of the increase of information conveyed but also because of its effect on the interpretation and experience of historical content.

1.2 Emotional Engagement in Multimodal Historical Media

A combination of many different communication modalities in historical media may increase emotional engagement through attracting the audience's attention, increasing immersion in the story, and making their cognitive and affective involvement in the historical events stronger. A combination of the digital and physical worlds creates 'emotional hooks' and 'emotional layering', making it possible for learners to create emotional connections to the historical material (Sakr, Jewitt & Price, 2016). Emotionally rich experiences improve attention, engagement, and recall of the historical information. History-oriented immersive media encourage emotional engagement through combining multimedia experiences with strategies for improving learners' emotional and cognitive processing of the historical material (Nachtigall, Yek & Rummel, 2024). Furthermore, collaboration in learning after training in cognitive strategizing increases emotional processing, implying that instructional design tailored to the learners maximizes the benefits of immersive historical media. Mulders, Träg, Kaninski, Kirner and Kerres (2026) state that immersive historical media stimulate the development of the empathy and perspective-taking skills of their students, implying that emotionally rich learning contexts contribute to affective engagement with the historical story and not just the acquisition of factual information. Moreover, their research indicates that emotional engagement allows the viewers to relate to historical characters much better than they would do otherwise. The findings suggest that emotional engagement is an active learning process that allows people to interpret and relate to the historical stories on both cognitive and affective levels. Thus, emotions not only help to increase interest; they provide conditions that facilitate meaningful and deep interpretation, processing, and empathy. Therefore, it is important to understand how emotions affect the development of historical memory. These results place the involvement of emotions within the very process of meaning-making in history media as something intrinsic to it, as opposed to merely a desired result of viewing.

1.3 Emotional Engagement and Historical Memory Formation

In addition to inducing affective responses, emotional involvement plays a major role in influencing the way audiences learn and understand history. It helps museums build historical empathy through personal stories, artefacts, and multiple historical perspectives and provides evidence that effective historical understanding emerges from the interplay between cognitive and affective aspects of learning, and not just the acquisition of facts (Savenije & de Bruijn, 2017). The strength of the emotional experience was associated with the number of times memory was rehearsed, which is proof that emotionally charged experiences help form memories through frequent cognitive processing rather than through the process of emotion only (Tinti, Schmidt, Testa & Levine, 2014). Additionally, the study results show that media exposure and pre-existing knowledge increase memory accuracy and confidence. According to Eido (2025), methods such as narration, sound effects, music, and temporal sequencing are used to influence the thinking and emotional processes of viewers, suggesting that the use of emotionally charged narratives contributes to more profound comprehension and interpretation of historical events rather than passive viewing. Thus, all these opinions collectively mean that historical cognition is determined by the process of cognitive interpretation and emotional involvement rather than just information gathering. Emotionally engaged experience seems to contribute to reflective processes, improve the organization of the historical knowledge, and create strong representations in memory, which means that the meaningful comprehension of history is possible only due to cognitive-affective experiences. The literature therefore establishes a link between emotional involvement and memory processes, but it does not yet clarify how documentary form contributes to that relationship.

1.4 The Mediating Role of Emotional Engagement in Historical Memory Formation

Previous studies have examined each topic, namely, multimodal documentary communication, historical memory formation, and emotional engagement separately. Current research on the concept of immersive documentary also suggests that emotional engagement could be one of the factors through which multimodal documentary storytelling influences the retention of historical memory. VR documentaries are more immersive than regular documentaries; therefore, they increase both emotional engagement of the audience and the retention of historical stories (Dahdal & Nasar, 2025). The use of immersive storytelling about factual events increases the connection between the viewers, the historical events, and the virtual environment, and this improves the educational value of history learning through documentary. Research on history learning using digital literacy suggests significant improvement in the information processing skills of students, and the suggested model in those articles highlights the importance of investigating the mediators between history learning and education (Nurhasanah, Nadiroh & Maksum, 2025). First, immersive VR education for history promotes empathy and role-playing because it creates highly emotional experiences demonstrating that emotions can serve as an important channel through which historical media contribute to the educational process and meaningful learning, although there might not be any substantial increase in the acquisition of knowledge (Mulders et al., 2026). Second, multimodal communication as represented by verbal-visual storytelling promotes transformative learning because of its ability to evoke complex cognitive and emotional reactions that go beyond memory construction and result in greater involvement in historical stories (Sitzia & Gramond, 2026). Third, the research shows that emotions play a

critical role in the process of transformative learning because, through multimodal storytelling, people create meanings and engage relationally, connecting historical experiences with their identity and collective action. Taken all together, it may be stated that multimodal historical media use the combination of cognitive, emotional, and interpretive aspects of learning to provide educational benefits instead of relying on the technology itself or conveying information to the audience. Such convergence of findings demonstrates that emotions can not only be seen as desirable outcomes of learning but also serve as plausible mechanisms that explain the relationship between multimodal storytelling and the meaningful learning process and memory construction. Nonetheless, existing research largely examines immersion in media, engagement with tasks, or individual-level effects. The relation between multimodality in documentaries, emotional engagement, and history is less well-examined.

1.5 Research Gap

While previous literature has revealed the benefits of multimodal history media in education, the significance of emotional engagement in historical learning and the effects of affective experience on historical memory, little is known about the mechanisms through which such phenomena interact either independently or when embedded in immersive technologies like virtual reality. In other words, despite much research being available about each component separately, the mechanisms of emotional engagement as a psychological phenomenon that links multimodal storytelling in documentaries to historical memory retention are not well investigated empirically for the conventional form of documentaries. Additionally, in previous studies, attention has been focused on one of engagement, empathy, or learning but not on all three components in a single framework that allows investigating their interrelations at once. Hence, the purpose of the current study is to examine them empirically.

1.6 Research Aim and Hypotheses

This research aims to study how multimodal documentary storytelling influences historical memory retention and to examine whether emotional engagement mediates the relationship between documentary multimodality and historical memory retention among viewers. This research examines the relationship between multimodal storytelling and historical learning by analysing both its effects on viewers and the psychological processes underlying its emotional influence. . The study focuses not merely on the process of acquiring knowledge, but rather explains why multimodal documentaries help preserve historical memory. Accordingly, this research has set three hypotheses:

- H1: Higher multimodality significantly increases emotional engagement.
- H2: Emotional engagement positively predicts historical memory retention.
- H3: Emotional engagement mediates the relationship between multimodal documentary exposure and historical memory retention.

1.7 Rationale and Significance

Historical documentaries have become more and more multimodal by using narration, archival film, graphics, subtitles, and music; nevertheless, little attention has been paid to how multimodal storytelling contributes to historical learning. Existing research focuses on measuring the effectiveness of documentaries from the perspectives of knowledge acquisition or recall, but very little is known about the psychological processes that take place when creating historical memory. There is also little known about whether or not emotional engagement serves as the mechanism through which multimodal documentaries contribute to historical memory creation. This study seeks to fill this gap by examining the mediating role of emotional engagement in the relationship between documentary multimodality and historical memory. The study makes a novel contribution through its empirical placement of the role of emotional engagement as an intermediary mechanism that connects multimodality in the documentary to the preservation of historical memory. Rather than viewing the above three elements as independent results of the documentary form, the current research effort combines them into an empirical model that explains how the modality of the documentary can be connected with historical memory. This study is expected to contribute to the field of media psychology and multimedia learning because it brings together cognitive and affective approaches to documentary communication research. From the practical point of view, the findings may provide recommendations to documentary filmmakers and teachers about how to create effective historical documentaries that engage the public emotionally.

2. Methodology

2.1 Research Design

This research analyses the role of multimodal historical documentaries in the construction of historical memory through emotional engagement. Subjects were allocated at random into groups that will witness a high multimodality documentary (consisting of voiceover, archival videos, music, subtitles, and graphics) and a low multimodality documentary. Historical memory was measured using tests of recall and recognition. The level of emotional engagement was measured on a scale.

The research aims to determine whether emotional engagement serves as an intermediary in the relationship between documentary exposure and historical memory retention. The study identified ‘degree of multimodality in documentary presentation’ as the independent variable, with ‘emotional engagement’ as the mediator variable and ‘historical memory retention’ as the dependent variable in conducting the reliability analysis using Cronbach’s Alpha, simple linear regression, and PROCESS Macro Model for the mediation analysis using SPSS. “Alpha was developed by Lee Cronbach in 1951 to provide a measure of the internal consistency of a test or scale; it is expressed as a number between 0 and 1” (Tavakol & Dennick, 2011, p.53). To ensure the content validity of the survey, items in the survey were designed in such a way that there was a one-to-one correspondence between the constructs and hypotheses. The internal consistency of the measures was determined using Cronbach’s alpha, and all constructs had satisfactory to good reliability.

2.2 Philosophical Underpinning

The study is grounded in post-positivism, which claims that reality is independent of human perception but can be understood through systematic empirical research. Habib (2020, p.1003) claims that “the post-positivists, like the positivists, believe that there is a reality independent of our thinking that can be studied through the scientific method”. This position supports the use of a statistical research design to examine relationships between emotional engagement and historical memory retention of the viewers and documentary multimodality. To that end, the study adopts critical realist ontology to recognize these factors as real but indirectly measured phenomena. This creates an objectivist epistemology that acknowledges the unattainability of complete certainty, thus aligning with Maksimović and Evtimov (2023, p.213) to “reject the positivists’ narrow view that what could be studied was limited to what could be observed”. Such research philosophy recognizes latent psychological constructs as valid measures for investigation, thus inferring historical memory and emotional engagement through statistical survey. This epistemology ensured reduced researcher subjectivity and bias by using standardized measuring tools and systematic data collection and analysis processes. The results are not taken to provide definite answers; rather, they are interpreted as probabilistic answers based on empiricism, with room left open for possible error in the process of measurement.

2.3 Sampling

Proportionate stratified random sampling was adopted to improve representation across the strata within the university research participant community. In proportionate stratified random sampling, the population is divided into strata, and the sample members are drawn from each stratum in a proportionate manner. This helped to provide every eligible member with equal chances of being chosen, resulting in a representative sample (Iliyasu & Etikan, 2021). The sampling frame consisted of members from the university research participants community, which encompassed students from undergraduate and postgraduate levels, university faculty and staff members, alumni, as well as those involved in continuing education and public outreach initiatives associated with the university. Participants who met eligibility criteria were first stratified on the basis of gender, age, and educational level. After that, the members of each stratum were randomly sampled in proportion to the stratum’s size in the sampling frame. The members in the *final sample were assigned randomly to high or low multimodality documentary conditions.*

2.4 Research Measures, Instruments, and Data Collection

The data collection was done through a structured online questionnaire survey involving 120 respondents who were randomly allocated to either high or low levels of documentary multimodality. To evaluate the effect of multimodality on historical memory retention, the participants were asked to fill out a questionnaire containing demographic questions and a baseline test of their historical knowledge before watching the Terracotta Army documentary. Following the screening of the documentary, they filled out questionnaires measuring perceived multimodality, emotional engagement, and historical memory retention. The random allocation ensured that the differences in the results are attributed to the scale of multimodality in the documentary and not participants’ characteristics. The questionnaire was divided into five sections. The demographic information consisted of age, gender, educational qualification, how often the respondent watches documentaries, and whether he/she was previously familiar with the historical event. Baseline historical knowledge was tested using ten objective multiple-choice questions. Emotional engagement was evaluated using a 15-item five-point Likert scale addressing the issues of emotional interest, cognitive attention, emotional involvement, narrative transportation, and emotional impact. Perceived multimodality was tested using a 10-item five-point Likert scale and acted as a manipulation check. Finally, historical memory retention was tested using 20 objective questions, including ten recall and ten recognition questions, with a higher score indicating better memory retention. The internal consistency of the scales used for emotional engagement and perceived multimodality measurement was proven by excellent Cronbach’s alphas.

2.5 Data Analysis

Data analysis was done using the IBM SPSS Statistics software package. “SPSS offers a wide range of statistical tools and functionalities that can streamline data analysis processes, including data manipulation, descriptive statistics, and

hypothesis testing, and advanced statistical modeling” (Jain & Sengar, 2024, p.9529). Before proceeding to test the hypotheses, screening of the data set was done in order to ensure that the data is complete, appropriately coded, and consistent enough for statistical analysis. The composite scores were developed by calculating the mean values of multi-item constructs and the sum values of objective knowledge variables, thus reducing the number of variables in terms of their representational analytical value. Statistical tests were chosen based on the research questions and the conceptual framework of the study. Inferences were made to analyze the relationships between variables, differences between experimental conditions, and the mediation effect. Bootstrap procedures were used to gain confidence intervals of indirect effects. During statistical analysis, statistical significance was tested at a 95% confidence level ($p < .05$).

2.6 Ethical Considerations

Ethical principles relating to conducting studies on humans were observed during the research process. The relevant ethical committee approved the study before collecting any data. Participants freely took part in the study, and all of them gave their informed consent by having been made aware of the goals, procedure, and rights of participants of the study. Participants were made aware of the fact that they could choose to withdraw their participation at any point without any consequences. No personal details were collected, and thus no breach of confidentiality and anonymity occurred during the study. Responses to the questionnaire were kept safely on password-protected devices. Since the study required watching a non-offensive historical documentary and filling out a questionnaire, the study involved minimal risk to participants.

3. Findings

The findings or results of the quantitative data analysis are presented in this chapter. It starts with descriptive statistics, followed by the hypothesis testing of independent-samples t-tests, simple linear regression, and PROCESS Model 4 mediation analysis.

3.1 Demographic Profile of the Participants

Table 3.1. Demographic Characteristics

Variable	Category	n	%
Age	18–24	28	23.3
	25–34	36	30.0
	35–44	27	22.5
	45–54	20	16.7
	55+	9	7.5
Gender	Female	63	52.5
	Male	48	40.0
	Non-binary	9	7.5
Highest Educational Qualification	High School	9	7.5
	Diploma	14	11.7
	Bachelor's Degree	48	40.0
	Master's Degree	28	23.3
	Doctorate	21	17.5
Documentary Watching Frequency	Never	21	17.5
	Less than once per month	16	13.3
	1–3 times per month	23	19.2
	Once per week	27	22.5
	More than once per week	33	27.5
Previously Studied the Historical Topic	Yes	37	30.8
	No	63	52.5
	Not Sure	20	16.7
Familiarity with the Terracotta Army	1 (Not familiar at all)	25	20.8
	2	14	11.7
	3 (Moderately familiar)	44	36.7
	4	15	12.5
	5 (Extremely familiar)	22	18.3
Previously Watched a Documentary about the Terracotta Army	Yes	37	30.8
	No	83	69.2
Studied Ancient Chinese History	Yes	37	30.8
	No	83	69.2

The total number of participants in the study was 120. According to Table 3.1, the largest age group was 25–34 years ($n = 36, 30.0\%$), followed by 18–24 years ($n = 28, 23.3\%$) and 35–44 years ($n = 27, 22.5\%$). More than half of the participants

were female ($n = 63$, 52.5%), while 40.0% were male ($n = 48$) and 7.5% identified as non-binary ($n = 9$). In terms of educational level, most respondents had a Bachelor's degree ($n = 48$, 40.0%), followed by a Master's degree ($n = 28$, 23.3%) and a Doctorate ($n = 21$, 17.5%). Regarding the viewing of documentaries, 27.5% of participants said they watched more than once a week, whereas 22.5% said they watched once a week. More than half (52.5%) did not know anything about the historical topic before the study, and 36.7% were moderate on the familiarity with the Terracotta Army. In addition, 69.2% of the participants had never seen a documentary on the Terracotta Army nor studied Chinese Ancient history, which meant that the majority of participants had only limited prior knowledge about the topic and were appropriate for the purposes of this study.

Table 3.2. Baseline Knowledge Statistics

Variable	N	Minimum	Maximum	Mean	SD
Pre-test Historical Knowledge	120	0.00	10.00	6.60	3.91

Participants' baseline historical knowledge prior to watching a documentary was assessed through descriptive statistics. The results revealed that the mean knowledge score of the participants at pre-test was 6.60 ($SD = 3.91$) out of a total of 10, with a range of 0 – 10.

Table 3.3. Manipulation Check

Group	n	Mean	SD
Low Multimodality	51	2.341	0.540
High Multimodality	69	4.578	0.384

The manipulation check revealed that the participants in the High Multimodality condition rated significantly higher multimodality ($M = 4.578$, $SD = 0.384$) than the participants in the Low Multimodality condition ($M = 2.341$, $SD = 0.540$), Welch's $t(85.54) = -25.243$, $p < .001$. Thus, the manipulation was successful, suggesting that participants could successfully differentiate between the two types of documentary presentations.

3.2 Reliability Testing

Table 3.4. Reliability Analysis

Scale	Number of Items	Cronbach's α
Perceived Multimodality (Q34–Q43)	10	.991
Emotional Engagement (Q19–Q33)	15	.994

Table 3.4 shows that the perceived multimodality scale (10 items) exhibited good reliability (Cronbach's $\alpha = .991$) and the emotional engagement scale (15 items) also had very good reliability (Cronbach's $\alpha = .994$).

3.3 Hypothesis Testing

Table 3.5. Emotional Engagement Comparison

Variable	Group	n	M	SD	t	df	p
Emotional Engagement	Low Multimodality	51	2.29	0.67	-15.59	118	< .001
	High Multimodality	69	4.37	0.76			

To determine if there was any difference in emotional engagement between the groups who saw the low and high multimodality documentary presentations, an independent-samples t-test was performed (Table 3.5). The assumption of homogeneity of variances was not violated ($F = 1.00$, $p = .319$), and the equal variances assumed results were analyzed. The high multimodality group ($M = 4.37$, $SD = 0.76$) scored significantly higher on emotional involvement than the low multimodality group ($M = 2.29$, $SD = 0.67$), $t(118) = -15.59$, $p < .001$. These results support Hypothesis 1.

Table 3.6. Regression Analysis

Predictor	B	SE	β	t	p
Constant	0.932	0.733	—	1.272	.206
Emotional Engagement	3.768	0.198	.869	19.064	< .001
Model Statistics					
$R = .869$, $R^2 = .755$, Adjusted $R^2 = .753$, $F(1, 118) = 363.426$, $p < .001$					

The regression coefficients in Table 3.6 revealed that emotional engagement was a significant ($B = 3.768$, $t = 19.064$, $p < .001$) and positive predictor of historical memory retention. This suggests that the historical memory score rose by about 3.77 points for each point increase in emotional engagement. The overall regression model was significant, $F(1, 118) = 363.43$, $p < .001$, and approximately 75.5% of the variance in the factor Historical memory score was explained by the model ($R^2 = .755$; Adjusted $R^2 = .753$). Thus, Hypothesis 2 is supported.

3.4 Mediation Analysis

Table 3.7. Mediation Analysis

Effect	B	SE	t	p	95% CI
Direct Effect (ExpGrp → HistMem)	5.392	0.727	7.416	<.001	[3.952, 6.832]
Indirect Effect (ExpGrp → EmoEng → HistMem)	4.219	1.573	—	—	[2.123, 8.411]
Outcome Variable	R	R ²	F	p	
Emotional Engagement	.821	.673	243.145	<.001	
Historical Memory	.913	.833	292.364	<.001	

Table 3.7 presents the results of the mediation analysis that was carried out using PROCESS Macro Model 4 with 5,000 bootstrap samples. The statistical significance of the model predicting emotional engagement from the experimental group was $R^2 = .673$, $F(1, 118) = 243.15$, $p < .001$, which means that 67.3% of the variance in emotional engagement was explained by the model. The final model for predicting historical memory retention was also statistically significant ($R^2 = .833$, $F(2, 117) = 292.36$, $p < .001$), with 83.3% of the variance in historical memory explained. The direct effect of experimental group on historical memory retention remained significant ($B = 5.392$, $SE = 0.727$, $t = 7.416$, $p < .001$, 95% CI [3.952, 6.832]). Furthermore, the indirect effect via emotional engagement was significant ($B = 4.219$, $BootSE = 1.573$, 95% Bootstrap CI [2.123, 8.411]). Thus, Hypothesis 3 is supported.

4. Discussion

4.1 Higher Multimodality Significantly Increases Emotional Engagement

It can be concluded that increasing the degree of multimodal richness in storytelling in documentaries results in higher levels of emotional engagement of the viewers, thus suggesting that the impact of historical documentaries does not simply rely on the historical information they convey but also on their modality. The participants who watched the high-multimodality documentary demonstrated significantly higher emotional engagement than the viewers of the low-multimodality version. The current research supports the Cognitive Theory of Multimedia Learning (CTML), which states that meaningful learning is achieved by the selective, organizational, and integrative processes of information processing through the verbal and visual channels of perception. Mayer and Moreno (1998, p.359) argue that “the learner engages in three important cognitive processes”, namely, the processes of selection, organization, and integration of information. Even though the results coincide with CTML, the results should still be approached with caution. In the current experiment, the two versions of the documentaries were compared, one of them being a high multimodality documentary and another one being a low multimodality version; hence, the differences in emotional engagement cannot be explained through multimodality alone. The differences in such characteristics of the documentary stimulus as narration technique, speed, editing, music, or even its general production quality could have contributed to the differences.

Therefore, what the current research suggests is that the high multimodality documentary in question engaged viewers on an emotional level more effectively than its counterpart, but not all increases in multimodality would necessarily result in the same effect. Nonetheless, the current results are congruent with the previously obtained empirical evidence regarding multimodality and audience engagement. Earlier research indicated that multimodal historical media help create emotional hooks and layers that lead to greater engagement with the media on the part of the audience (Sakr et al., 2016); additionally, immersive historical media are conducive to perspective-taking, empathy, and emotional involvement with historical stories (Mulders et al., 2026). Likewise, when documentary narratives combine visual observations with personal narratives, they invite the audiences to relate to the historical events (Tang, 2018). The current results add to the above-mentioned corpus of research in that they provide numerical evidence for these relationships. A simplistic inference could argue that documentary videos are emotionally engaging due to a larger number of audiovisual features. Modern trends in CTML reinforce this understanding in that meaningful learning happens when the learner performs appropriate cognitive processing by selecting, organizing, and integrating the information (Mayer, 2024). Even though the concept of CTML was initially formulated in relation to multimedia learning in educational contexts, it can also be used effectively as a theoretical basis for the analysis of emotions in documentary communication.

Despite the fact that CTML suggests that effective multimedia learning could help optimize the process of learning through the use of the cognitive processing process, this experiment did not measure cognitive load, coherence, and information integration. These processes should thus be considered theoretical frameworks that complement the results. The historical documentaries portrayed a distinction from regular teaching resources in the sense that they are intended both to inform and engage the audience emotionally. Verification of Hypothesis 1 is important not only for explaining the process of emotional engagement but also for understanding how historical documentaries impact audiences. An integrated understanding of these observations suggests that multimedia learning theory can provide a helpful theoretical foundation for analyzing the effect of multimodal documentary communication on audience engagement. Though this study fails to identify what particular aspects of the documentary contributed to this effect and what particular mental

processes were involved, the empirical data confirm that exposure to the high-multimodality documentary resulted in more emotional engagement than in the case of the control one. In addition to confirming the practical significance of the designed documentary, this finding reveals the necessity for future research into the role of particular multimodal aspects and their effects on the audience.

4.2 Emotional Engagement Positively Predicts Historical Memory Retention

It can be stated that emotional engagement was a crucial positive predictor for the variable of historical memory retention. However, it is crucial to recognize that the regression analysis reveals a correlation between these two variables and does not establish causation. Therefore, the findings show that individuals who reported greater emotional engagement were inclined to report better memory retention of historical facts following the documentary viewing. It is vital to acknowledge that in the current research, emotional engagement should not be considered a pure emotion-related variable. Since the measure included such aspects as emotional response, attention, narrative transportation, and cognitive engagement, this concept describes the holistic psychological experience where both affective and cognitive processes take place simultaneously. It is a more adequate explanation of the discovered statistical connection than considering emotions as a separate phenomenon. The results may be explained using the Cognitive Theory of Multimedia Learning (CTML), although it is necessary to consider the fact that CTML provides an explanation of cognitive conditions for learning but does not claim that emotional engagement is a cause of deeper processing. According to CTML, meaningful learning takes place when a learner selects relevant information, organizes it, and integrates it with prior knowledge from long-term memory (Mayer, 2024). As a result of this, the emotional involvement may suggest that the participants paid more attention to the documentary content and were more involved in the process of creating a meaningful understanding of the events.

In this respect, the current results are consistent with the principles of the CTML but stay within the limitations of the correlational data that can be obtained with the help of regression analysis. This hypothesis can also be supported by the fact that the Levels of Processing framework. Unlike the traditional models of memory that assume separate systems responsible for storing information in memory, Craik & Lockhart (1972) suggested that memory is determined by the depth of processing at the stage of encoding, and the deeper the analysis of meaning, the better and longer lasting the memory traces. According to their model, the performance of the task does not depend on the amount of information provided but rather on the degree of interpretation of this information. Based on this concept, viewers who showed higher levels of emotional engagement may have performed deeper semantic processing of the documentary content, leading to better historical memory. Later research that has been done based on the Levels of Processing theory supports such an explanation through the assertion that successful remembering relies on encoding and elaboration of material as well as integration with previous knowledge rather than mere exposure to the information. According to Craik (2002), deeper encoding will result in more elaborated and distinct representations and hence improve the accessibility of information during retrieval. Emotional engagement of viewers with historical documentaries may lead to the construction of elaborated interpretations that incorporate the meaning of the information provided in documentaries with their previous historical knowledge, which facilitates subsequent recall. However, the current study cannot make claims that emotional engagement leads to such encoding and elaboration processes, as the latter was not measured in the study. Therefore, it can be concluded that emotional engagement should be seen as a component of an educational process and not as emotional arousal only. Historical documentaries are structured in a way that makes viewers pay attention to both the facts and the meaning of the historical information provided.

The regression analysis shows a significant correlation between emotional engagement with documentary narratives and better historical memory recall. This finding does not mean that emotions improve memory; rather, it means that emotional engagement is associated with cognitive processes in the context of documentary narratives that make information personally meaningful for participants. At the same time, it is necessary to take into consideration some limitations that can impact this relationship interpretation. First, emotional engagement was analyzed after viewing, not being a manipulandum in this study and, therefore, making it unclear whether emotional engagement causes better memory or vice versa. It can be assumed that people who remembered more from watching the film reported greater emotional engagement, which is why regression was used to determine their relationship. Secondly, pre-existing knowledge on the topic was studied but not added to the regression analysis. Familiarity with the Terracotta Army, previous experience with documentaries, and differences in educational background might influence post-viewing results regardless of emotional engagement. Thus, it is essential to take into consideration that the prediction found in this study cannot be generalized before incorporating all those variables in future research. The results of the study also show that CTML theory alone is insufficient in terms of historical memory formation. Although CTML explains the ways in which multimedia facilitates meaningful learning, another theory, Levels of Processing, can supplement this perspective in explaining the role of semantic elaboration and durable encoding in memory formation. Taking all of this into consideration, it becomes clear that historical memory will be formed when people interpret the documentary's narrative and become emotionally engaged in historical experiences described in the video. Therefore, confirming Hypothesis 2 means that emotional engagement is an important predictor of historical memory retention in multimodal documentary learning.

4.3 Emotional Engagement Mediates the Relationship Between Multimodal Documentary Exposure and Historical Memory Retention

The findings show that emotional engagement plays the role of a mediator between multimodal documentary storytelling and memory of historical events, suggesting that storytelling techniques are not sufficient for achieving sustainable learning effects without evoking psychological engagement of the viewers. In contrast to being used as an independent predictor of memory retention and historical memory, emotional engagement becomes the tool that allows translating audiovisual storytelling into meaningful historical experience. This conclusion goes beyond the conclusions of Hypotheses 1 and 2 as it reveals the idea that the efficiency of multimodal documentaries is not limited to their ability to evoke viewer engagement and improve memory; it relies on the sequential interaction of these factors. Therefore, emotional engagement can be treated as the interpretative mediator between the process of narrative storytelling and historical learning. From the results of the mediation analysis, it can be concluded that there is no complete but rather partial mediation since the direct effect of multimodal documentary storytelling on historical memory stays statistically significant despite the introduction of emotional engagement within the analysis. Therefore, one may assume that the emotional factor mediates only a certain proportion of the link between the independent and dependent variables, while other factors mediate the rest. These findings confirm the notion that historical documentaries achieve maximum educational effect if they use emotional involvement as a way to help the audience internalize the narratives rather than watching them as detached from viewers' experiences. At the same time, the results show that effective historical learning requires something more than access to correct historical information since viewers build up historical meaning based on their reaction to the narratives. Multimodal storytelling creates the structural context that enables capturing viewers' attention due to the use of narration, archival materials, interviews, sound, music, and visualization. However, these elements acquire educational meaning only when they help viewers make a personal connection with historical experience. In other words, these results show that emotional engagement helps to transform externally provided historical information into knowledge, because it prompts viewers to interpret the event in a historical, cultural and human context.

As opposed to the view that emotional engagement is a result of documentary techniques, the findings of this research consider it to be an interpretive process through which viewers make sense of the significance of historical events, causes of events, and the integration of documentary material into viewers' historical knowledge. Hence, the mediating effect suggests that historical memory retention is associated not only with information transmission but also with the interaction between narration and individual meaning-making. Despite statistical consistency of the mediation analysis with this model, however, the variables of historical memory and emotional engagement were measured after the same viewing of the documentary in one data collection round. This means that the empirical evidence corroborates the hypothesized mediating effect but does not prove the sequence in which emotional engagement occurs before gains in historical memory. In such a way, emotional engagement becomes a tool that promotes the development of documentary storytelling not only as a means of information sharing, but also as historical interpretation. The current findings show that multimodal documentary storytelling has some educational value since it provides viewers with the opportunity to get emotionally engaged in historical experiences that are shown in it. Despite the fact that historical documentaries usually combine factual information and narratives about historical events to create a picture of the event in the past, the current findings show that the presence of narrative richness or factual density does not lead to increased historical memory. This means that documentary techniques become educational only in cases when viewers get emotionally involved in the historical experience represented in it. This way, it becomes possible to connect individual historical events to larger historical processes, rather than keep specific facts in mind. In other words, the emotional engagement seems to make the history learning more effective due to the fact that the audience organizes documentary information into meaningful explanations which can be understood afterwards. Hence, the mediation results suggest that emotional engagement does not simply accompany the historical learning process, but it becomes a crucial factor which allows documentary stories to gain educational meaning. It is also worth noting the importance of an indirect relationship established in the course of this research for the evaluation of the educational effect of historical documentaries in general.

Traditionally, historians and educators tend to measure the success of historical documentaries with such criteria as historical accuracy, completeness of the story, or production quality. Nonetheless, the results of this study suggest that these factors are not sufficient to explain different levels of historical memory formation, since they do not take into consideration the level of emotional engagement of the audience with the documentary story. The role of emotional engagement lies in the fact that it is the mediator through which the documentary format obtains its educational significance and shows that the formation of historical memory happens through the experience of the audience's engagement in documentary narration and not through the information contained in these documentaries. In this way, it becomes clear why documentaries employing the same historical material can lead to such different educational results due to the level of emotional engagement they create. On the whole, the verification of Hypothesis 3 gives a more complete understanding of how multimodal documentary storytelling helps people learn history since it reveals the role

of emotional engagement as the connection between the way the story is told and historical memory that emerges as a result. The mediating role connects all the hypotheses and provides an explanatory framework according to which the techniques used in historical documentaries make people involved in what is going on, and then their involvement leads to better memory of historical facts. Instead of considering emotional engagement either as the result of viewing the document or as the independent variable, the results suggest that it is the key factor in terms of the way historical documentaries help people learn history.

5. Conclusion

This study examined how multimodal documentary storytelling influences historical memory retention by investigating the mediating role of emotional engagement. The findings confirmed that greater multimodality significantly enhanced emotional engagement, emotional engagement positively predicted historical memory retention, and emotional engagement partially mediated the relationship between multimodal documentary storytelling and historical memory retention. Together, these findings demonstrate that effective historical learning extends beyond information delivery to include the psychological processes through which audiences engage with documentary narratives. However, such results need to be considered within the limitations of the experiment's design, since the experiment shows that the particular condition of high multimodality resulted in more engaging effects and better memorability, but the psychological factors behind this connection have yet to be proven theoretically. The findings collectively suggest that the educational effectiveness of historical documentaries may depend not solely on the quantity or accuracy of historical information presented but also on the extent to which multimodal communication facilitates meaningful cognitive-affective processing. Rather than functioning as independent audiovisual elements, narration, archival footage, graphics, subtitles, and music operate as an integrated communication system that encourages viewers to organize, interpret, and emotionally connect with historical narratives. The mediation analysis further suggests that emotional engagement may represent an important psychological mechanism linking multimodal storytelling with historical memory retention.

Such a result shifts the analysis of documentaries away from production standards and factual accuracy to the role of communication design in shaping learning experiences. From a theoretical perspective, the research expands the Cognitive Theory of Multimedia Learning (CTML) by confirming the strong ties between cognitive mechanisms of multimedia learning and emotional involvement in documentary-based historical education. Concerning the integration of Levels of Processing Theory, the results suggest that historical memory is related to the involvement of something emotional and semantically elaborate and not simply the media through which information is conveyed, even though partial mediation does not necessarily prove temporal causality. Thus, the research expands the scope of the applicability of CTML beyond instructional settings, as emotional involvement emerges as an inherent part of meaningful multimedia learning rather than a consequence of learning processes. Practically speaking, the research provides quantitative support for the mediating role of emotional involvement in the connection between documentary multimodality and historical memory. Such a contribution fills the gap in the current knowledge regarding the topic. In addition, the results have practical value for documentary filmmakers and educators of history, as the research suggests that a properly constructed multimodal strategy may contribute to emotional involvement and better historical memory.

5.1 Limitations

This study has several limitations. First, the sample was drawn from a single university research participant community, which may limit the generalizability of the findings to broader populations with different educational or cultural backgrounds. Second, historical memory retention was measured immediately after documentary exposure, preventing assessment of long-term memory retention. Third, the study examined only one historical documentary on the Terracotta Army, and the findings may not be directly applicable to documentaries covering different historical topics or employing alternative storytelling styles. Future research should adopt more diverse samples, documentary genres, and longitudinal research designs.

5.2 Scope for Future Research

Future research should examine the proposed mediation model across different historical documentary genres, cultural contexts, and audience groups to enhance its generalizability. Longitudinal studies could investigate the durability of historical memory over time, while future models may incorporate additional mediating or moderating variables, such as historical empathy, prior knowledge, or narrative transportation, to provide a more comprehensive understanding of documentary-based historical learning.

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Author contributions

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Ali. Data Collection: Xiaomin Mao. Data Analysis: Xiaomin Mao, Dr. Mohd. Nor Shahizan Ali. Writing - Original Draft Preparation: Xiaomin Mao. Writing - Review and Editing: Dr. Mohd. Nor Shahizan Ali, Dr. Normah Mustaffa. Visualization: Xiaomin Mao. Supervision: Dr. Mohd. Nor Shahizan Ali, Dr. Normah Mustaffa.

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