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The Effects of Auditory and Audiovisual Input on Listening Comprehension and Writing Accuracy of EFL Students: Focusing on Students' Perceptions of Input Modality

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Abstract

The current study was conducted to examine Iranian EFL students' listening comprehension and writing performance after receiving auditory and audiovisual input. With a quasi-experimental test-retest design, a listening comprehension test was administered in auditory and audiovisual formats to 51 intermediate EFL students from two intact classes. The results indicated that the students' mean scores in the audiovisual listening test were significantly higher than that in the auditory test administered after a six-week interval; however, no significant difference was found in the accuracy and fluency of summary writing. The analysis of the participants' responses to the questionnaire indicated that 75% of the students preferred the video format of the test and only 22% found it distracting. Most participants believed that visual input helped them remember details for a longer period and stay more concentrated, engaged and interested in the topic. To conclude, in addition to auditory input, audiovisual material is recommended as a preferred instrument to assess learners' listening comprehension.

Keywords: *accuracy, auditory/audiovisual input, fluency, listening comprehension, perception*

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1. Introduction

Among the four language skills, listening comprehension is the most challenging and implicit skill to investigate in second language research (Vandergrift, 2011). Spoken discourse involves more than just sound (Buck, 2001) and efficient listening requires complex linguistic and non-linguistic processes (Cross, 2018). To address this challenge, teachers should offer attractive and high-quality materials to enhance the teaching process (Ismaili, 2013). Consequently, there is a growing tendency among educators to use audiovisual input instead of traditional auditory texts in teaching and testing listening skills (O'Bryan & Hegelheimer, 2007).

For comprehending spoken input, listeners use linguistic, pragmatic, prior and discourse knowledge in order to process what they hear in the input (Vandergrift & Goh, 2012). The use of video makes listening more authentic by presenting context, discourse, paralinguistic features, and culture. These non-verbal cues, when combined with aural input, aid listeners in comprehension (Coniam, 2001). According to DeKeyser (2015), second language acquisition results from the interaction between learners' internal mechanisms and the input they receive. The saliency of this input, whether auditory or audiovisual, plays a significant role in this process.

Although numerous studies have compared learners' listening comprehension with auditory and audiovisual formats, the results are inconsistent; in fact, there are insufficient studies investigating why one format might lead to superior performance (Ginther, 2002; Gruba, 1997; Ockey, 2007; Suvorov, 2008). It is not clear whether practising a specific skill, like listening, can lead to improvements in other skills, such as writing and speaking (Li & DeKeyser, 2017). There appears to be a dearth of research on the role of input modality in EFL listening comprehension and writing performance (e.g., taking notes and writing summaries). A key assumption is that the accuracy and fluency of production reflect the degree of acquisition. Ensuring writing accuracy and fluency, which involves the correct and precise use of language within the designated time, is crucial for clear and effective communication. It guarantees that the intended message is delivered without misunderstanding or ambiguity.

The current study, therefore, aimed to compare the effect of testing input (auditory and audiovisual) on listening comprehension and writing accuracy of EFL students. Most of the related studies employed one text type, for example, monologue, conversation or lecture (Basal et al., 2015; Conaim, 2012; Ismaili, 2013), and one type of test item, i.e., multiple-choice format (Batty, 2015; Basal et al., 2015; Conaim, 2001; Wootipong, 2014 Shabani et al., 2018). The current study tries to fill these gaps by employing various text types and test items and examining their effects on students' comprehension and written production.

A second aim of the study was to investigate the perceptions of students towards these two formats. It is not clear how students perceive the clarity of input in the two formats. A student's perception of a test format involves how they interpret the items, and how they process the information presented in the auditory and audiovisual formats. Their perception in this particular

context can vary based on several factors including learning preferences, cognitive load, engagement, and comprehension. These are the issues that will be considered in the current study.

2. Review of Literature

2.1. Theoretical Perspective

Theories of attention, particularly filter theories, propose a limited capacity for processing information, where different stimuli compete for attentional resources. Wickens (1984, 1989) expands on this by suggesting multiple resource pools rather than a single pool. These pools are situated at special points within three intersecting dimensions of the resource system: (1) perceptual/cognitive activities versus response processes, (2) processing codes essential for analogue/spatial activities versus verbal-linguistic activities, and (3) processing modalities, including auditory versus visual perception and vocal versus manual responses.

According to Wickens' theory, tasks that draw from the same resource pool compete for resources, thereby increasing their difficulty and attentional demands. Applying this to audiovisual materials in teaching or testing, suggest that combining audio and video may intensify the difficulty of tasks and significantly strain attentional capacity (Wickens, 1984, 1989). These insights into attentional resources lead us to consider another influential framework: *cognitive load theory*.

Cognitive load theory (Sweller, 2005) emphasizes the interplay between working memory and long-term memory and how their relationship impacts learning and problem-solving. This theory views human cognition as a natural information processing system and suggests that presenting the same information in various formats can create an extraneous cognitive load, hindering learning due to the mental effort required to coordinate these multiple forms (Sweller, 2005; Fraser et al., 2015).

Contrary to the cognitive load theory, the *dual coding theory* by Clark and Paivio (1991) posits that the human mind processes visual and verbal information through separate channels, allowing distinct processing, sorting, storage, and retrieval of visual and verbal codes. The verbal system handles linguistic input, while the visual system is dedicated to nonlinguistic information. This dual-channel approach enhances understanding when learners are exposed to both visual and verbal input (Sadoski & Paivio, 2004).

Adopting these theories, Mayer (2014) introduced the cognitive theory of multimedia learning (CTML) based on three main assumptions: humans make use of distinct systems for processing visual and verbal information (dual-channel assumption), each system can only handle a limited amount of information at once (limited-capacity assumption), and meaningful learning requires actively linking visual and verbal information (active-processing assumption). The theory also considers cognitive overload, which occurs when the learner's cognitive demands exceed their available capacity.

It is to be mentioned that using audio and video materials integrates top-down and bottom-up processing, playing a significant role in listening comprehension. Top-down processing uses background knowledge to interpret the main idea, while bottom-up processing relies on incoming input. Effective comprehension involves combining these processes to create a mental representation of the message (Hulstijin, 2003; Vandergrift, 2007). For second language learners with limited linguistic knowledge, utilizing all available resources through top-down processes is vital. In general, effective listening strategies, including compensatory mechanisms that draw on contextual, visual, or world knowledge, significantly enhance listening achievement (Vandergrift, 2006). Therefore, incorporating video with audio materials likely leads to a more comprehensive understanding of information.

2.2. Empirical Studies

Considerable research has been conducted to explore the impact of audio versus video materials on listening comprehension and assessment, presenting a mixed but nuanced view of their effectiveness and student preferences. The studies by Sulaiman et al. (2017), Woottipong (2014), Progosh (1996), Rahmatian and Armiun (2011), Sarani et al. (2014), Ginther (2002), and Progosh (1996) collectively highlight the positive impact of video materials on listening comprehension and assessment.

Sulaiman et al. (2017) found that audiovisual methods resulted in higher scores compared to auditory method. They attributed this to the authenticity and meaningfulness of video texts, which present real-life situations and language contexts. Woottipong (2014) demonstrated that video materials significantly improved the listening skills of Thai university students, as indicated by pretest-posttest comprehension tests. Students also had positive attitudes towards using videos to teach listening skills.

In the Iranian context, video materials were found to enhance the accuracy of listening comprehension significantly, aiding in guessing and anticipating the message better than audio alone (Rahmatian & Armiun, 2011). Sarani et al. (2014) also found that video-based tasks significantly improved listening comprehension skills in Iranian pre-intermediate EFL students. The researchers explained that the presence of body language and facial expressions during communicative acts played a crucial role in scaffolding understanding.

The two studies by Ginther (2002) and Progosh (1996) further explored students' preferences for auditory or video materials. Despite hypothesizing that context-based visual stimuli might be distracting, Ginther (2002) found that visuals facilitated performance, and participants preferred having visuals during listening tasks. Similarly, in Progosh's (1996) study, participants expressed a strong preference for video in listening comprehension tests based on their positive perceptions, as evidenced by a questionnaire.

Jones (2003) and Jones and Plass (2002) examined the *multimedia learning theory* and explored the scenarios in which multimedia could contribute to supporting second language listening comprehension. The study supported the generative theory, showing that students had better memory for word translations and passage recall when they had access to both verbal and visual elements during listening. Interviews confirmed that combining visual and verbal annotations helped students grasp the presented material better. These studies, while insightful, relied on a small sample size which may limit the generalizability of the findings. Additionally, the study did not control for participants' prior exposure to multimedia learning, which could have influenced the results.

On the other hand, some limited studies indicated mixed or negative findings on video materials (Conaim, 2001; Cubilo & Winke, 2013). Conaim (2001) conducted a study involving English language teachers in Hong Kong, where both audio and video versions of the same listening test were administered. Statistical analysis revealed no significant difference in scores between audio and video test groups. However, some participants in the auditory test group expressed a preference for video. Conversely, some audiovisual participants found video distracting, as they had to shift their attention between the question paper and the screen.

Finally, some studies indicated a better performance with audio material (Basal et al., 2015; Najafi et al., 2019). Using a posttest-only control group design, Basal et al. (2015) explored the impact of audio and video formats in a listening test. They reported that the auditory test group outperformed the video test group, though they acknowledged the potential influencing factors, such as motivation, physical conditions, familiarity with the topic, note-taking habits, and initial preferences for audio or video. Similarly, Najafi et al. (2019) found that audio input reduced listening fatigue, and resulted in superior performance compared to the video-audio group. Qualitative data from oral interviews indicated learners' positive attitudes towards the audio input to improve EFL listening comprehension and reduce listening fatigue.

Research on the impact of visual support on listening comprehension and writing skills, though very limited in number, has yielded valuable insights (Cubilo & Winke, 2013; Kamariah, 2018; Mueller, 1980). These studies highlight the benefits of incorporating visual aids in educational contexts to support comprehension and writing skills. Mueller (1980) compared auditory and audiovisual listening tests, hypothesizing that visual material would enhance comprehension by providing contextual cues. His study showed that visual aids benefit less proficient learners, particularly with difficult texts, supporting the notion that listening comprehension involves a complex interplay of linguistic and contextual cues.

Cubilo and Winke (2013) examined the impact of visual support on listening comprehension and note-taking strategies and integrated writing task performance among international students at Michigan State University. They found no significant difference in overall performance between video and auditory listening passages, though there were differences in note-taking strategies, with fewer notes during video formats, suggesting a higher cognitive

load. Participants found video tasks more challenging yet helpful for comprehension. Kamariah (2018) explored the use of video as an authentic material to enhance students' writing abilities. Using a quasi-experimental design, she found significant improvement in the narrative writing skills of students who used video materials compared to those who did not. These studies highlight the benefits of incorporating visual aids in educational contexts to support comprehension and writing skills.

While several studies demonstrate that video materials can enhance listening comprehension and are generally preferred by students, some research indicates no significant difference or even better performance with audio materials alone. Based on the reviewed literature, further research is required to explore these inconsistent findings. Factors such as context, individual preferences, and specific conditions of the learning environment may play a critical role in determining the effectiveness of video versus audio in listening comprehension. These factors must be examined from the learners' perspectives during or after they are exposed to auditory and audiovisual input.

Research on the effects of auditory and audiovisual input on listening comprehension and writing accuracy has several practical implications for educators and policymakers. The findings of this study can guide the development of instructional strategies by incorporating audiovisual materials and providing context and visual cues that support understanding and retention. Insights from this research can inform curriculum designers to include balanced auditory and audiovisual elements and educators to develop multimedia tools and platforms (e.g., language learning apps, interactive software) that integrate auditory and audiovisual inputs in language courses.

To explore how input modality influences EFL students' listening comprehension and writing performance, the current study raises the following research questions:

1. Is there a significant difference between types of input- namely auditory and audiovisual- in an L2 listening test in terms of their effect on EFL students' performance in listening comprehension?
2. Is there a significant difference between types of input- namely auditory and audiovisual- in an L2 listening test in terms of their effect on EFL students' writing accuracy and fluency?
3. How do participants perceive the effects of auditory or audiovisual listening tests on their comprehension, as reported in the questionnaires?

3. Methodology

3.1. Participants

In this study, fifty-one students from the Teaching English as a Foreign Language (TEFL) and English Literature BA programs at the University of Mazandaran were selected using convenience sampling. The participants were aged 18 to 21 years, with an average age of 19.5 years, and comprised 36 females and 19 males. None of the participants had lived in an English-

speaking country or studied the listening materials from "New Interchange, Level 3" (Richards, 2011). This ensured a homogeneous group in terms of linguistic environment, enhancing the study's reliability by controlling for external variables that could affect the research outcome.

3.2. Computer-assisted Classroom Setting

The research took place in the computer lab of the Language Department at the University of Mazandaran. Each computer in the lab, which operated on Windows 7, had X-class software installed, and the teacher's central computer could access to all units. Each workstation was equipped with a monitor and headphones, allowing participants to individually view video clips and listen to the passages and questions broadcast from the central computer by the researchers.

3.3. Materials and Instruments

The study utilized a quasi-experimental design involving two testing sessions based on time-series and test-retest method. A computerized listening test was administered, consisting of four listening texts and 20 multiple-choice items (six for the first text, seven for the second, and seven for the third). After the listening test, students were required to write a summary of the content from the final listening text to evaluate their writing performance. To determine participants' test modality preference, a validated post-test questionnaire (adapted from Suvorov, 2008) was given in the final stage of the study. The questionnaire included 10 open-ended and Likert scale items, to gather participants' opinions on the usefulness of the materials, their preference for auditory or video-audio tests, and their perceived difficulty of the test input.

3.4. Procedure

In the first session of the study, students underwent training using a test format identical to the main test but with different passages. The session was aimed to prepare students for the main study and to pilot test difficulty and timing for answering questions and writing summaries. The research employed a test-retest methodology, administering the same test to the group twice in an auditory format and once in an audiovisual format- with a six-week interval between tests.

Students answered questions related to the initial three listening texts after a procedural explanation. The tests, conducted using X-class software in a language lab, included interviews, a monologue, and a lecture. The questions for these texts consisted of multiple-choice, fill-in-the-blank, and short-answer formats. The listening passages, selected from the "Interchange 3" video resource book, covered different topics such as business, history, children's education, and sports, requiring no prior specific knowledge. The lengths of these passages were 3, 3, 6, and 5 minutes, respectively.

Each item was displayed on the screen for 30 seconds, and students could not revisit previous items. For the fourth text, students were asked to write a summary within seven minutes.

During the video session, participants had access to both video and audio for each section. After completing all four tests, they responded to a questionnaire, adapted from Suvorov (2008), to share their views on the auditory and audiovisual listening tests.

3.5. Data Analysis

The study examined differences in students' listening comprehension between two testing modes by calculating and comparing mean scores using a paired samples t-test. Writing performance was evaluated by separately calculating and comparing mean percentages of participants' fluency and accuracy rates, also using paired samples t-test analysis. Fluency was measured by multiplying the number of words produced in one second by 100, and accuracy by dividing the number of correct words by the total words produced in the summary writing, then multiplying by 100 (Ellis & Barkhuizen, 2005). Additionally, the participants' responses were analyzed and presented to address the third research question.

Analyzing questionnaire responses involved distinct approaches for open-ended and Likert scale items. Open-ended responses (items 8, 9, 10) were analyzed qualitatively through coding schemes that involved reading through all responses to get an overall sense of the data. The next steps involved identifying themes, and interpreting results. Likert scale responses (Items 1, 4, 6) were analyzed quantitatively using statistical methods such as descriptive statistics (e.g., percentage of responses) to find out the preference of the learners. Finally, several items (2, 3, 5, 7) were partially open-ended, requiring participants to provide yes or no answers along with explanations for their choices.

4. Results

The first research question sought to determine if there exists a distinction in how EFL students' listening comprehension is affected by the two input formats, specifically auditory and video-audio. To this end, students' scores in auditory and video-audio tests were compared using SPSS software version 21. Table 1 presents the statistical description of the participants' scores in multiple-choice listening comprehension tests.

Table 1

Descriptive Statistics for Auditory and Audiovisual Tests

Test	N	Mean	SD
Auditory test	51	10.74	3.40
Audiovisual test	51	12.45	2.92

Table 1 indicates that the auditory input had a lower mean among the 20 multiple-choice listening comprehension questions, compared to the audiovisual input. To verify this observation,

a paired samples t-test was conducted on the mean scores. A summary of the results of this analysis are presented in Table 2.

Table 2

Paired Samples t-test Comparing Listening Comprehension Tests in Auditory and Audiovisual Tests

Multiple-choice Test	Mean	df	t- value	Sig.(2-tailed)
Auditory vs. Audiovisual test	1.70	50	4.22	.000

p<.05

The results of this test showed a significant difference in the average scores (t=4.22, df=50, p=.000), indicating that students achieved considerably higher scores on the audiovisual test compared to the auditory test.

Our second research question investigates a condition in which EFL students display a higher level of performance as evidenced in their writing performance. To this end, the students were required to write a summary for the fourth listening text in the auditory and video-audio sessions. Then, their fluency and accuracy rates were calculated. Table 3 presents the descriptive statistics of these measurements.

Table 3

Descriptive Statistics for Writing Accuracy & Fluency in Auditory & Audiovisual Tests

	N	Mean	SD
Auditory Accuracy	51	88.64	8.07
Audiovisual Accuracy	51	89.09	13.45
Auditory Fluency	51	23.70	8.66
Audiovisual Fluency	51	22.11	7.75

Based on the students' summary writing for the fourth listening passage, the mean score for audiovisual accuracy is slightly higher than that for auditory accuracy but the difference is minimal (0.45 points). The difference in mean scores between auditory and audiovisual fluency is slightly noticeable. The mean scores indicate that participants performed better in writing accuracy compared to writing fluency, regardless of whether the condition was auditory or audiovisual. In the auditory test, students' accuracy and fluency means were slightly different in the two listening input conditions. To test the significance of these differences, two paired samples t-test analyses were run, the results of which are presented in Table 4.

Table 4

Comparing Accuracy & Fluency of Writing between Auditory &Audiovisual Tests

	Mean difference	df	t- value	Sig.(2-tailed)
Accuracy: Auditory vs. Audiovisual	0.45	50	0.21	0.83
Fluency: Auditory vs. Audiovisual	1.58	50	1.51	0.13

p<.05

The results of the paired samples t-tests indicated that there was not any statistically significant difference in the percentages of accuracy and fluency rates in students' summary writing between the auditory and video-audio listening tests.

The third question addressed the factors contributing to better comprehension in either audio or video listening tests, as reported by participants in the post-test questionnaires. The participants' responses to the questionnaire consisting of 10 items are summarized below.

Item 1*.In general, how would you describe the level of difficulty in the listening test?*

Analyzing the complexity of the listening test, four students found it exceedingly simple, while 12 students (24%) regarded it as easy. Thirty-three students (65%) considered it of moderate difficulty, and only two students (4%) perceived it as challenging. Overall, the majority of students view the test's difficulty as normal.

Item 2*. Did you encounter difficulties comprehending what the speakers were saying?*

Among the students surveyed, 35 students (68%) reported difficulties in understanding the speakers, while 16 students (32%) had no issues. Of those facing comprehension challenges, six cited the rapid speech rate, four mentioned the speakers' accents, three had trouble hearing the speakers, and another three struggled with concentrating on the content.

Item 3. *Were there any details from the lectures that you found to be familiar to you?*

Regarding the familiarity of the information in listening texts, 37 students (72%) found the information unfamiliar, 14 students (27%) recognized some of it. Of those who found parts familiar, eight had already heard *Stonehenge* (second listening text), four knew about cycling rules (fourth listening text), and two were familiar with success rules for running a café (first listening text).

Item 4. *Did you take any notes during the listening session?*

Regarding note-taking while listening, out of 51 participants, nine never took notes, nine rarely take notes, 15 sometimes took notes, 11 took notes most of the time, and seven always took notes.

Item 5. *If you took any notes, did they assist you in responding to the questions following the listening session?*

In the fifth question, participants were asked about the usefulness of the notes. Forty-two students (82%) found the notes were useful, while nine students (18%) did not. Many comments indicated that students primarily took notes on details, keywords, and names for better retention. Others mentioned taking notes specifically for summarizing the fourth listening text or to help fill in blank.

Item 6*. How frequently did you look at the computer screen while listening?*

The sixth item asked participants about the frequency of looking at the screen. Fourteen participants mentioned that they look at the screen all the time, and 21 did so most of the time, eight sometimes, and eight rarely. No participant reported never looking at the screen.

Item 7*. Did the video contribute to an enhanced understanding of the speakers for you?*

In the next item, participants were asked about the usefulness of the video. Thirty-two students (63%) found the video useful, while nineteen (37%) did not. Opinions varied: some found visual aids helpful for understanding and remembering the details, while others focused mainly on the audio and found the video less useful. Some felt that video was both helpful and distracting, while others noted it provided no additional information beyond the audio. Several participants believed the video improved focus on them understand event relationship better, and enhanced engagement through body language was helpful as well. One participant mentioned that visual explanation attracted their attention. Overall, most participants had a positive attitude towards the video material.

Item 8. *Did the clarity of the audio and/or video impact your comprehension of the speakers?*

The subsequent item examined the quality of audio or video input. Nine students indicated that the quality of the content affected their listening comprehension and test performance. Specifically, five students reported that poor audio quality hindered their understanding, and three students mentioned that the speakers' accents made comprehension difficult.

Item 9*. Did you prefer the video version of the listening tests or the audio version?*

We investigated students' preferences between audio-only and video-audio formats and their reasons. Out of 51 participants, 38 students (75%) preferred the video format, citing reasons such as photographic memory, better concentration and engagement, increased interest and understandability and a greater willingness to continue. They also found auditory formats more stressful. Conversely, 13 students (24%) preferred auditory format, finding videos distracting and believing audio helped them concentrate better. Despite these differences, the majority favored the audiovisual format.

Item 10. *What posed the greatest challenge during the listening comprehension test?*

In the final item, participants shared their challenges during the listening tests. Nine participants found memorizing details to be the most difficult. Six participants struggled with maintaining concentration and avoiding distraction while six found fill-in-the-blank questions particularly challenging. Four students mentioned that unfamiliar vocabulary hindered their comprehension and four others found the speakers' accents problematic. Additional issues, each mentioned by one participant, included difficulties with the listening text on *Stonehenge*, taking notes while listening, the similarity of multiple-choice answers, the pace of listening tests, and managing reading questions on-screen while answering on a separate sheet.

5. Discussion

This research compared the linguistic performance of EFL students on auditory and audiovisual listening comprehension tests, using a test-retest design. It also assessed students' perspectives on these test formats through a questionnaire. The findings showed that students scored significantly higher on the audiovisual test compared to the auditory test. Statistical

analysis confirmed this significant difference, indicating that students performed better on listening comprehension tests when they were presented in a video-audio format.

By considering several principles from Mayer's (2014) cognitive theory of multimedia learning (CTML), we can see why video-audio input might offer significant benefits for listening comprehension in EFL students. CTML is based on the idea that humans process information through dual channels (visual and verbal) and that active learning requires coordinated cognitive processes. Video-audio input utilizes both channels simultaneously, allowing learners to process and integrate information more effectively. For EFL students, this means they can hear the language while also seeing relevant visual context, which helps reinforce understanding and retention. Additionally, each cognitive channel has a limited capacity for processing information at any one time. Video-audio input can distribute the cognitive load across both channels, reducing the risk of overload. For instance, seeing a person speaking (visual) while listening to their speech (auditory) can make it easier to follow along compared to processing dense information through audio alone.

The results of this study are consistent with prior research, indicating that students' listening comprehension improves when presented with audiovisual materials (Ginther, 2002; Gruba, 1997; Jones, 2003; Jones & Plass, 2002, Kamariah, 2018; Mueller, 1980; Progosh, 1996; Secules et al., 1992; Sulaiman et al., 2017; Woottipong, 2014). Specifically, Wottipong's (2014) study on the impact of video materials on teaching listening skills supports this findings, although it lacked a control group exposed solely to audio materials.

Additionally, Sulaiman et al. (2017) also reported similar findings suggesting higher listening comprehension scores with video-audio tests. However, it is noted that Sulaiman et al.'s study, used interview format for all three listening texts and employed multiple-choice questions, contrasting with the present study's use of various text types (monologue, conversation, and lecture) and diverse test items (multiple-choice, fill in the blanks, short answer).

The findings of this study diverge from several previous studies that suggest students perform better in auditory test formats (Basal et al., 2015; Conaim, 2001; Lynch, 1998; Ockey, 2007; Souvorov, 2008). For example, Suvorov (2008) found superior performance in audio-only group in comparison to the video-audio group, which contrasts with the outcomes of our study. This difference could be attributed to individual differences and learner preferences, as Souvorov noted that students generally preferred auditory material. Another potential explanation for the better scores observed in the video-audio test in our study might be due to the methodological differences. Our study utilized a test-retest design, where students listened to the video format of the same audio file, possibly enhancing comprehension. In contrast, Suvorov's study used different audio and video files.

Similarly, Basal et al. (2015) reported contrasting results with students performing better in the audio group rather than the video group. Factors such as separate groupings for audio and video, the use of multiple-choice test items, and listening to each passage twice could account for

these differences compared to our study's methodology. In summary, while our study shows that students achieved higher scores in the audiovisual test format, these findings contrast with prior research outcomes, suggesting that variations in study design, materials used, and students' preferences may influence performance outcomes in listening comprehension tests.

The second research question investigated the condition in which EFL students might display a higher level of performance in their writing performance. While students' accuracy in summary writing was higher in audiovisual test, their fluency was slightly better in auditory tests. These findings suggest that different aspects of comprehension and performance (e.g., accuracy vs. fluency) might be influenced differently by the presence of visual cues. However, these differences were not statistically significant. Similar to the present study, Cubilo and Winke (2013) found no difference in students' essay writing performance. They used an analytic rubric for essay writing evaluation, showing no difference in performance based on the test format.

The findings of the present study are also in agreement with Conaim's (2001) study, suggesting no difference between performance in auditory and video-audio tests. Conaim (2001) used a question-answer format, and despite similar results to the current study, the different methods of assessment (comprehension through Q & A vs. summary writing) points to how varied assessment tools can lead to different insights about comprehension. Moreover, Conaim's study involved English language teachers, whereas the current study focused on EFL students. Different target populations might have varying levels of dependency on visual aids for comprehension, which can affect performance in audiovisual versus auditory tests.

The current study's results align with Rahmatian and Armiun's (2011) research, which similarly found that students performed better in the audiovisual group. Rahmatian and Armiun utilized separate audio and video groups, and evaluated understanding with short answer questions, differing from the test-retest design employed in the current study. Conversely, Suvorov's (2008) study, which used multiple-choice test items, showed superior performance in the audio-only group, contrasting with the findings of the current study. Design differences, such as Suvorov's use of multiple-choice tests versus the current study's summary writing can account for these discrepancies. This focus on summary writing introduces additional variables such as writing skill, which might not directly correlate with listening comprehension but is rather an integrative skill involving comprehension and productive abilities.

The third research question in this study focused on determining factors contributing to better comprehension in either audio or video listening tests based on participant questionnaires. The majority of students expressed a preference for the video-audio test format, finding it more beneficial and conducive to concentration with fewer distractions. This finding aligns with studies such as Woottipong (2014), where participants showed positive attitudes towards using videos in teaching listening skills. However, these results contrast with findings from studies like Souvorov (2008) and Conaim (2001). In Souvorov's (2008) study, the participants mostly preferred the audio version of the test, again highlighting how varying assessment formats can yield different

results. In summary, these differences underscore the multifaceted nature of listening comprehension and the impact of assessment formats. They highlight how various elements such as test format, participant background, assessment tools, and evaluation focus can lead to different interpretations and outcomes, demonstrating the complexity of accurately assessing listening comprehension in EFL contexts.

6. Conclusion

This study explored the efficacy of employing auditory and video-audio materials in enhancing students' listening comprehension. Despite conflicting findings in earlier research, the outcomes of the present study indicated that students performed better in the audiovisual listening test compared to the audio-only listening test. The study provides support for cognitive CTML by suggesting that the combination of auditory and visual stimuli helps distribute cognitive load, enhances active processing, and provides multiple representations of information, which are temporally and spatially contiguous. These factors together contribute to a more effective and engaging learning experience, potentially leading to better comprehension and retention of the language.

The study found no significant difference in students' fluency and accuracy in summary writing between audio-only and video-audio listening tests. Participants generally perceived that visual elements helped them stay more engaged, focused, and aided in better understanding and retention of audio content over time. It is important to note that student preferences and learning styles significantly influence the effectiveness of different presentation modes.

Based on these findings, there are practical implications for both EFL teachers and learners. Incorporating visual elements into language instruction can enrich classroom activities such as gap-filling exercises, group discussions, and even oral presentations. Visual materials also provide teachers with readily available resources, reducing preparation time. Aligning with the study's results, teachers should consider learners' preferences and perspectives when selecting teaching and testing materials, as these factors strongly impact learning outcome. Moreover, video materials are noted to be less monotonous for learners, allowing for extended engagement, which can enhance teaching and testing duration in language courses. Additionally, the motivational aspect of the visual content helps sustain learner interest throughout lessons and assessments, contributing positively to the learning environment.

This study had certain limitations that could be addressed in future research. The participants were sampled from the same cultural background and level of proficiency. This can restrict the ability to generalize findings to other settings or groups. Moreover, the current study had a limited number of participants selected through convenience sampling and did not include a control group. While convenience sampling is practical and cost-effective, it might present several limitations including lack of representativeness, selection bias and homogeneity of sample.

Selecting the participants who are readily available may not reflect the diversity of the larger population. Including a control group that does not receive any intervention or a different intervention could provide a more robust comparison to assess the effectiveness of auditory versus audiovisual input. Researchers should consider complementing convenience sampling with other methods, such as random or stratified sampling, and include a control group when feasible.

The present study utilized test-retest format, though it acknowledges that using parallel tests could mitigate the potential advantage of better scores due to test content recall. Despite these limitations, several recommendations for future research were suggested. Factors such as note-taking habits, topic familiarity and initial preferences for audio or video could have influenced the study outcomes and should be carefully considered in future studies comparing audio and audiovisual listening tests.

It would be beneficial for researchers to explore the effectiveness of video-audio materials in teaching and testing other language skills beyond listening comprehension. Given that some participants reported feeling more comfortable and believed it enhanced their understanding, future studies could explore the impact of providing test takers with instructions on stress patterns and gestures. This could help assess whether such guidance influences test performance and reduces anxiety levels. Moreover, expanding the current study to include an analysis of the content of the participants' notes could provide further insights into their listening comprehension processes.

Future research could explore familiarity with the topic of auditory or audiovisual input and their potential correlation with higher scores on an integrated writing task and listening comprehension. For instance, future studies could employ different conditions including taking handwritten notes while listening to an auditory lecture or watching an audiovisual presentation continuously throughout the lecture or presentation or at the designated time. The effect of familiarity with the topic of the lecture may also be examined by involving participants with low or high prior knowledge about the topic. By manipulating these factors, researchers can explore how different conditions influence the effect of auditory and audiovisual inputs on writing accuracy.

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