

Subtitles and Accessibility: Insights From China's Deaf Community

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Abstract

This article presents the results of an in-depth examination of the media consumption patterns and subtitle preferences among the deaf community in China. After a description of this community and the Chinese audiovisual landscape, the results of a questionnaire administered to 228 Chinese participants will be presented. The participants answered questions regarding their video-viewing habits and their preferences for Subtitling for the Deaf and Hard of Hearing (SDH), including character identification, and information on sound, tone and music. A key finding for Chinese viewers is the demand for more programs to be subtitled as well as for verbatim subtitles. The study shows partial satisfaction with current media offerings. Aligning with broader digital trends, this group identified mobile devices as the primary medium for video consumption.

Key words: audiovisual translation, media accessibility, subtitling for the deaf and hard of hearing.

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Introduction

The consumption of audiovisual content continues to grow exponentially worldwide, with 65% of all internet traffic driven by video (Sandvine, 2023). Consequently, individuals with sensory loss face barriers to accessing the same information because most content is designed for those with typical sight and hearing, prompting the need for inclusive audiovisual translation practices. Scholars like Tucker (1997) highlight that the exclusion of deaf people from mainstream society is due to the lack of accessibility to audiovisual programs, whether on TV broadcasting or at cinemas, theatres, and museums. As a result, new forms of translation, such as subtitling for the deaf and hard of hearing (SDH) and audio description (AD) for the blind and partially sighted, have emerged to provide tailored access to audiences with specific needs. Netflix, for instance, made its AD and SDH services available in over 20 languages by 2022 (Netflix, 2022).

While the Chinese market produces standard subtitles for most TV programs and films, the specific needs of the deaf community are not taken into account. Notably, no SDH service is offered on free-to-air TV in China, and there are no established conventions or guidelines (Casas-Tost & Rovira-Esteva, 2018). This apparent deficit in accessibility serves not only as a challenge but also as an opportunity to drive rapid and transformative change in this domain in China.

By presenting national data and perspectives, this investigation sheds light on how audiences, within their socio-cultural context, perceive and engage with audiovisual products. This article begins with an outline of the methodology employed to gather data and insights pertinent to answering our research question (see Section 3). The subsequent sections present the results of the questionnaire. This is followed by a discussion of the findings. Finally, the paper will conclude with recommendations for improving audiovisual accessibility in China, based on the insights gleaned from this study.

1. Background

This section provides an overview of the context relevant to the present study, including the Deaf community and the broader audiovisual landscape in China.

1.1. The Deaf Community in China

China has the highest global prevalence of hearing loss, affecting 27.8 million individuals, according to the most recent 2006 Second National Sample Survey on Disability (The State Council Information Office of the People's Republic of China, 2006). Among them, those with profound and severe hearing loss¹ constitute 26.58% of the total population. Extrapolating from these figures, it is estimated that

¹ *The Chinese disability practical assessment criteria* categorizes hearing loss into four levels based on severity and average loss in the better ear: *Level One* (≥ 91 dB HL), profound; *Level Two* (81–90 dB HL),

approximately 7.39 million people in China experience complete hearing loss. According to the *Blue book of hearing health report* (China Hearing Medicine Development Foundation, 2021), the number increases by around 30,000 each year. As per the 2016 National Survey on Hearing Loss and Ear Diseases (People.com, 2016), only 27.56% of individuals with hearing loss had undergone ear examinations, and the usage of hearing aids or cochlear implants among those with moderate or severe hearing loss was only 7.91%.

What forms of access to audiovisual media currently exist for this audience?

1.2. Audiovisual Landscape in China

In the early stage of the Chinese cinema industry, subtitling emerged as the predominant method during the silent film era in the 1920s, presented in the form of intertitles. By 1933, most foreign films shown in China employed subtitles (Chen, 2016). However, with a literacy rate below 20% at the time, there were significant challenges in subtitles reaching a wider audience (Ma, 2005). To address this, dubbing gained popularity in the late 1940s and experienced a peak in the 1970s, with an annual production of approximately 35 dubbed films (Lei, 2018). The latter part of the 20th century witnessed a resurgence of interest in subtitling, attributed to advancements in multimedia, internet, and video editing technologies, along with China's opening-up policy and increased language proficiency among younger audiences (Deng, 2018). A 2002 online survey by Sina.com revealed that 70.37% of respondents preferred subtitled foreign films over dubbed counterparts. In addition to translated subtitling, intralingual subtitling is widely practiced in China, with most domestic audiovisual content subtitled in Standard Chinese to enhance the conveyed information (Wang, 2015). Li Dongxiao (2013) and her team discovered that ten major TV stations in China had a proportion of 56.57% of programs with subtitles and further noted (Li & Looms, 2015) that "people with hearing impairment are quite well served at the national level with open captions/subtitles with the exception of live content such as news." Although subtitles are widely used in China, there is a lack of official guidelines and empirical studies on subtitling, and the issue of accessibility remains largely unaddressed (Casas-Tost & Rovira-Esteva, 2018).

China has established laws and regulations mandating subtitles for government-run television programs and sign language news broadcasts. Despite the abundance of related documents, their ineffectiveness stems from their theoretical nature and lack of concrete guidance (Casas-Tost & Rovira-Esteva, 2018; Zhao, 2009). And all subtitles provided are standard subtitles, not aimed at deaf viewers, and therefore lack many of the crucial features required for SDH, such as speaker identification and sound labels. Live programs, including the most popular ones, do not typically offer real-time subtitles (Li & Looms, 2015). As for Chinese Sign Language interpretation, it is the only form

severe; *Level Three* (61–80 dB HL), moderate; and *Level Four* (41–60 dB HL), mild. Comparing this to the WHO standard, it has a higher starting threshold for each level—for example, mild hearing loss begins at 41 dB HL in the Chinese system compared to 26 dB HL in the WHO criteria.

of media accessibility service for deaf audiences. By 2018, 295 programs with sign language interpretation had been produced, constituting approximately 0.1% of broadcast content on TV (Li, 2013). However, a survey (Liu et al., 2013) revealed low recognition of the sign language used on TV among the deaf community due to challenges in standardising sign language across regional dialects. A subsequent viewing survey (Xiao et al., 2018) confirmed this, with 84.8% of the deaf audience reporting difficulty understanding more than half of the sign language used in these programs.

In conclusion, while intralingual and interlingual subtitles are widely available, they are not specifically designed for deaf viewers, and sign language interpretation remains limited. Therefore, it is crucial to examine the experiences of deaf viewers with existing resources and identify their specific needs to develop accurate guidelines and enhance accessibility services.

2. Reception Studies on SDH

The development of reception research in SDH is closely connected to the development of this kind of subtitling as a professional practice. Early studies on SDH conducted in the United States during the 1970s focused on the educational value of subtitling. These studies provided the first evidence supporting the use of captions over sign language interpreting (Davila, 1972; Norwood, 1976; Propp, 1972). The launch of closed captions on US TV in the 1980s led to the first large-scale research studies on user habits and preferences, which became the common combination of reception research on SDH (Blatt & Sulzer, 1981; Fitzgerald & Jensema, 1981). In the 1990s, research on SDH began to focus on various parameters, especially subtitling speed (Jensema et al., 1996; Meyer & Lee, 1995) and the use of colour and displacement for character identification in captions (King, 1994) and in non-speech information (Harkins et al., 1996). Technological advancements have enhanced the methodologies used in SDH research, with eye-tracking technology emerging as a key tool for analysing SDH reception. Early eye-tracking studies on SDH (e.g. Jensema et al., 2000; d'Ydewalle & Gielen, 1992) revealed that captions dominate eye movement, with viewers tending to focus on the centre of the screen, shift to captions as they appear, and then return to the images. In subsequent years, research on SDH has become increasingly specialised. Bisson et al. (2012) found that most participants read subtitles even when unnecessary or incomprehensible. Szarkowska et al. (2011) examined the effects of editing (edited vs. verbatim) and subtitling speed (2018), finding that deaf and hard-of-hearing viewers could effectively follow both edited and verbatim subtitles, even at faster presentation speeds. In Europe, the eye-tracking approach was incorporated into one of the most comprehensive reception studies to date, the EU-funded DTV4ALL project (Romero-Fresco, 2016). This project analysed reception in seven European countries, including the UK, Spain, Italy, Poland, Denmark, France, and Germany, and collected data on viewers' preferences, comprehension, and perception through questionnaires and eye-tracking experiments, offering a panoramic view of how SDH is processed and understood across various cultural and linguistic contexts. The current study adapts the questionnaire template from the DTV4ALL project to conduct a similar investigation in China, drawing on its methodologies to explore the specifics of media accessibility within the Chinese context.

Reception research has since shifted its focus to viewers' sense of immersion and the impact of display devices on the SDH experience. Romero-Fresco and Fryer (2016) analysed SDH reception (preferences, eye movements, and presence) on LED screens and tablets among 157 viewers. Their findings challenge the belief that subtitles reduce immersion, providing the first statistical evidence that SDH allows viewers with hearing loss to engage in the fictional world as much as hearing viewers without captions.

To the best of our knowledge, no nationwide studies on the reception of audiovisual content among individuals with hearing loss have been conducted in China to date. In 2011, Li Dongxiao (2013) conducted a study in Zhejiang Province that focused on both visual and auditory loss. The study included a questionnaire and evaluated the provision of subtitles on the top ten television stations in China during the first half of 2011. Li's findings revealed that individuals with sensory loss mostly favoured news programs, dramas, and variety shows. Nearly 60% of respondents expressed a strong need for sign language in television broadcasts. Additionally, there was widespread consensus on the necessity of subtitles, particularly for news content. Television remained the most popular medium for participants.

To understand the current accessibility situation in China, the study reported in this article specifically investigates the subtitle needs and preferences of the deaf community, aiming to answer the following research question: (1) What are the media consumption habits of deaf people in China?; (2) How do audiences with hearing loss in China perceive existing subtitles?; (3) What are their preferences for SDH features?

As part of a larger project that intends to draw up accessibility guidelines for SDH in China, we devised a structured questionnaire, targeting the deaf population to gauge their media consumption habits, preferences, and feedback on subtitling as a first step. By analysing the questionnaire results, we assessed current AVT product satisfaction and determined how well these needs are met. As a follow-up to this questionnaire, we will examine best practices in subtitling by eye-tracking a group of approximately 60 participants to obtain detailed user feedback. The overall study will then provide insights for future research, policymaking, and the development of SDH guidelines in China.

3. Methodology

This section outlines the questionnaire, its distribution, and the demographic details of the participants.

3.1. The Questionnaire

The research instrument in this study is a structured questionnaire comprising 43 questions. This tool is chosen for its efficiency in collecting extensive quantitative and qualitative data from a diverse participant group. The questionnaire is adapted from the European DTV4ALL project template

(Romero-Fresco, 2016) to fit the Chinese context, including considerations for the common languages used by this group, and the current unavailability of SDH services in China. Administered through Qualtrics,² the questionnaire requires approximately ten minutes to complete. It underwent three rounds of internal review by the research team in English. It was then translated into Chinese by one of the researchers and reviewed by three Chinese individuals with hearing loss. Their feedback led to simplifications in the language to enhance readability. For instance, the use of technical jargon such as “media accessibility” was avoided.

The questionnaire was organised into four sections. The first section was entitled Personal Details and included twelve closed-ended demographic questions to collect information on age, gender, education, occupation, residence, the level and onset age of hearing loss, and their preferred language of communication. While most questions in this section were closed-ended, requiring participants to select from given options (e.g., “What is your level of hearing loss?”), some were open-ended to allow participants to provide their own responses where pre-set choices may be inadequate (e.g., “What is your job status?”). Section two, entitled General Information and Preferences, included ten closed-ended questions addressing topics such as daily consumption of audiovisual products, frequency of subtitle use, preferred viewing methods, and types of content consumed. Section three, Subtitling, included three closed-ended questions about the viewing experience with existing subtitles, such as “How do you find the speed of the standard subtitles?”. Section four, SDH Preferences, consisted of fifteen closed-ended questions relating to the technical and aesthetic aspects of SDH, including subtitle placement, the presentation of sound information, and the identification of characters. Participants were presented with various SDH strategies and asked to indicate their preferred solutions. This approach aimed to evaluate different potential strategies, identify audience preferences, and contribute to the development of SDH guidelines. In the DTV4ALL template, these questions were followed by others focused on how respondents used the subtitles provided on TV and whether SDH availability affected their program choices. These questions were eliminated from this questionnaire because Chinese public television does not offer SDH. The section concluded with a set of closed-ended questions for participants to rate their overall satisfaction with the media accessibility services they have received in China, and an open-ended question inviting additional comments and feedback to enhance the study’s qualitative insights.

The original questionnaire in English and Chinese is available [here](#).

² Qualtrics is a popular online survey platform used for conducting surveys and collecting feedback. <https://www.qualtrics.com/>

3.2. Dissemination

The participants in this study are Chinese individuals who identify as deaf or hard of hearing. Through two major social media platforms in China, RED³ and Douyin⁴, connections were established with the deaf community. This led to access to two WeChat chat groups, each with around 200 members, where the questionnaire was distributed.

After collecting 203 responses via a Qualtrics link from 28 November to 19 December 2023, it was observed that participants aged 40 and above were notably absent. This was likely due to the recruitment method, as the study was primarily advertised through online chat groups frequented by younger individuals, thereby reducing its reach among older age groups. To address this issue, one of the researchers used an offline approach by distributing paper questionnaires in Qujing City, Yunnan Province, facilitating data collection. The main researcher visited the Xianfeng Welfare Factory and, through coordination with the factory manager, identified eligible participants among both working and retired employees, and those with age-related hearing loss. In total, 25 paper surveys were collected through the offline method.

3.3. Participants

A total of 228 participants were included in the study: 118 females and 103 males. Their mean age was 33.4 ($SD = 12.53$), ranging from 16 to 77 years old. Regionally, 23% resided in tier 1 cities⁵, such as Beijing and Shanghai, 26% in tier 2 cities, such as Tianjin and Nanjing, and the remainder in smaller cities, towns, or rural areas. Educational attainment was high, with 144 participants holding degrees from colleges or universities, and 140 participants were employed across a diverse range of sectors, including IT, services, and public service, reflecting a varied occupational spread within the sample. Communication preferences predominantly favoured spoken Chinese, used exclusively by 71.9% of the participants, with bilingual modes (spoken Chinese and Chinese sign language) employed by about 19%, and exclusive sign language usage by 4.8%. Profound hearing loss was the most common condition, affecting 65.4% of the study's participants.

³ RED (Xiaohongshu) is a popular Chinese social media and e-commerce platform where users share lifestyle content, including fashion, beauty, travel, and shopping experiences.

⁴ Douyin, the Chinese counterpart of TikTok, is a short-video platform that enables users to create, share, and explore a wide variety of entertaining and creative content.

⁵ In China, cities are classified into three tiers based on their economic development and size. First-tier cities like Beijing and Shanghai are the largest and most advanced, serving as economic and cultural hubs. Second-tier cities, including Chengdu and Hangzhou, are economically developed but smaller in scale. Third-tier cities, such as Xi'an and Fuzhou, are smaller.

4. Results and Discussion

This section presents a comprehensive analysis and report of the survey data, focusing on participants' media consumption habits, subtitle usage, and preferred SDH features.

4.1. Consumption Habits

This section of the questionnaire assessed participants' viewing habits, including content types and daily viewing hours, providing insights into general trends within this sample in China. These insights help identify priority productions for SDH implementation, given its current limited availability.

Notable correlations between variables (e.g. hearing condition, age, and educational background) and the preferences are explored and illustrated through cross-tabulation to examine socio-cultural factors that might affect their preferences.

Individuals with different degrees of hearing loss show varying levels of reliance on subtitles (Table 1). Notably, the profound hearing loss group demonstrates the highest dependency, with approximately 51.7% (77 out of 149) requiring subtitles at all times, and none of them reporting no reliance at all. In comparison, the severe hearing loss group has a lower yet significant reliance, with around 48.8% (20 out of 41) always using subtitles, while participants with moderate or mild hearing loss exhibit substantially lower rates of subtitle dependence. Overall, the data underscores the critical role of subtitles in media accessibility, with 48.2% of the total sample needing them at all times. For those who do not always rely on subtitles, factors such as residual hearing, hearing aid use, volume adjustments, content clarity, and ease of lipreading may all influence their reliance on subtitles.

Table 1

The Need for Subtitles by the Level of Hearing Loss

Degree of Hearing Loss	1–24% of the time	25–49% of the time	50–74% of the time	75–99% of the time	Always (100%)	Sum
Profound	3	8	30	25	77	149 (65.4%)
Severe	0	4	4	11	20	41 (18.0%)
Moderate	0	2	6	8	11	27 (11.8%)
Mild	1	2	1	1	0	6 (2.6%)
Other	0	0	1	2	2	5 (2.2%)
Sum	4 (1.8%)	15 (6.6%)	6 (2.6%)	47 (20.6%)	110 (48.2%)	228 (100.0%)

Overall, over 50% of participants reported being moderately or extremely satisfied with subtitles on mainstream video platforms. However, when broken down by degree of hearing loss, satisfaction levels differ notably. Participants with profound or severe hearing loss typically reported neutral to moderate satisfaction, a pattern also reflected among those with moderate and mild hearing loss, despite smaller sample sizes. These variations underscore the importance of directly consulting user groups when developing accessible subtitles.

Table 2*Satisfaction With Current Subtitles by the Level of Hearing Loss*

Degree of Hearing Loss	Extremely dissatisfied	Somewhat dissatisfied	Neutral	Moderately satisfied	Extremely satisfied	Sum
Profound	4	3	60	62	20	149 (65.4%)
Severe	1	2	14	20	4	41 (18.0%)
Moderate	1	1	17	6	2	27 (11.8%)
Mild	1	0	1	3	1	6 (2.6%)
Other	0	0	1	2	2	5 (2.2%)
Sum	7 (3.1%)	6 (2.6%)	93 (40.8%)	93 (40.8%)	29 (12.7%)	228 (100%)

Table 3 reflects the distribution of foreign and domestic content consumption by different age groups. There is a clear preference for domestic content across all age groups, with every age bracket showing a minimal inclination towards foreign content (3.9%). Watching a balanced mix of both is notably more prevalent among the younger participants, who also show the strongest interest in foreign content. Exclusive consumption of foreign content is rare and was selected by only one participant.

Table 3*Viewing Ratio and Age Distribution of Domestic vs. Foreign Language Content*

Age	Mostly foreign content	Mostly domestic content	Roughly equal	Only foreign content	Only domestic content	Sum
16–25	7	44	11	0	9	71 (31.1%)
26–35	2	52	8	0	21	83 (36.4%)
36–45	0	27	3	0	6	36 (15.8%)

Age	Mostly foreign content	Mostly domestic content	Roughly equal	Only foreign content	Only domestic content	Sum
46–55	0	9	1	0	11	21 (9.2%)
56 or above	0	9	0	1	7	17 (7.5%)
Sum	9 (3.9%)	141 (61.8%)	23 (10.1%)	1 (0.4%)	54 (23.7%)	228 (100.0%)

Table 4 illustrates the preferred modes of accessibility for video content among participants with varying natural language backgrounds. Subtitles are the dominant choice, preferred by 69.7% of participants, particularly among those who use only spoken Chinese. Sign interpreting is chosen by 7.9% of respondents, with the highest preference among exclusive sign language users (4.8%). Furthermore, 21.9% of participants use assistive devices, such as hearing aids and speech-to-text applications.

Table 4

Preferred Mode of Accessibility by Participants' Natural Languages

Preferred Language	Sign Interpreting	Assistive device	Subtitles	Other	Sum
Spoken Chinese and sign language	5	20	18	0	43 (18.9%)
Spoken Chinese only	4	24	135	1	164 (71.9%)
Sign language only	9	2	0	0	11 (4.8%)
Written Chinese	0	2	4	0	6 (2.6%)
Other	0	2	2	0	4 (1.8%)
Sum	18 (7.9%)	50 (21.9%)	159 (69.7%)	1 (0.4%)	228 (100.0%)

Table 5 shows the preferred devices for watching video content across age groups. Mobile phones are the most preferred device, accounting for 65.4% of all responses. Mobile phone usage is consistently high across all age groups. Watching on TV and using desktop computers have roughly equal proportions of 13.6% and 14.5% respectively. Tablets and movie theatres/ cinemas are the least preferred devices.

Table 5*Preferred Devices of Watching by Age*

Age	Theatres	On TV	On mobile phones	Desktop computer	On tablets	Other	Sum
16–25	3	4	51	9	2	2	71 (31.1%)
26–35	0	9	62	8	4	0	83 (36.4%)
36–45	0	5	27	2	1	1	36 (15.8%)
46–55	1	1	5	13	0	1	21 (9.2%)
56 or above	0	1	4	1	0	0	17 (7.5%)
Sum	4 (1.8%)	31(13.6%)	149 (65.4%)	33 (14.5%)	7(3.1%)	4 (1.8%)	228 (100.0%)

Table 6 shows the result of the question “How much time do you spend watching videos every day?”, 32.9% of the participants watch videos for 1 to 2 hours daily, followed by those who watch for 2 to 4 hours (25.0%). A smaller percentage (19.3%) watches for less than an hour, and even fewer for 4 to 8+ hours.

Table 6*Daily Viewing Time*

Viewing Duration(hour)	Count	Percentage
≥ 1	44	19.3%
1 -2	75	32.9%
2 -4	57	25.0%
4 -6	26	11.4%
6 -8	12	5.3%
8+	14	6.1%

Table 7 displays the results of a multiple-choice question on the most frequently watched video types among participants. Online short videos are the most popular, at 25.7%, followed by movies and TV shows, each at around 20%. This highlights the preference for entertainment content. News, educational content, and cartoons/animations collectively make up a smaller portion of media consumption, accounting for 26.9% of total media consumption.

Table 7

Most Viewed Genres

Content Type	Count	Percentage
Movies	125	18.8%
TV series	139	20.9%
Online short videos	171	25.7%
News	84	12.6%
Cartoons or Anime & Manga	44	6.6%
Educational content	51	7.7%
Music videos and concerts	48	7.2%
Other	3	0.5%

4.2. Subtitle Experience

This section examines current subtitle-viewing experiences and preferences among participants, including standard subtitles, live subtitles, and SDH.

When choosing between verbatim (word-for-word) and sensatim (meaning-for-meaning) subtitles, Table 8 shows that 76.75% of participants preferred verbatim subtitles, whilst 23.25% chose sensatim subtitles. Respondents who opted for verbatim were also asked to justify their choice. The following main reasons were mentioned most frequently: “I want to know exactly what is going on”, “I want to know exactly what they are saying, just as hearing people do”, and “Complete subtitles can help improve lip-reading skills.” Participants preferred verbatim to avoid potential misinterpretations and ambiguity resulting from incomplete subtitles, despite the faster reading speeds and information overload that accompanied them. This preference, noted by 102 respondents, prioritises complete information access over potential challenges related to comprehension and cognitive load.

Table 8

Sensatim vs. Verbatim

Subtitle Type	Count	Percentage
Verbatim	175	76.8%
Sensatim	53	23.2%

Table 9 illustrates participant responses to the question of prior exposure to videos with SDH. The data reveal that 33.8% of participants had watched videos with SDH, 19.3% were unsure if they had, and 46.9% had not. A follow-up question targeted the 77 participants who confirmed watching videos with SDH to determine their perceptions of its helpfulness. Although participants expressed general satisfaction with standard subtitles in previous responses, they unanimously acknowledged the advantages of SDH in improving the viewing experience.

Table 9

Exposure to SDH

Response	Count	Percentage
Yes	77	33.8%
No	107	46.9%
I am not sure	44	19.3%

The National Radio and Television Administration⁶ has not explicitly specified industry standards for the presentation speed of Chinese standard subtitles. However, the prevailing practice typically adheres to a norm of no more than 14 characters (including symbols) per screen (14 cps), displayed for 3–5 seconds. Table 10 indicates that 69.3% of respondents find the speed on television appropriate, with only 11.8% considering it too fast, suggesting broad acceptance of the current subtitle speed. According to responses to another question assessing the difficulty participants experience when reading standard subtitles, 52% of respondents find them easy or very easy, while 38% experience moderate difficulty. Despite some research suggesting individuals with hearing loss generally have lower reading skills and slower reading speed (Guo, 2022; Jalalipour et al., 2016), the results indicate that they do not perceive subtitles as difficult to read. This may be due to familiarity with subtitles, contextual cues, and adaptive reading strategies. Further insights into subtitle readability and comprehension will be explored in subsequent eye-tracking and engagement studies as part of the larger research project.

⁶ The National Radio and Television Administration (NRTA) is a ministry-level executive agency controlled by the Central Propaganda Department of the Chinese Communist Party (CCP). Its main task is the administration and supervision of state-owned enterprises engaged in the television and radio industries.

Table 10*Satisfaction with the Speed of Standard Subtitles*

Response	Count	Percentage
Too fast	27	11.8%
Too slow	9	3.9%
About right	158	69.3%
I do not know	34	14.9%

4.3. SDH Preferences

In this section, questions covered key features of SDH, such as speaker identification and sound description. The frequencies of the participants' preferences for displaying audio cues in subtitles are displayed in Table 11.

For speaker identification, 55% of participants preferred speaker-dependent placement, highlighting a desire to minimise visual shifts. Meanwhile, 18.4% favoured name tags at the start of a dialogue, and 15% preferred colour-coding for its intuitive distinction between speakers. Combining placement and colour was the least popular choice at 10.5%. This lower preference may reflect perceived complexity or concerns about visual clutter.

Moving on to the issue of how sounds should be represented in subtitles, 41% of respondents prefer indicating the sound source (e.g. footsteps approaching from upstairs), as it helps to contextualise the scene and clarify characters' reactions. Meanwhile, 32% favour descriptions of what the sound is like (e.g. Piercing shriek), allowing viewers to imagine or feel the sound through sensory and contextual cues. Fewer participants (13.16%) prefer onomatopoeia (e.g., Bang or Woof) or visual cues, such as an animated telephone for ringing (12.28%). This preference suggests that audiences value clarity and context in sound representation, prioritising descriptions that enhance their understanding of the scene and characters' reactions over more abstract or creative elements, such as onomatopoeia or visual symbols. In another question exploring preferences for the placement of sound-related information, over half of the participants favoured subtitles with sound information at the bottom of the screen, while about 28% preferred placing the information next to the sound source. Typically, all types of subtitles in China are positioned at the bottom of the screen, with occasional relocations to the top to avoid covering critical image elements or complementary information in the original media.

Regarding the description of characters' moods (e.g., cheerfully) in subtitles, there is a split in preferences, with each option selected by roughly 30% of respondents. The top choice, however, was

“no need to describe,” implying that viewers might find emotional cues discernible enough from the context and body language of characters.

When addressing music in subtitles, it is essential to distinguish between background music, which typically carries less semantic significance, and foreground music (i.e., music or songs that are relevant to the storyline and acknowledged by the characters), which often carries substantial narrative or emotional meaning. Opinions diverge on how to capture the former: 40.8% of participants favour detailed information about the music, as this level of detail might help them better understand the scene. In comparison, 19.3% believe that including such details is unnecessary. Regarding foreground music, Table 11 demonstrates varied respondent preferences. Nearly 40% prefer subtitles that include all the information, including the song’s title, lyrics, and genre. When restricted to a single option, 31% prioritise displaying lyrics, suggesting their importance in offering insights into characters’ emotions and thoughts.

Table 11

Preference for Key Features of SDH

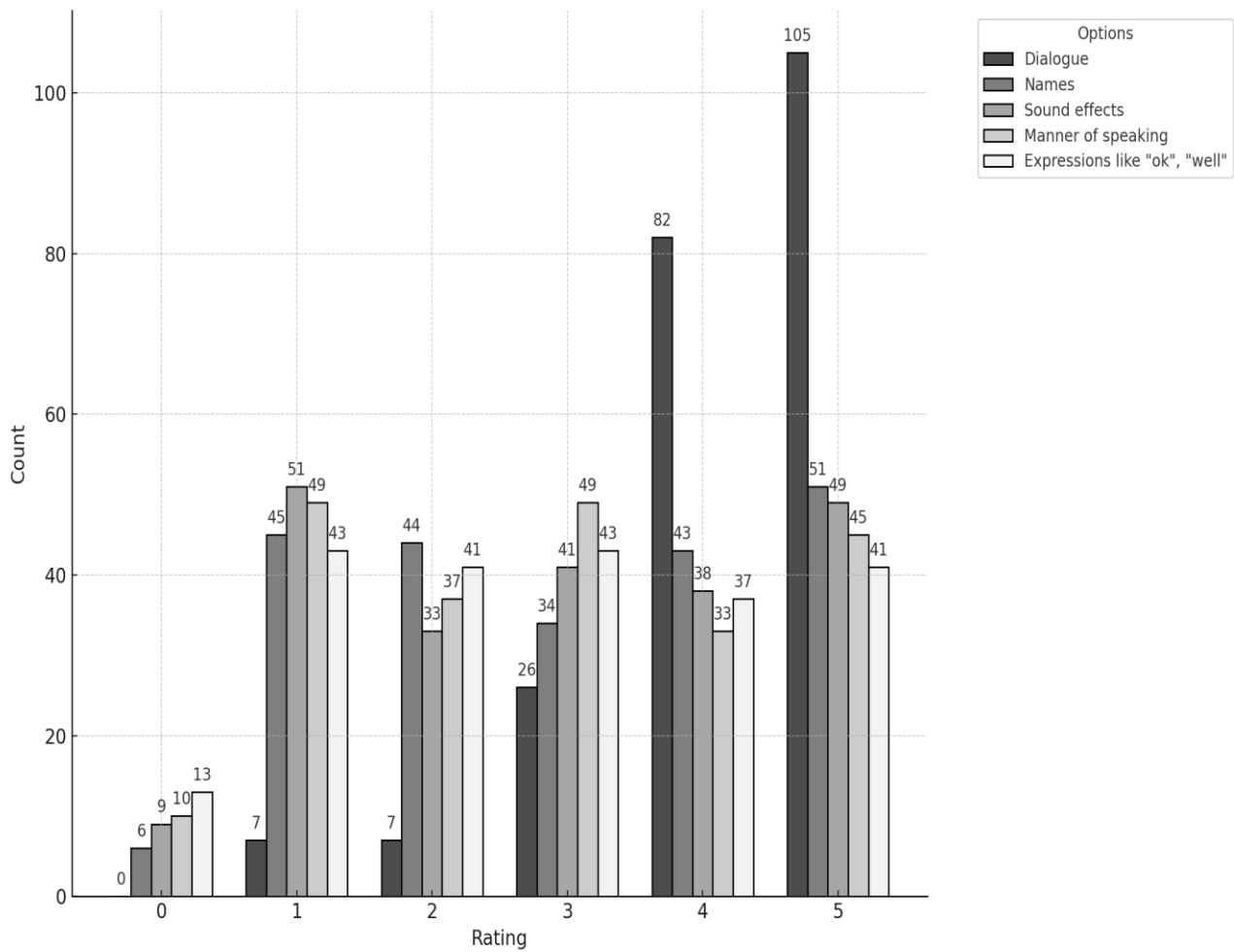
Category	Option	Count	Percentage
Speaker Identification	Positioning	125	55.3%
	Colours	35	15.8%
	Name tags	41	18.4%
	Combining colours and positioning	24	10.5%
Describing Sound Information	Explaining the source of the sound	94	41.7%
	Describing the sound	74	32.9%
	Onomatopoeia	30	13.2%
	Pictures	28	12.3%
Describing the Mood of Characters	Text description	78	34.2%
	Visual cues	67	29.8%
	Nothing	80	35.5%
	Other	1	0.4%
Presenting Background Music	A symbol indicating “music”	31	13.6%
	Music type	16	7.0%

Category	Option	Count	Percentage
	Title of the song	43	19.3%
	Nothing	43	19.3%
	All of the above	92	40.8%
	Displaying lyrics	71	29.8%
	Music type	19	8.0%
Presenting Meaningful Songs	A symbol indicating “music”	13	5.5%
	Title of the song	29	12.2%
	Nothing	17	7.1%
	All of the above	89	37.4%

Figure 1 outlines survey responses on the most essential content for subtitles when not everything can be included, with ratings overwhelmingly prioritising dialogue as the most critical element to include in subtitles, followed by speaker identifiers and sound effects. Manner of speaking is of moderate importance, and expressions like “ok” and “well” are considered the least necessary. This prioritisation reflects the viewers’ need for clarity and understanding of the primary content and characters over supplementary information. The preference for verbatim over sensatim subtitles aligns with this emphasis on comprehensive access to information, particularly through the inclusion of the full spoken dialogue.

Figure 1

Importance Ratings for Subtitle Elements



Note. 1 = Not important at all, 5 = Extremely important.

4.4. General Feedback

This section includes a closed-ended question assessing participants’ ratings of the current media accessibility services provided to them, along with an open-ended question soliciting suggestions and opinions on potential improvements in this area.

Table 13 shows participants’ satisfaction levels with the media accessibility services currently provided to them. The majority (53.9%) are neutral, feeling neither satisfied nor dissatisfied, while smaller proportions express varying degrees of satisfaction and dissatisfaction.

Table 13

Satisfaction With Media Accessibility Service

Satisfaction Level	Count	Percentage
Extremely dissatisfied	8	3.5%
Somewhat dissatisfied	39	17.1%
Neutral	123	53.9%
Moderately satisfied	38	16.7%
Extremely satisfied	20	8.8%

In the open-ended question, i.e., “Is there anything that should be changed about the media accessibility services for the deaf and hard of hearing?”, the majority of respondents indicated “None,” while some provided unrelated feedback. Among the valid responses as summarised in Table 14, those which offered suggestions can be categorised into two main groups: wishes and complaints. Wishes included a demand for more widespread availability of subtitles for all programs, especially live programs, with additional mentions of the need for improved features such as audio descriptions. Complaints predominantly focused on the inadequacies and inaccuracies of auto-generated subtitles on video platforms and speech-to-text applications.

Table 14

Feedback Frequency on Media Accessibility Services

Category	Number of Mentions
Increasing subtitle availability	14
Real-time subtitles for live programs	16
Enhancing accuracy and reach of auto-generated subtitles	15
Adding SDH Features	8

4.5. Discussion

The study surveyed 228 participants, predominantly from urban areas, to examine the media consumption and viewing experience of China’s deaf community. The average participant age was 33, with 67.5% aged 16 to 35. Gender distribution was balanced, and over half held higher education degrees. Of the respondents (60.6% profound, 16.9% severe, and the remainder moderate/mild), 61.4% were employed across varied occupations, suggesting broad educational access and regular

interaction with hearing environments among people with hearing loss. Profound hearing loss was common among them, typically manifesting early in childhood (ages 0–4).

Regarding consumption habits, the questionnaire revealed a preference for smartphones over televisions, which were the primary medium as noted in Li's study (2013), indicating a shift towards mobile, personalised media use over the past decade. Participants frequently watch online short videos, with many spending 1–2 hours daily. This is slightly lower than the statistical average for the broader Chinese population, which in 2023 was 168 minutes a day (Report on the Development of China's Audiovisual New Media, 2023). While the survey results highlight that online videos are most popular, series and movies are also highly preferred. The study also reveals a dominant inclination towards Chinese-language content among participants, with younger individuals displaying a slightly higher tendency to consume a mix of both Chinese and foreign content.

Regarding the mode of media accessibility for deaf audiences, this study identifies subtitles as the primary choice, showing a significant decline in the demand for sign language interpretation from 60% to 8%, compared to Li's study (2013). This shift can be attributed to the growing ubiquity of subtitles, which have emerged as the preferred mode of audiovisual translation in the Chinese context. Additionally, the Chinese government has integrated more deaf children into regular schools, with many starting in special schools and later transitioning to mainstream education (Report on Special Education Construction, 2013), which has narrowed the language proficiency gap between deaf and hearing individuals (Tang et al., 2023).

Regarding the viewing experience of existing subtitles, the study indicates neutral or moderately positive responses. This could be attributed to their lack of exposure to more advanced accessibility options, limited awareness of potential improvements, and habitual reliance on the current standard offerings. In terms of current media accessibility services for deaf viewers, over half of the participants are neutral, with 20% satisfied and 20% dissatisfied. The relatively low number of satisfied respondents can be partially explained by responses to the final open-ended question. Many participants noted the insufficient availability of standard subtitles, the low accuracy of auto-generated subtitles on video platforms or by applications, and the absence of real-time subtitles for live programs.

When examining their preferences for sensatim or verbatim subtitles, the study found a strong preference for verbatim over sensatim subtitles. This preference underscores the community's desire for access to the same comprehensive information as the hearing audience. This finding aligns with similar surveys conducted in other countries (Berke et al., 2020; Hersh, 2013; Radovanović et al., 2021). Verbatim subtitles are also preferred by deaf associations (Romero-Fresco, 2009). Moreover, eye-tracking studies have also shown that text editing does not enhance comprehension for intralingual subtitles, with verbatim subtitles leading to better understanding (Szarkowska et al., 2011, 2016).

Regarding SDH conventions, the questionnaire revealed that 30% of participants had prior experience with SDH subtitles and that all acknowledged their positive impact on their viewing experience. Participants were asked to indicate their preferred methods for presenting audio cues in SDH. However, due to the near absence of SDH in China and the lack of video or image examples in the questionnaire, these options reflect only participants' intuition or imagination and indicate only preliminary preferences. According to the survey results, the most selected alternatives are as follows:

Table 15*Preferred Features of SDH*

Feature	Preferred Option	Percentages
Subtitle Type	Verbatim, word-for-word	77%
Speaker Identification	Speaker dependent placement	55%
Sound Description	Indication of the sound source	41%
Sound Information Placement	At the bottom of the screen	55%
Mood of Character	No need to describe	30%
Background Music	Comprehensive info (title, music type, symbol)	40%
Meaningful Songs	Comprehensive info (title, lyrics genre)	40%

This study follows the DTV4ALL methodology (Romero-Fresco, 2016), allowing comparisons between China and Europe, and between contexts with and without established SDH services. In Europe, SDH has long been standard on TV and DVDs, shaping participants' preferences through prior exposure. Verbatim subtitles were preferred in six of the seven European countries, aligning with this study's findings. Speaker identification methods varied: Europe commonly used colour-coding, the U.S. favoured name tags, while Chinese participants preferred speaker-dependent placement. Sound source indication was the most favoured method for descriptions across all regions. Dialogue and sound information were favoured at the bottom of the screen across all regions. While European participants preferred presenting music through titles, types, or lyrics, Chinese participants favoured a more comprehensive representation of all elements. Emotion descriptions showed varied preferences in both studies, displaying emotions in brackets before dialogue was selected by three European countries. The comparison suggests that certain SDH preferences are universal and could inform future SDH guidelines in China.

5. Conclusions

By gathering and analysing detailed questionnaire data, the research has shed light on the media consumption habits and accessibility needs of the deaf audience in China, filling a notable gap in the existing literature and setting a precedent for future academic inquiry in this domain.

The deaf community enjoys a diverse range of media, with the highest viewership in online short videos, TV dramas, and movies. On average, individuals spend about two hours daily watching content, primarily in Chinese, and rely heavily on subtitles rather than sign interpreting. Participants indicated that the current subtitle speed is appropriate. One-third of participants reported prior exposure to SDH. Regarding preferences for SDH production, results indicate that deaf viewers desire subtitles that are comprehensive and include as much information as possible, while also being influenced to some extent by existing subtitle conventions. The research also highlighted the community's reliance on smartphones for media consumption. Feedback from participant revealed their need for more extensive subtitling, especially in live programs.

These findings address the three research questions regarding media consumption habits, perceptions of current subtitles, and preferences for SDH features among deaf viewers in China. Building on these findings, several actionable recommendations emerge to optimise media accessibility services in China: future subtitle production should place certain emphasis on mobile-friendly design; allocate SDH resources primarily to films and series; advance automatic subtitle generation for short video platforms; and expand the availability of real-time captions for live programs. To produce SDH, it is suggested to maintain the current subtitle speed without simplifying dialogue; use placement to differentiate speakers; indicate the source of plot-relevant sounds; provide comprehensive descriptions of music and songs; and position subtitle information at the bottom of the screen whenever feasible.

This study has several limitations. Data collected through self-reported questionnaires may be biased due to respondents' tendencies to give socially desirable answers or inaccurately assess their own behaviours and feelings. Additionally, the underrepresentation of older participants, ethnic minorities and those with mild or moderate hearing loss may affect generalizability.

Despite these limitations, the study provides valuable insights into the media consumption habits and accessibility needs of the deaf community in China, laying a foundation for future research and policy development. Future research is suggested to include a more diverse sample, utilise a mixed-method approach combining qualitative and quantitative data, and incorporate real-time SDH examples to better capture audience preferences and experiences. These directions will be addressed in the subsequent phases of the broader research project, which includes eye-tracking experiments and reception studies aimed at evaluating the impact of subtitle types and presentation styles on comprehension and engagement among deaf and hard-of-hearing viewers.

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