Canadian Association of the Deaf

Association des Sourds du Canada

Key Findings

Understanding User Responses to Live Closed Captioning in Canada

Acknowledgements

We would like to thank all of the respondents to this survey who gave their time willingly to help improve the quality of live captioning in Canada. Our special thanks go to the Broadcasting Accessibility Fund, who providing funding for this important research. Our thanks also go to Members of the Steering Committee - Jim Hardman, Bev Milligan, Cindy Gordon, Jessica Miller, Mike Menard, David Keeble, and Melina Nathanail - who devoted significant amounts of time to this project, allocated resources to completing certain tasks, and provided essential and tireless guidance and input to the project over a two-year timeframe. We also extend our thanks to: Bell Media, Corus Entertainment, CBC and Canadian Hearing Society, for providing venues and refreshments for our meetings; to Bell Media and Corus Entertainment for arranging video segments; to National Captioning Canada and RedBee Media for captioning; to the interpreters that provided interpretation services at our meetings, and for preparing the ASL recruitment video and questionnaire; to the Leger team, who worked painstakingly through iteration after iteration of analysis and presentations; to our team of international experts and advisors, Deb Fels, Pablo Romero-Fresco and Pilar Orero; to Christie Christelis, who managed the project; and to all other stakeholders who contributed to the success of the project.

Jim Roots, Project Leader
Executive Director, Canadian Association of the Deaf – Association des Sourds du Canada

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Executive Summary

This project was born out of the need to gain insight into consumers' subjective reactions to, and preferences for, different aspects of live captioning in Canada, in order inform a broader understanding of how to improve the quality of live captioning in Canada. The project was funded by the Broadcasting Accessibility Fund (BAF) and governed by a Steering Committee comprising of members of the Captioning Consumer Advocacy Alliance (CCAA), broadcasters and captioners.

The scope of the project included a qualitative research phase, in which the research design was undertaken; a quantitative research phase, in which Canadian deaf, hard-of hearing and hearing captioning consumers responded to an online survey; and a reporting and dissemination phase.

In total, 550 responses were received for the survey, 330 from the deaf and hard-of-hearing communities and 220 from the hearing community. Respondents to the survey were asked a series of questions on viewing behaviour, the importance of live captioning attributes, their satisfaction and experience of captioned live TV segments, and demographics. The questionnaire was available in English and ASL.

Live captioning is important across all genres, but News/Weather achieved the highest importance rating across the four genres included in the survey. Satisfaction with the general state of live captioning in Canada is moderately high, although respondents from the deaf and hard-of-hearing communities are significantly less satisfied with the quality of live captioning in Canada than those from the hearing community.

Captioning speed was ranked as the most important attribute amongst the hearing and hard-of-hearing respondents, followed by captions not obscuring important information on screen, the meaning of what was said not being changed, and that there should be little or no delay between what is said on screen and the captions appearing on screen. Respondents from the deaf community prioritized low delay and important onscreen information not being blocked by captions. Captioning every word spoken on screen was their third most important attribute, and significantly more important than maintaining the integrity of meaning. Caption speed was the fourth most important attribute to deaf respondents.

Overall, respondents across all hearing groups were ambivalent about the quality of the live captioning of video segments presented to them, with almost as many respondents registering a sense of dissatisfaction as respondents who registered satisfaction across the different genres and captioning methods. There was also little to differentiate between video segments in terms of overall satisfaction ratings.

When evaluating specific captioned live video segments, more than half of all respondents rated ‘Caption Legibility’, ‘Spelling and Grammar’ and ‘Placement of Captions’ highly, while ‘Speaker Identification’ (where relevant), ‘Delay’ and ‘Caption Speed’ received the lowest performance ratings.

In the key driver analysis, ‘Delay’ emerged as the most important driver of viewer satisfaction across all video segments, regardless of hearing status (i.e. hearing vs. hard-of-hearing vs. deaf). ‘Caption Speed’ and the correct ‘Spelling and Grammar’ vied for second place, but this was dependent on the genre of the captioned segment.

This survey of was the first of its kind in Canada and has provided some important insights into user responses to live closed captioning in Canada. The responses recorded in this survey reaffirmed that there are three pivotal captioning attributes of importance to users, namely, delay, speed, and accuracy, and that performance in these variables is not as high as users want. An ideal balance would provide accuracy of meaning at readable speed with minimal delay. Whether this goal is feasible within the current state-of-the-art is, unfortunately, not within the scope of this project.

Overview and Background

Television is an almost ubiquitous medium that provides entertainment and vital information to millions of households in Canada. Closed captioning of live television programs, which is particularly challenging, extends the accessibility of these programs to the Deaf, deafened, hard-of-hearing and hearing communities.

An Accuracy Standard for captioning has been part of the CRTC's Standards for Quality in Closed Captioning since 2012, but the method of assessment defined there has proved to be ineffective and unworkable. As a result, the Commission started a new proceeding on this issue. In December 2015, members of the English Broadcasters Group (EBG) met with members of the Captioning Consumer Advocacy Alliance (CCAA), in response to CRTC Broadcasting Notice of Consultation 2015-325-2, to address aspects related to a closed captioning quality standard for live television programming in Canada.

The EBG and CCAA reached agreement on a common purpose, namely to improve the quality of live captioning in Canada. One of the outcomes of the discussions was to recognize that an appropriate system for measuring accuracy needs to be found. It was agreed that the NER model should be evaluated as a potential system of assessing caption accuracy in Canada. This ultimately led to a CRTC-supported two-year trial of a Canadianized NER model.

One of the challenges was the lack of substantive research into consumers' subjective reactions to, and preference for, different forms of live captioning in Canada, which was considered an important factor limiting the ability to improve accessibility in live television programming. The CCAA, with EBG support, decided to pursue an independent research initiative aimed at establishing users' preferences and responses to different aspects of live captioning in Canada. A proposal to conduct such research was submitted to the Broadcasting Accessibility Fund (BAF). The application for funding was successful and the project, titled Understanding User Responses to Live Closed Captioning in Canada, was formally launched in November 2016.

This document outlines some of the key findings of the User Responses Survey.

Project Objectives

The primary objective of this project was to better understand subjective live captioning preferences, across demographic profiles (i.e. different closed captioning user classes), in Canadian content, to inform the development of products and services, thereby improving accessibility in broadcasting. The research focused on consumers' subjective reactions to live captioning, a matter that was hitherto not clearly understood, but which is considered very important to progress on improving accessibility to broadcasting.

Project Sponsor and Steering Committee

This project was made possible through the sponsorship of the Broadcasting Accessibility Fund.

Project direction was set by a Steering Committee comprising members of the Captioning Consumer Advocacy Alliance (CCAA), broadcasters and captioners, as follows:

- **James Roots**, Executive Director of the Canadian Association of the Deaf – Association des Sourds du Canada (CAD-ASC), Chair of the Steering Committee and Project Leader. CAD-ASC is a member of the CCAA.
- **James Hardman**, representing the Canadian Hearing Society (CHS). CHS is a member of the CCAA.
- **Cindy Gordon**, representing the Canadian Hard of Hearing Association (CHHA). CHHA is a member of the CCAA.

- **Beverly Milligan**, representing Media Access Canada (MAC). MAC is a member of the CCAA.
- **Jessica Miller**, representing Bell Media
- **Mike Menard**, representing Corus Entertainment
- **David Keeble**, an independent consultant representing Bell, Rogers, CBC and Corus from the English Broadcasters Group, and Chair of the NER Evaluation Committee
- **Melina Nathanail**, representing National Captioning Canada

Project Description

The project was broken down into three phases, as follows:

Phase 1: Qualitative Research – which involved an international literature review, engagement with Canadian and international experts in live captioning, and participation of the Steering Committee in preparing and approving the research design.

Phase 2: Quantitative Research – in which the user responses survey was conducted online in English and ASL. Leger was selected as the research supplier.

Phase 3: Final report Preparation and Dissemination – in which the final project documentation was prepared.

About the Research

Research Design

The questionnaire consisted of five main sections:

- Screener, which was used to ensure that only qualified respondents answered the survey, and to manage quotas
- Viewing behaviour
- Overall satisfaction with the state of live captioning in Canada and a ranking of the importance of twelve live captioning attributes
- Ratings of live captioned segments, in which respondents were asked to rate two video segments from four different genres, namely, News/Weather, Live Sports, Sports News, and Talk Shows. Each genre had a video segment captioned differently, and hence eight video segments were evaluated. All respondents rated a News/Weather video segment. Detailed ratings were obtained across five or six attributes, as appropriate to the video segment.
- Demographics

Research Execution

The research was conducted within the following parameters:

- The survey was conducted online
- The survey engaged respondents from the following groups: Deaf, Hard-of-hearing and Hearing
- The respondent could choose whether to do the survey in English or American Sign Language (ASL)
- Hearing respondents were recruited from the Leger panel
- Deaf and hard-of-hearing respondents were recruited through stakeholders on the Steering Committee, and to a lesser extent, via social media
- In order to qualify, respondents had to be resident in Canada and had to have viewed captions on live television programming in Canada in the last six months
- The fieldwork started in October 2017, and the survey was closed on April 15, 2018

- The survey took approximately 25 minutes to complete
- A prize draw was offered to respondents for completing the survey

A total of 550 respondents completed the survey. The following table summarizes the sample profile across different groups.

Group	#	%
Hearing	220	40.0%
Deaf	157	28.5%
Hard-of-hearing	173	31.5%
TOTAL	**550**	**100.0%**

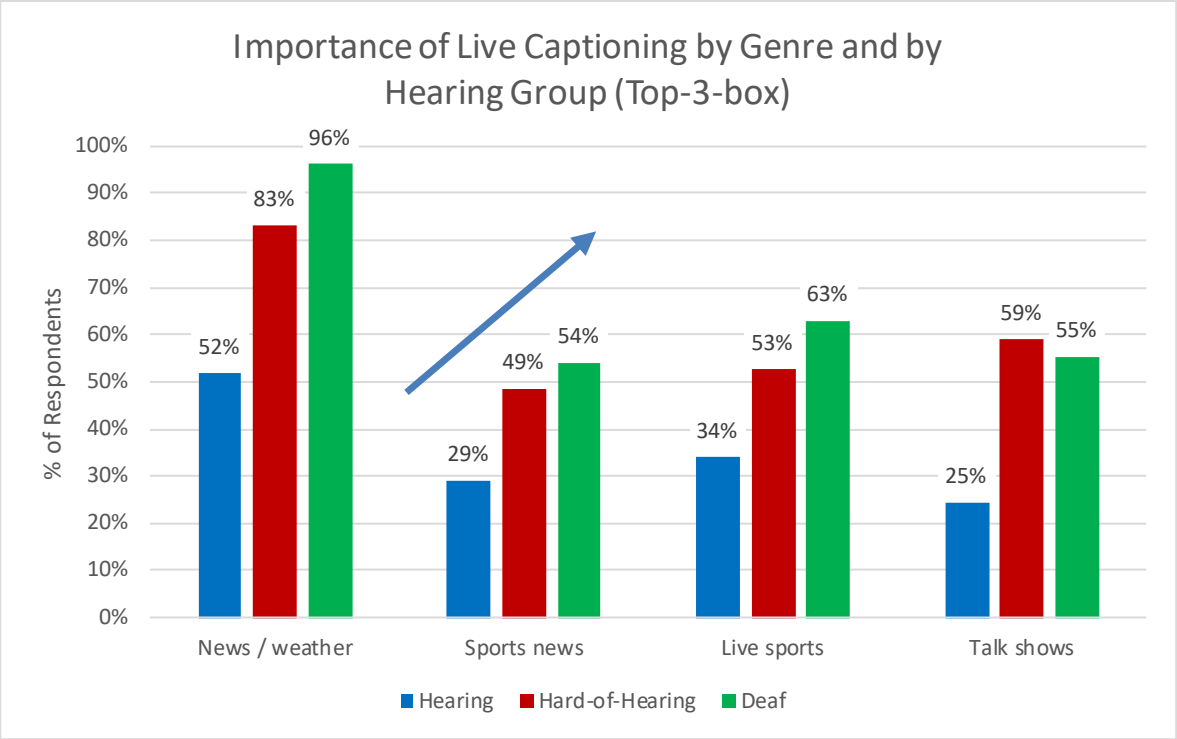
A total of 468 respondents completed the survey in English, while the remaining 82 completed it in ASL.

The table below shows the breakdown of the sample by different demographic groups:

Group	**Description**	#	%
Gender	Female	289	53%
	Male	251	46%
Age	18-34	118	21%
	35-64	435	61%
	65+	93	17%
Region	West	223	41%
	Ontario	262	48%
	Quebec	22	4%
	Atlantic	43	8%
	TOTAL	**550**	**100%**

The Importance of Live Captioning

Live captioning is vitally important to enriching the viewing experience amongst Canadians. The importance attached to live captioning varies by genre, with 74% of all respondents saying that live captioning is very important for News/Weather, and more than four out of ten respondents saying that it is important for all other genres. Not surprisingly, deaf and hard-of-hearing respondents attach more importance to live captioning across all genres than hearing respondents, with 96% of deaf respondents and 83% of hard-of-hearing respondents saying that live captioning is important for News/Weather. What is perhaps surprising is the level of importance attached to live captioning by hearing respondents, with 52% saying that it is important for News/Weather.

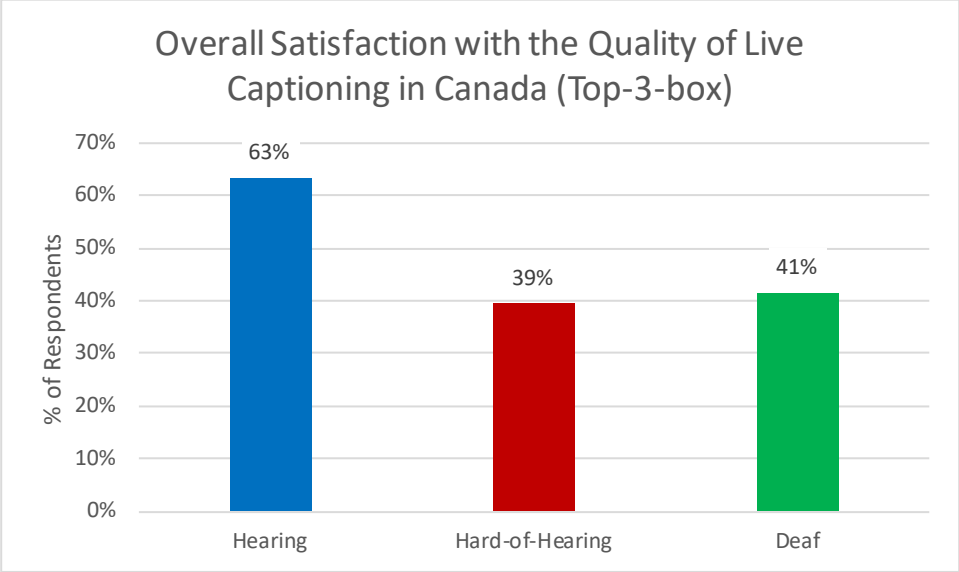


> *"Because I am profoundly hard of hearing, live captioning is the only way to ensure that I actually have a chance to understand what is going on."*
>
> *"Live captioning is mandatory for me because I am deaf. I can't imagine watching live TV without captioning"*
>
> *– Deaf and hard-of-hearing respondents*

For viewers that watch each of these genres often, the importance rating tends to increase even further. For example, 81% of deaf respondents, 63% of hard-of-hearing respondents and 48% of hearing respondents who watch live sports often feel that captioning is important for live sports programs.

Overall Satisfaction with Live Captioning in Canada

Prior to viewing any video segments respondents were asked to rate their overall satisfaction with the quality of live captioning in Canada. The rating was done on a ten-point scale.



Respondents from the deaf and hard-of-hearing communities are significantly less satisfied with the quality of live captioning in Canada than those from the hearing community. This demonstrates a somewhat inverse relationship with importance ratings and suggests that the less important live captioning is to a particular respondent group, the higher the quality rating is likely to be.

"Live captioning is terrible in Canada. News stations seem to be a bit better than local news stations, which are a disaster."

"Overall the quality is good. And it's great that captioning is a requirement so that, any technical problems aside, captioning is available."

"I like that live captioning is offered and continues to improve its quality with time."

– Deaf and hard-of-hearing respondents

The Importance of Live Captioning Attributes

There are many factors affecting the quality of live captioning of television programs. In producing live captions, the captioner is faced with some trade-offs between different factors that affect how captioning is delivered. For example, for a captioner to capture every word that is said on screen may mean that the caption speed is too fast for most people to read, or people watching the program may need to spend most of their time reading captions rather than looking at what is happening on the screen. If the captioner cannot caption at the speed of what is being said on the screen because it is too fast, there will be a delay between the spoken word and captions, or the captioner may need to paraphrase what is said, which may make it difficult to understand what is happening on screen.

In this section of the survey, respondents were asked to rank the importance of twelve attributes that affect captioning quality, where a rank of one signifies the highest rank, or most important factor. The table below summarizes the findings:

Live Captioning Attribute	Hearing	Hard-of-Hearing	Deaf	Overall Ranking
The captions should be presented at a speed which makes them easily readable	1	1	4	1
Captions should not block or obscure any important information on the screen	2	2	2	2
There should be little or no delay between what is said on screen and the captions appearing	4	4	1	3
The meaning of what was said or portrayed should not be altered in any way (i.e. added to, changed, or omitted)	3	3	7	4
Captions should identify the speaker in situations where there are multiple speakers	5	5	6	5
Every word spoken on screen should be captioned	7	6	3	6
The spelling and grammar used in captions should be exactly correct	6	7	5	7
Captions should reflect the mood (e.g. excited, angry) and tone (e.g. shouting, whispering) of what is said on screen	8	10	8	8
Captions should provide cues to show that content has been omitted	11	8	10	9
Captions should provide an indication of any sound effects (e.g. wind blowing, applause, etc.)	10	9	9	10
Captions should show whether music is playing	9	11	11	11
Captions should make use of emoticons, emojis or symbols to make reading them easier	12	12	12	12

Captioning speed was ranked as the most important attribute amongst the hearing and hard-of-hearing respondents, followed by captions not obscuring important information on screen, the meaning of what was said not being changed and that there should be little or no delay between what is said on screen and the captions appearing.

> *"With all the action and sound it is very difficult to read and comprehend at the same time, especially with the captions moving so fast."*
>
> *– Hearing respondent*

Delay and caption speed are inversely related for a given speech rate – i.e., the faster the speed, the smaller the delay. Captioning speed is, however, often determined by the abilities of the captioner, who may be unable to caption as fast as the words being spoken on screen, and hence a delay is inevitable if every word is to be captioned. Respondents from the hearing and hard-of-hearing communities ranked the attribute related to maintaining the integrity of meaning as their third most important attribute, but having every spoken word captioned as their seventh most important attribute. This would imply that for these groups, judicious editing, if it were feasible in live captions, would be acceptable, provided that the meaning of what was being said was not changed.

Respondents from the deaf community prioritized low delay and important onscreen information not being blocked by captions. Captioning every word spoken on screen was their third most important attribute, and apparently significantly more important than maintaining the integrity of meaning, although it seems reasonable to assume that captioning every word ensures the integrity of meaning. The speed at which captions appear onscreen is the fourth most important attribute to deaf respondents. Once again, the difficult trade-offs in live captioning are apparent since low delay, acceptable caption speed and verbatim captioning are all important but cannot necessarily be satisfied simultaneously.

> *"I realize the difficulty in providing live captioning, but the captions need to be in an easy place to read, not blocking information. With all of the errors, it is difficult to figure out what was said. It is also hard to follow if the captions are too slow and delayed. Imagine the frustration of watching TV only by this system. After an hour or less you are exhausted, and your brain is tired. I need closed captioning to watch live tv, and I miss out on so much trying to read fast or decipher mistakes and delayed typing"*
>
> *– Deaf respondent*

Evaluation of Video Segments

In order to gain insight into user responses to live captioning, four three-minute video segments from four different genres (News/Weather, Sports News, Talk Shows and Live Sports), each captioned in two different ways, were used as stimuli for the research. Each respondent was asked to view a video segment and then rate

it in terms of their overall satisfaction with the captioning of the segment, and against different performance attributes, as follows:

- Caption speed
- Caption placement (blocking or obscuring important information on the screen)
- Delay
- Speaker identification (where applicable, i.e. in the Sports News and Talk Shows segments)
- Spelling and grammar
- Caption legibility (based on the assertion that if the respondent did not find the captions to be legible, other ratings would be affected)

Some of the variables that were ranked in terms of importance were left out of the video segment evaluation because they were either too difficult to evaluate or were dichotomous. For example, none of the video segments achieved perfect verbatim captioning and hence asking respondents to rate performance on verbatim captioning would not have resulted in a meaningful rating since all segments should have failed. As another example, assessing whether what was said on screen was reflected accurately in the captioning in terms of meaning would require a detailed comparison of the segment transcripts and caption files, which was not available to respondents, nor was it feasible to do such an assessment in this survey.

Each respondent conducted performance ratings for two video segments (from different genres). All respondents rated one of the two News/Weather segments (captioning methods 1 and 2) to provide a common reference point across all respondents. The segments used were as follows:

Segment	Content
News/Weather	Weather report
Live Sports	Ice hockey
Sports News	Panel discussion on ice hockey
Talk Shows	The Social – panel discussion

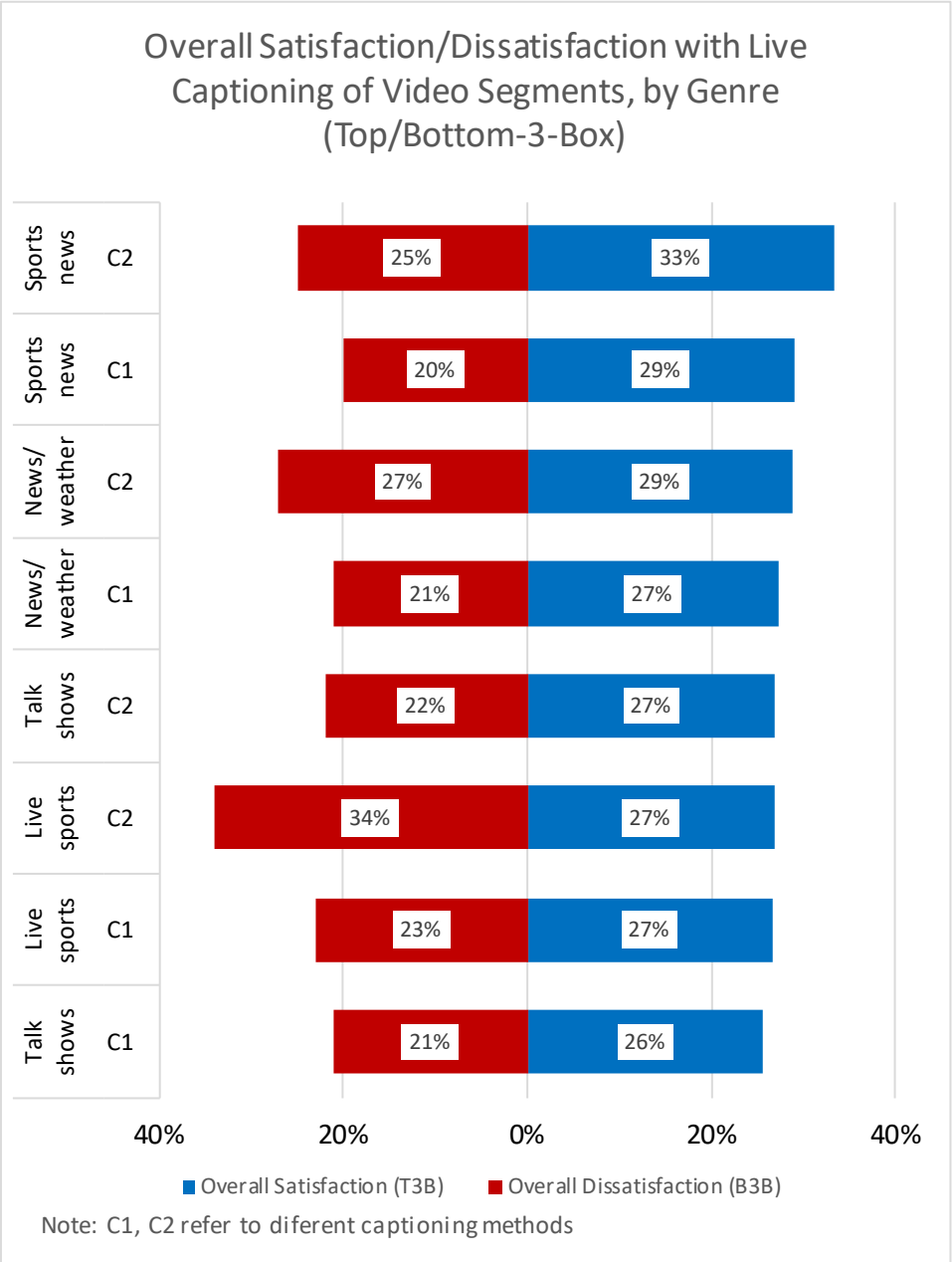
Quality of Captioned Live Video Segments, by Genre

Overall, respondents across all groups were ambivalent about the quality of the live captioning of video segments presented to them, with almost as many respondents registering a sense of dissatisfaction as respondents who registered satisfaction across the different genres and captioning methods (see chart below). The average overall satisfaction scores, based on a 10-point scale, were in the 5 to 6 range, which suggests that respondents across the board were not delighted with the quality of captioning of the segments that they viewed.

There was also little to differentiate between video segments in terms of overall satisfaction ratings. Sports News (captioning method C2) achieved the highest overall satisfaction ratings, with 33% of respondents giving it a high satisfaction rating (top-3-box on a 10-point scale). This was, however, not substantially different from the 26% of respondents who gave the Talk Shows video segment (captioning method C1), which received the lowest overall satisfaction rating across all video segments, a high overall satisfaction rating (top-3-box).

For the most part, the proportion of respondents who were dissatisfied (bottom-3-box) with the live captioning of the presented video segment tended to be lower than those who were satisfied with the captioning of the segment. There was, however, one exception, namely with captioning of the Live Sports segment (captioning

method C2), where the proportion of dissatisfied respondents was higher than satisfied respondents. Live sports is a particularly challenging genre to caption effectively, and there is some debate as to whether captioning is even worthwhile given the place of play in some fast-moving sports, such as ice hockey.

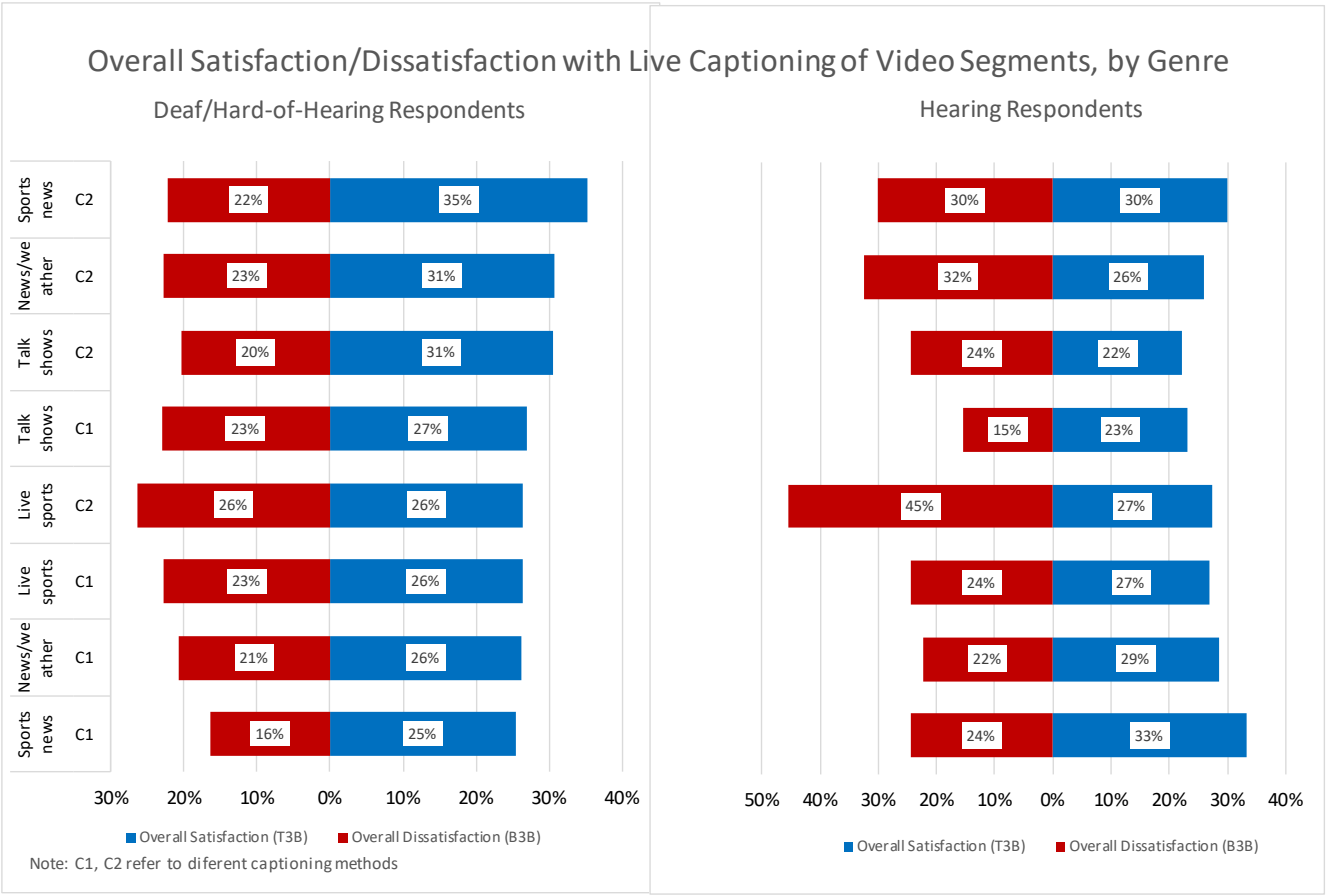


> *"Local news leaves me so frustrated I could scream! Unfinished sentences, omissions, scrolling so fast that it's unreadable. Newscasters speak much too fast for captionists to keep up."*
>
> *– Deaf respondent*

Amongst the deaf and hard-of-hearing respondents, the results are not markedly different from that of respondents in the hearing group in terms of overall satisfaction ratings. Similar proportions of deaf and hard-of-hearing respondents gave high satisfaction ratings (top-3-box) across the different genres, ranging between 25% and 35%. They did, however, tend to be less dissatisfied, on average, than those respondents from the hearing group.

Captioning of fast-paced live sports faces specific challenges because the speed of spoken words tends to be very high in the attempt to follow the action on the screen. Some 45% of hearing respondents felt dissatisfied with the quality of captioning of the Live Sports video segment (ice hockey) using captioning method C2, the highest dissatisfaction level recorded across all consumer groups and all genres. This could be a result of hearing respondents having access to the spoken word and realizing that captioning of the segment did not do justice to what was said on screen. This was the same video segment that received the highest dissatisfaction levels amongst the deaf and hard-of-hearing respondents, although only 26% of respondents in this group were dissatisfied.

> *"Impossible to watch for sports. Paraphrasing might work here or having totally independent commentary from the spoken one. I usually turn them off and just watch (with or without sound)."*
>
> *"The sports are way too fast for me to read any of it."*
>
> *– Deaf and hard-of-hearing respondents*

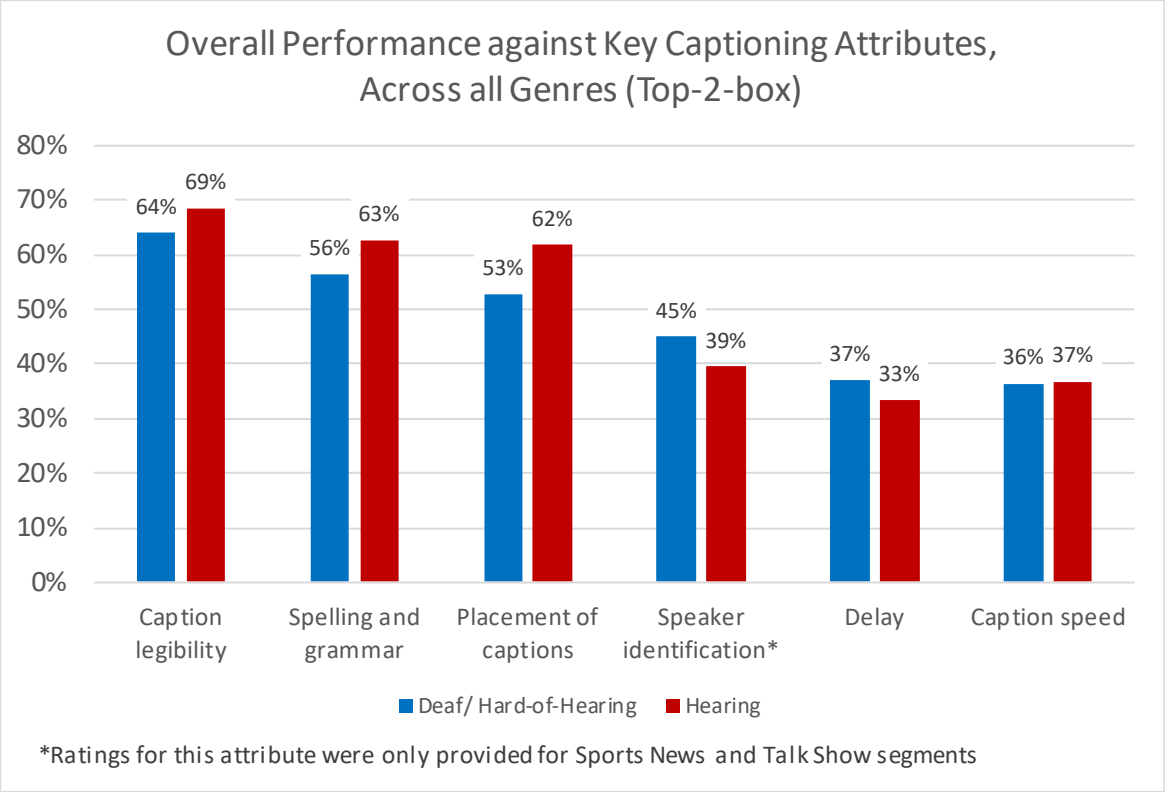


Performance against Key Attributes

As noted previously, respondents were asked to evaluate the captioning of the video segments presented to them against a set of key performance attributes. Ratings were done on a 5-point scale. More than half of all respondents rated 'Caption Legibility', 'Spelling and Grammar' and 'Placement of Captions' in the top-2-boxes of the scale, signifying that most respondents felt that the video segments that they viewed performed well on these measures.

'Speaker Identification', 'Delay' and 'Caption Speed' received the lowest performance ratings.

> *"Sometimes it is hard to follow because the captions are so delayed that they don't match what is on the screen, so I can't follow what is happening. Sometimes they cover important information on the screen so I don't know which person is talking."*
>
> *– Hard-of-hearing respondent*



> *""It's a double edged-sword: I need time to be able to process the captions (so they can't be too fast) but I don't like missing out on information. I'm more in favour of limited summarization. It's easier to digest the content when I have time not only to read it, but also have a moment to process it after reading it. If the captions run by too quickly, I might read them all, but forget what I just read because I'm trying to keep up to the rapid flow of text."*
>
> *– Hard-of-hearing respondent*

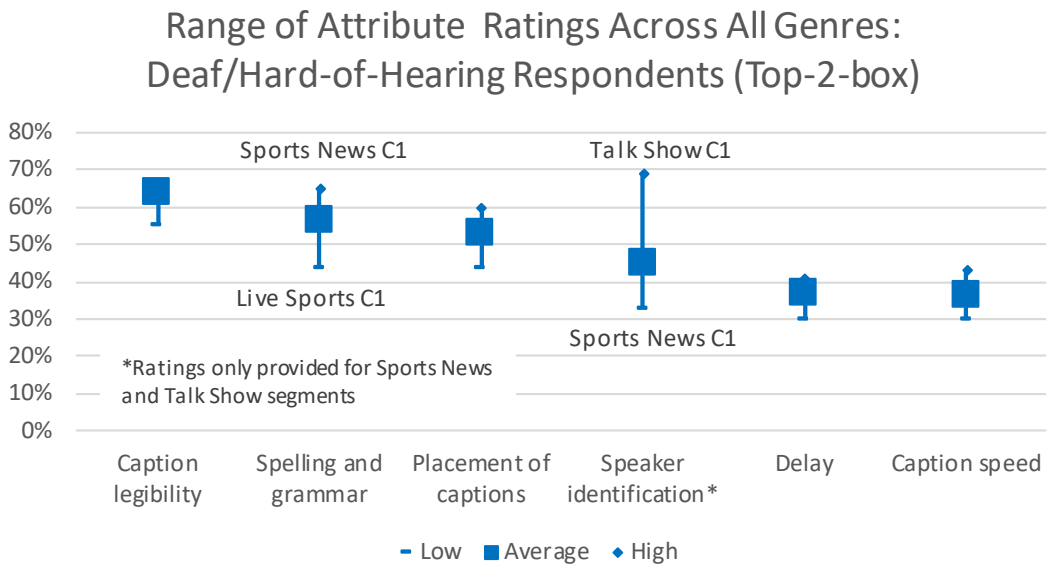
A smaller proportion of respondents who were deaf or hard-of-hearing provided favourable ratings across most attributes than hearing respondents, except for the 'Speaker Identification' and 'Delay' attributes.

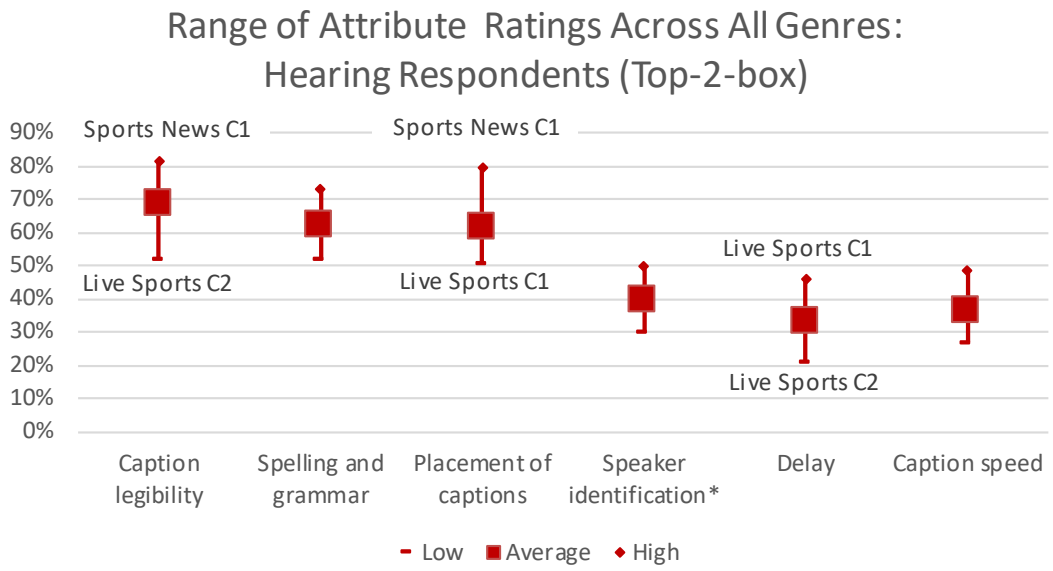
The general rank order that emerged from the ratings was similar for the deaf/hard-of-hearing and hearing groups of respondents.

The range of top-2-box scores amongst deaf and hard-of-hearing respondents was highest for the 'Speaker Identification' attribute, in which the Talk Shows C1 segment scored the highest and the Sports News C1 segment scored the lowest. 'Spelling and Grammar' also exhibited a moderately wide range amongst this group of respondents, with Sports News C1 performing the best and Live Sports C1 performing the worst.

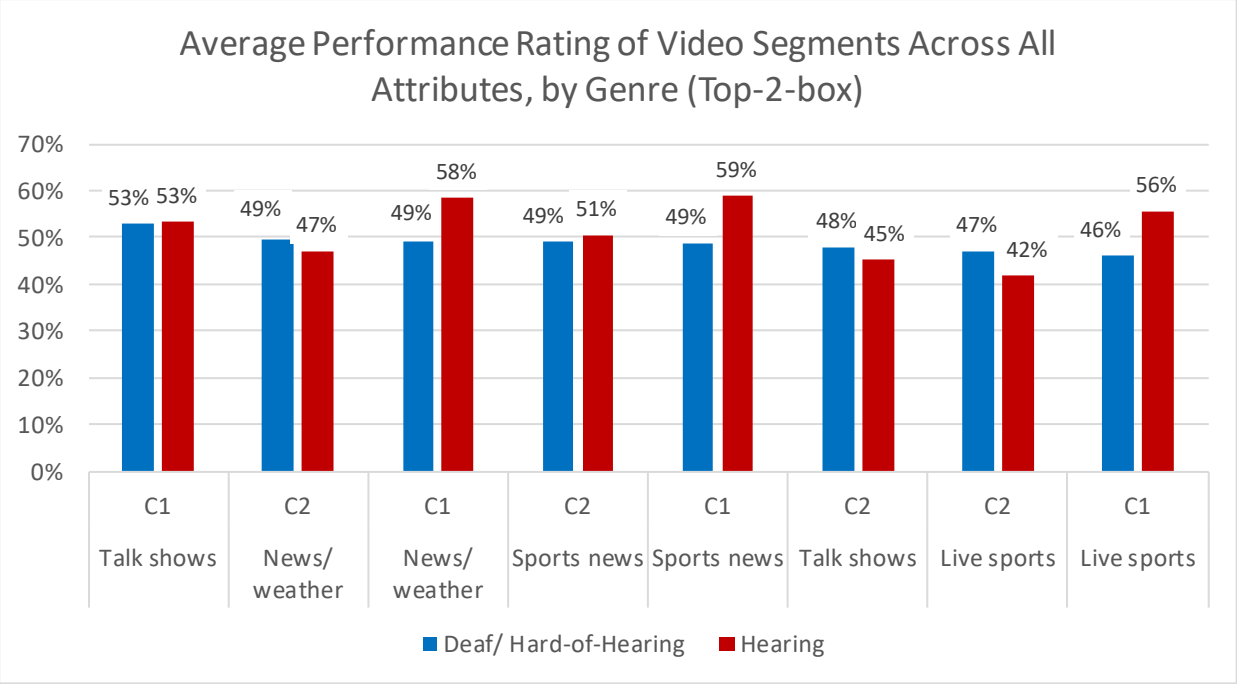
Amongst hearing respondents, 'Placement of Captions' exhibited the widest range, followed by 'Caption Legibility' and 'Delay'.

> *"After watching the video on the hard work that goes into live closed captioning I hesitate to complain. The frustrating things are the delay, garbled words, missed conversations, clumps of words going too fast."*
>
> *– Hard-of-hearing respondent (with cochlear implant)*





Across genres, Live Sports C2 received the lowest proportion of top-2-box scores amongst hearing respondents, while Sports News C2 received the highest proportion. Talk Shows C1 received the highest proportion of top-2-box ratings amongst deaf and hard-of-hearing respondents, while Live Sports C1 received the lowest.

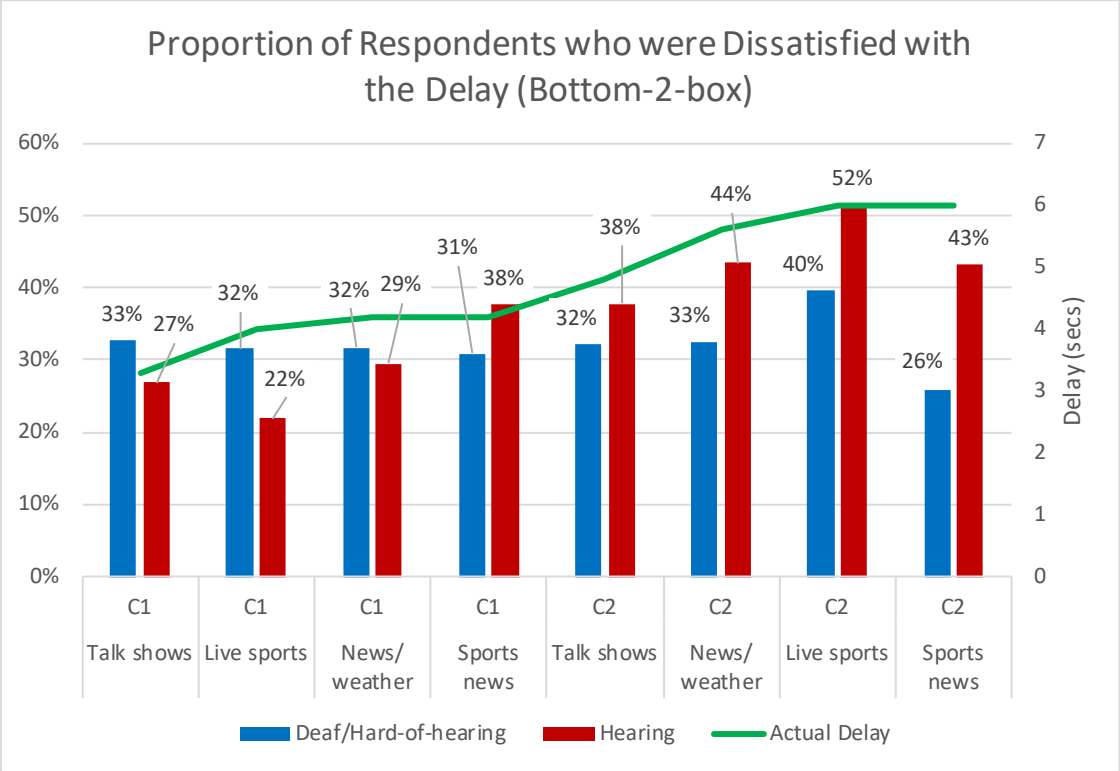


Delay between the spoken word and when the associated captions appear onscreen, while inevitable in live captioning, is one of the aspects that tends to have the greatest impact on the viewer satisfaction. This is one of the few metrics for which we had actual data for each of the video segments. As shown in the chart below, hearing respondents appear to be more sensitive to the quantum of delay, since their dissatisfaction scores tend to increase more quickly with increasing delay levels.

"Too many times the captioning is delayed 2-4 lines behind the spoken word, and it is totally distracting and frankly, it becomes a hopeless exercise in watching."

"Sometimes live captioning has a delay so that it cannot complete the 'sentence' of the speaker. The captions go to the next sentence. Also, there are sometimes too many insertions like [music], [whisper], [muffled speech] that reading becomes interrupted, crowded, and confusing and there is inconsistent flow."

– Hard-of-hearing respondents



> *"When the captions are delayed, I am so busy reading and figuring out who said what and what they are referring to that I miss a lot of the information. Usually the captions are cut off at the end of the segment, so I miss the last part of the program. I don't like the fact that because the captioning is delayed, sometimes the captioning goes very fast on the screen in order to catch up and I can't read it."*
>
> *– Hard-of-hearing respondent (with cochlear implant)*

There appears to be no discernible relationship between the actual caption speed measured on video segments and the satisfaction or dissatisfaction ratings of caption speed amongst either hearing or deaf and hard-of-hearing respondents across the different video segments.

As noted previously in this report, respondents were not asked to assess whether what was said on screen was reflected accurately in the captioning in terms of meaning. In order to address this question, each of the eight video segments was rated independently in accordance with the NER model, a system designed to measure accuracy of meaning in captioning. User ratings of satisfaction with the quality of captioning of the video segment appears to increase with increasing NER score amongst both hearing and deaf/hard-of-hearing respondents, suggesting that there may be a relationship between NER score and user satisfaction. The sample of eight video segments is not sufficient to provide conclusive evidence of this, and points to the need for further investigation of this important topic.

In addition to the analyses conducted above, a key driver analysis was conducted, at respondent level, to assess the importance of each of the different live captioning attributes evaluated in this study in determining overall satisfaction with each of the video segments. This advanced statistical analysis was performed using Shapley-Value regression to address the multicollinearity issue that can arise among independent variables. The analysis revealed three important insights:

- Delay is the most important factor in captioning satisfaction across all video segments, regardless of hearing level (i.e. hearing vs. hard-of-hearing vs. deaf).
- Caption Speed is an important driver of satisfaction across all genres, being the second most important driver for News/Weather and Sport News segments and the third most important for other segments.
- Correct spelling and grammar are the second most important driver of satisfaction for Live Sports and Talk Shows segments, and the third most important for the other segments
- There are no significant differences in attribute importance between hearing, hard-of-hearing, or deaf respondents.

"Poor spelling and grammar make me cringe because it makes me feel like standards for education and comprehension are low."

"Too many mistakes are very annoying! It is also annoying when the speaker is finished speaking and the captioning is not, and the captioning just ends.

– Deaf and hard-of-hearing respondents

Conclusion

This survey was the first of its kind in Canada and has provided some important insights into user responses to live closed captioning in Canada. Readable caption speed, low delay, unaltered meaning/high accuracy, and caption placement so as not to obscure important onscreen information were selected by respondents as the most important captioning attributes. While the overall sense of satisfaction with live captioning in Canada was relatively high, satisfaction with the actual video segments viewed was substantially lower.

'Caption legibility', 'Spelling and Grammar' and 'Placement of Captions' achieved the highest performance ratings from respondents, while 'Speaker Identification', 'Delay' and 'Caption Speed' received the lowest performance ratings overall. 'Delay' and 'Caption Speed' also emerged as key drivers of satisfaction across all video segments in the Shapley Value regression analysis.

Verbatim accuracy, delay and caption speed are three key trade-offs in live captioning. Verbatim accuracy may require delivery of captions at a high speed if delay is to be kept at acceptable levels, whilst high verbatim accuracy at a readable speed will necessarily result in longer delays for programming with a high spoken word rate. The responses recorded in this survey reaffirmed that all three of these variables are of importance to users, and all have an important impact on viewer satisfaction.

Trade-offs seem to be inevitable. An ideal balance would provide accuracy of meaning at readable speed with minimal delay. Whether this goal is feasible within the current state-of-the-art is something that would need to be assessed in a separate initiative.