

Creating questionnaires that align with ASL linguistic principles and cultural practices within the Deaf community

Rachel Boll

Rachel_Boll@tlcdeaf.org

Center for Research and Training, The Learning Center for Deaf
Framingham, MA

Jeanne Reis

Jeanne_reis@tlcdeaf.org

Center for Research and Training, The Learning Center for Deaf
Framingham, MA

Shruti Mahajan

spmahajan@wpi.edu

Worcester Polytechnic Institute
Worcester, MA

Erin T. Solovey

esolovey@wpi.edu

Worcester Polytechnic Institute
Worcester, MA

ABSTRACT

Conducting human-centered research by, with, and for the ASL-signing Deaf community, requires rethinking current human-computer interaction processes in order to meet their linguistic and cultural needs and expectations. This paper highlights some key considerations that emerged in our work creating an ASL-based questionnaire, and our recommendations for handling them.

CCS CONCEPTS

• **Social and professional topics** → **Assistive technologies**.

KEYWORDS

American Sign Language, ASL, questionnaires

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1 INTRODUCTION

In the U.S., American Sign Language (ASL) is the primary language of many deaf adults. However, most interactive computing tools are presented and navigated exclusively in English, even those designed for deaf audiences. A goal of our work is to remove the prerequisite of fluency in a second language (English, in US) to access online resources. To do this, we are engaging in an iterative cycle of studying perceptions and use of technology among deaf and hard of hearing people, rapidly prototyping new user interface

paradigms optimized for individuals who primarily use ASL, integrating them into software platforms, studying perceptions, and then again examining use.

This paper focuses on considerations that have emerged from our experience developing questionnaires for ASL-signing participants, that go beyond standard considerations in questionnaire development (e.g. [11]). Our aim is to conduct research in ways that are respectful to deaf participants [1, 7, 13, 16]. In the development of a demographic questionnaire in ASL, we encountered several challenges in both technical and linguistic-cultural areas that needed to be overcome. The questionnaire was designed to be distributed to the wider Deaf community whose members include deaf, hard of hearing, deafblind and hearing individuals. Question and answer options were delivered in ASL and were composed and shared in short video clips.

Previous work has looked at translating existing questionnaires to ASL [1, 7], discussed accessible and culturally-aware research methods [6, 14] and used ASL questionnaires for data collection [2, 4, 9, 17, 18]. The unique needs of the population require adaptation of typical human-centered computing approaches to better align with the linguistics of ASL and other visually oriented elements that are intrinsic to Deaf Culture [1, 7, 15].

2 TOWARDS ASL QUESTIONNAIRES

The questionnaire in development contains demographic data and questions about technology usage and experience. It is made up of multiple choice and Likert scale questions. Current resources, such as Google forms, SurveyMonkey, Jotforms and Qualtrics, are optimized for text and written languages, rather than video and signed languages, and therefore lack the ready-made features needed to deliver questions and answer options in ASL. As a result, development of even a basic ASL questionnaire requires effort far beyond what is needed to draft and revise a written questionnaire, such as currently used in HCI. The team's goal is to create ASL video materials for questionnaires that can be reused in future questionnaires and research efforts. We wish to note that our team is composed of native ASL-signing Deaf and hearing members, as well as hearing team members who are learning ASL.

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3 CHALLENGES AND EMERGING RECOMMENDATIONS

This paper focuses specifically on lessons learned in the development of reusable demographic questionnaires in ASL, and considerations required to go beyond current questionnaire development in HCI. Findings in this paper come from the pilot testing of our questionnaire with Deaf individuals, as well as the experience and background of our team.

Authorship. In ASL, the signer is continuously present in, and connected to, the ASL content. In written English, the author or designer is not visible. As a result, the signer in an ASL video may be seen as the sole author, even when there are multiple authors and contributors, which led to new considerations when creating questionnaires in ASL. For example, how should multiple authors be represented and acknowledged? Should a questionnaire be signed by the one person or several?

A potential authorship convention for ASL materials may be to depict and acknowledge all co-authors, collaborators and contributors at the beginning of each ASL video. If none are shown, this would indicate a single author, i.e., the individual signing the content.

Representation. We recognize that race and other factors impact and differentiate the Deaf community. Because signers are shown in ASL videos, representation considerations become more important, and may affect the comfort, willingness and responses of users. Critical questions in this area include: How does the signer's gender and race impact study participants and users? When demographic questionnaires ask about gender and race, does the signer's identity impact engagement and responses of study participants? This consideration highlights the fact that authors in written languages can be represented by name only, where race and gender are not always obvious, while anonymity is simply not an option in materials composed in signed languages.

Ensuring that individuals of different races and backgrounds are involved in the creation of questionnaires is likely to be highly beneficial in every stage of the development process. Creating materials with signing avatars could disassociate signed content from the author. However, avatars are not yet developed to the point that content is presented as fluidly and linguistically appropriately as a human signer, as signed languages are expressed in nuanced and sophisticated movements of the face, body and hands. Avatars are therefore not currently recommended or preferred by most members of the Deaf Community. [10, 19].

Privacy of Signer. With questionnaires conducted in signed languages, the privacy of the signer cannot be hidden or protected. The author of written materials can be obscured simply by not including their name. While a signer may be comfortable developing material designed for limited use, they may not be willing to allow wider dissemination, such as sharing their videos with other labs, at conference presentations, or with the public. Video materials could also be edited to portray a negative message with the signer's identity still present. Further consideration is needed for protecting the privacy of signers.

Creating materials with signing avatars would disassociate content from a signing author. Refer to the section above for considerations related to avatars [10, 19].

Language Skills. The language fluency and intuitions of the questionnaire development team are vital to creating linguistically and culturally aligned ASL materials. Essential skills include ASL and English fluency, experience with research and questionnaire development, and cultural and community competence. Additionally, developing high quality materials in ASL is a team effort, involving collaboration at every stage.

Our research team recruited and interviewed potential ASL content signers before selecting two who were best suited for the work. We began by administering the questionnaire with the ASL content signers to familiarize them with the questions. At that time, questions were also vetted and extensively revised. During filming sessions, we offered coaching, review and support to the ASL content signers. Due to the pandemic, support was offered via Zoom videoconferencing software, which was much more challenging than an in-person session for reasons outlined below.

Community-specific questions. Our demographic questionnaire included questions specific to the lives, education and experiences of Deaf people. One question pertained to whether the individual was born deaf or hard of hearing, or became so at a later age. This question is asked to help us distinguish between needs of sub-communities within the larger Deaf community. It is important to be thoughtful about whether there was a need to ask these types of questions, and to sequence questions carefully. The ASL-signing members of the team are aware of the identity terms deemed acceptable to the community; the terms used were Deaf; Hard of hearing; Late Deafened; and DeafBlind, as each of those is an identity group. Questions about educational placement categories were also included as preK-12 experiences significantly impact language experiences in both ASL and English. There are many potential placement options, so these questions required considerable revision and careful wording to avoid potential confusion or incorrect responses.

Our team feels it is critical to be thoughtful around questions related to identity and personal experiences, including them only when they relate directly to the research. We recommend that these questions be evaluated carefully with members of the community, to avoid pathologizing, medicalizing, or triggering participants [8, 12].

Platforms for Delivering Questionnaires. To deliver questionnaires in ASL, a platform would need to support video-based questions and answer options. Our team chose Qualtrics, which our institution had licenses for and which supports most of the technical needs. However, new conventions and considerations still arise. Challenges include the development of UI conventions, and the design and placement of question and response options. Because our questionnaires may be used in different contexts with wide distribution, we limited ourselves to multiple choice questions instead of short or long answer. This enables participants to provide responses without switching to English, or requiring the upload of ASL videos by participants. Most platforms do not support easy collection, uploading, storing, reviewing, tagging, and annotating of signed video data.

Audio Centric Collaboration Tools. Due to the global pandemic, the team was not able to conduct in-person meetings and filming sessions, so all meetings were held via Zoom instead, as it was found to have the best video quality. As with any technology, there were several challenges, including internet connectivity

and videos freezing. Comprehension of a three-dimensional signed language is more challenging in two-dimensional platform, which impacted our ASL interpreters most. Zoom's audio-centric features also interfered with ease of engagement, such as highlighting only English speakers (not ASL-signers) and not allowing users to reorganize video tiles (e.g., the Deaf researchers wished to put the interpreter in the middle, so they could see both the interpreter and hearing team members in adjacent frames). Repeated alerts to 'unmute' interfered with ease of participation for Deaf team members, as signers had to reject the alert each time they commented. Auto-spotlighting of the audio source (e.g. English-speaking team members) rather than spotlighting the active person presented another challenge for this team. While Zoom is preferred by our team over other videoconferencing platforms, there are still significant limitations in effectively supporting the needs of all users.

It would be helpful to have the option to turn off audio-centric features and to prioritize video over audio during times of lower bandwidth. The ability to rearrange video frames in video chat would be valuable. In one meeting the interpreter happened to be placed in the center of the Zoom meeting room. This placement allowed the ASL-signing team members to easily view all of the surrounding participants and at the same time have effortless access to the interpreted information. ASL is a visual language which means that all language is taken in through the eyes. Deaf people prefer to see and relate to the person talking, while viewing the interpreted message in close proximity. Centralizing the interpreter ensures that all participants are near the the interpreter.

Remote Video production. Ideally, our translation and video production team would create clear, high quality videos by collaborating in-person at a site with a formal filming studio. However, travel restrictions due to the global pandemic challenged us to develop all video materials without a single in-person session. The depth of ASL video production experience within the team was very helpful, but many adjustments were still needed due to COVID-19. All collaboration between team members was conducted on the Zoom videoconferencing platform. Protocols and equipment lists for home studios were tested and established. ASL content developers were trained in a number of video production tasks, such as setting up lighting, camera, and other equipment, running the camera, and uploading video to the cloud. This reduced our usual small pool of potential translators to those who could manage the additional technical skills. The equipment selected for the home studio worked well, and included the following: iPhone 11 Max Pro, a 10' x 10' grey backdrop, a 10' x 12' backdrop frame, 50 C-clamps (to attach backdrop to frame), 5 studio lights with dimmers, and a remote to turn on/off the iPhone video. A video production company reviewed the results, and confirmed the clips were almost equivalent to quality achieved in a formal shoot. The success of this experience offers potential for broader applications when creating ASL videos in home studios, even after the pandemic ends.

4 DISCUSSION AND CONCLUSION

This paper takes steps towards identifying challenges that arise when conducting research and development in ASL, and that slow research progress. Our team conducts human-centered research with and for the Deaf Community, which can only be done well

when Deaf researchers and contributors have lead roles, equal participation, and representation on the team. On such a team, medical and pathological views tend to be abandoned in favor of cultural and linguistic ones. Technology resources that are truly accessible to deaf SL-signers have the power to build on stronger first language foundations [3], facilitate lifelong learning, improve access to educational content such as STEM topics [5], improve career opportunities, and allow SL-based organization of SL corpora, dictionaries, learning resources and assessments. Carefully developing appropriate research methods to determine preferences, needs and optimized presentation of information for Deaf users will benefit ASL signers now and in the future.

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