

HeSLEx

*A novel online questionnaire for
heritage sign language research*

Evgeniia Khristoforova · University of Cologne

Roman Poryadin · University of Cologne



Roma Poryadin



dr. Anastasia Bauer

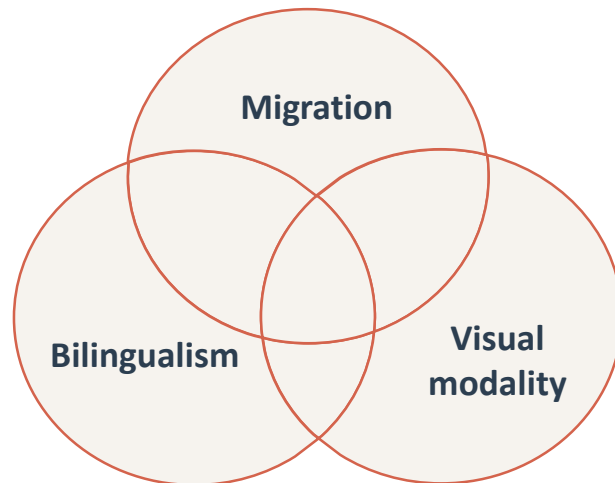
Rubicon project no.019.243SG.004 funded by the Dutch Research Council (NWO)

In collaboration with **dr. Anastasia Bauer** · University of Cologne

Why heritage sign languages?

Monolingual speakers are still treated as the gold standard in language research (Genesee, 2022). *But neither monolingualism nor the auditory modality is intrinsic to the human language faculty.*

Heritage sign languages sit at a unique crossroads:



KEY CLAIM

Heritage sign languages offer a unique window on the intersection between bilingualism in the visual modality.

...yet to date there is no systematic study of heritage sign languages (to be discussed later)

What is a heritage language?

A **minority language** used at home and in diaspora, while a different **dominant societal language** is used outside (school, work, official contexts).

(Montrul & Polinsky, 2021)

AT HOME

Heritage / minority language

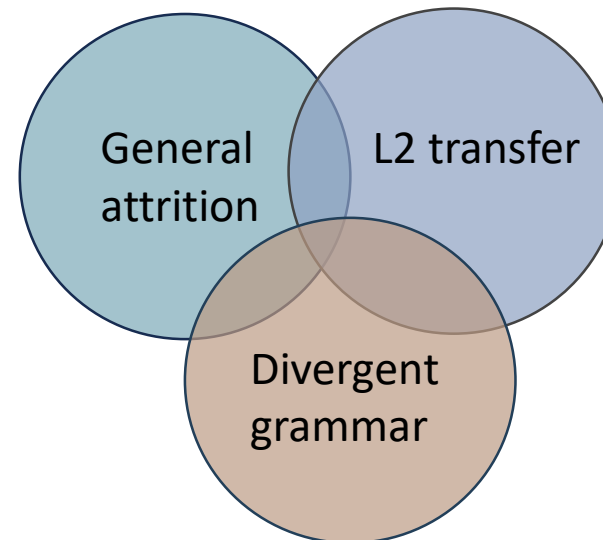
Limited input.
Restricted contexts of use.

OUTSIDE

Dominant societal language

School. Work. Officialdom.
Codified, well-resourced.

Heritage speakers' grammar often diverges from monolingual peers.



Polinsky 2018

Sign languages can be heritage languages too

Deaf families migrate. They form diasporas. They acquire and use the local sign language alongside their heritage sign language.

The pressure to switch to the societal sign language may be even greater for deaf signers than for hearing speakers — it can determine access to interpretation services (deaf schools) in the country of residence.

THE GAP

To our knowledge, there are **no comprehensive studies of heritage sign languages** — though Pichler et al. (2018) discusses CODAs as heritage signers; see also Pichler & Koulidobrova (2023) on American SL as L2 in deaf learners and MULDER project (PI: I. Holström): L2-Swedish SL (STS) deaf migrant learners

Russian Sign Language (RSL) signers in Germany

1980s

Migration wave
USSR/Russia → Germany

NRW

Settled in North
Rhine–Westphalia and other places in Germany

≈ 30–50

Estimated RSL signers
in the region, but potentially more

GENERATION 1 (G1)

- Acquired RSL before migration
- Learned DGS after arrival, now uses it daily
- RSL mainly restricted to family + community settings

GENERATION 2 (G2) — heritage signers

- Born in Germany OR migrated before puberty
- Grew up using RSL at home
- Acquired German Sign Language (DGS) early in local Deaf schools

Mapping the grammar of heritage RSL

We want to map the *grammatical properties of heritage RSL* — starting with **agreement and negation patterns**.

BASELINE

Monolingual RSL

signers in Russia

What RSL grammar looks like without contact / migration.

VS.

OUR FOCUS

Heritage RSL

(G1) + G2 in Germany

Where does it diverge? Where does DGS leak in?

VS.

TRANSFER SOURCE

DGS

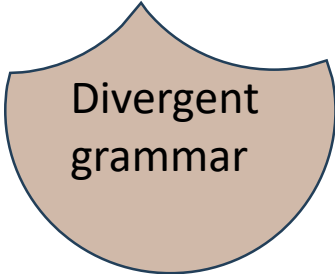
the dominant societal SL

The other SL signers know — likely source of L2 transfer.

CORPUS

To enable this, we are building the first **heritage sign language corpus** — *to share with the wider community*.

PROJECT GOALS



Mapping the grammar of heritage RSL

We want to map the *grammatical properties of heritage RSL* — starting with *agreement and negation patterns*.

BASELINE

Monolingual RSL

signers in Russia

What RSL grammar looks like without contact / migration.

VS.

OUR FOCUS

Heritage RSL

(G1) + G2 in Germany

Where does it diverge? Where does DGS leak in?

VS.

TRANSFER SOURCE

DGS

the dominant societal SL

The other SL signers know — likely source of L2 transfer.

CORPUS To enable this, we are building the first **heritage sign language corpus** — *to share with the wider community.*

Beware of the variation!

Studies of heritage spoken languages already show substantial variability. Four reasons make the situation even more complex for heritage signers:

1 No standardized curriculum

Most sign languages have no widely-recognized linguistic standard, no school curriculum, no institution to safeguard them — even in monolingual contexts.

2 No native writing system

Signers use the writing system of the surrounding spoken language. Heritage signers also lack a vast library of texts in their heritage language.

3 Very small communities

Deaf communities are minorities at home; their diasporas are smaller still. Smaller communities increase idiolectal variation (Raviv et al., 2019).

4 Bilingualism across modalities

Signers are routinely bilingual — and may be bilingual across both signed and written modalities, with schooling in two countries.

Document the sociolinguistic profile first

*Before any experiment or corpus analysis, we need a **standardized community profile** of each heritage signer.*

FOR HERITAGE SPOKEN LANGUAGES

HeLEx

Heritage Language Experience questionnaire (Tomić et al., 2023)

FOR HERITAGE SIGN LANGUAGES

→ HeSLEx

Heritage Sign Language Experience — our adaptation

HeLEx — Heritage Language Experience

DIMENSIONS: reading · writing · speaking · understanding

Tomić et al. (2023)

State-of-the-art survey of linguistic experience and life-history factors:

- Self-rated proficiency (4 modalities × up to 5 languages)
- Frequency of use across different contexts: home, family, work/school, leisure, community
- Code-switching patterns
- Identity & language attitudes (personal + community)

Please rate how well you speak, understand, read and write in each language. Enter the names of other languages in the fields if you speak languages other than Bosnian and Norwegian.

	Bosnian	Norwegian			
read How well do you read in these languages? Select "not relevant" if the language does not have a written form.	choose ▾	choose ▾	choose ▾	choose ▾	choose ▾
write How well do you write in these languages? Select "not relevant" if the language does not have a written form.	choose ▾	choose ▾	choose ▾ barely at all not very well pretty good very good not relevant	choose ▾	choose ▾
speak How well do you speak these languages?	choose ▾	choose ▾	choose ▾	choose ▾	choose ▾
understand How well do you understand these languages?	choose ▾	choose ▾	choose ▾	choose ▾	choose ▾

Fig. 1 from the paper · HeLEx for Bosnian heritage speakers in Norway
Original survey language: Bosnian

But: HeLEx is not designed for deaf participants and does not capture Deaf sociocultural factors relevant to acquisition and use.

● OUR INSTRUMENT

HeSLEx *builds on HeLEx and adapts it for Deaf migrant communities.*

- 1 Visual-first design (jsPsych)
- 2 Community-matched video + optional Russian/German text
- 3 Family hearing status & language repertoire
- 4 Education & Deaf-specific interactional contexts
- 5 Deaf-centered identity & intersectional attitudes
- 6 Modality-appropriate proficiency & slider scales

(also: planned video responses + reusable jsPsych plugin)

Visual-first design


Why minimize text?

Linguistic. Exposure to text can bias signers toward spoken-language-like structures (Morford et al., 2011).

Ethical. Sign language research relies on signers' linguistic knowledge and should respect their right to receive information in their native language.

BUILT IN

jsPsych



a JavaScript framework for browser-based behavioural experiments (de Leeuw, 2015); hosted on [Pavlovia](#) under the University of Cologne license.

vs. Gorilla / Qualtrics:
user-friendly but too rigid for the highly visual, multi-element layouts deaf users need.

We use the [jsPsychSurveyHTMLForm](#) plugin: customised HTML, precise positioning of videos and response interfaces, sliders, dropdowns.

Community-matched video + optional text

Each instruction, question and consent item is delivered as video.

Recorded by a Deaf G2 signer from the target community — fluent in both RSL and DGS.

Russian and German texts are tucked behind "Show text" buttons.

Signers fluent in RSL aren't forced into the written language. Those who need extra help with technical terminology can opt in.

TRANSLATIONS

Показать русский текст → Show Russian text

Deutschen Text anzeigen → Show German text

Имя · Name → placeholder "Name"

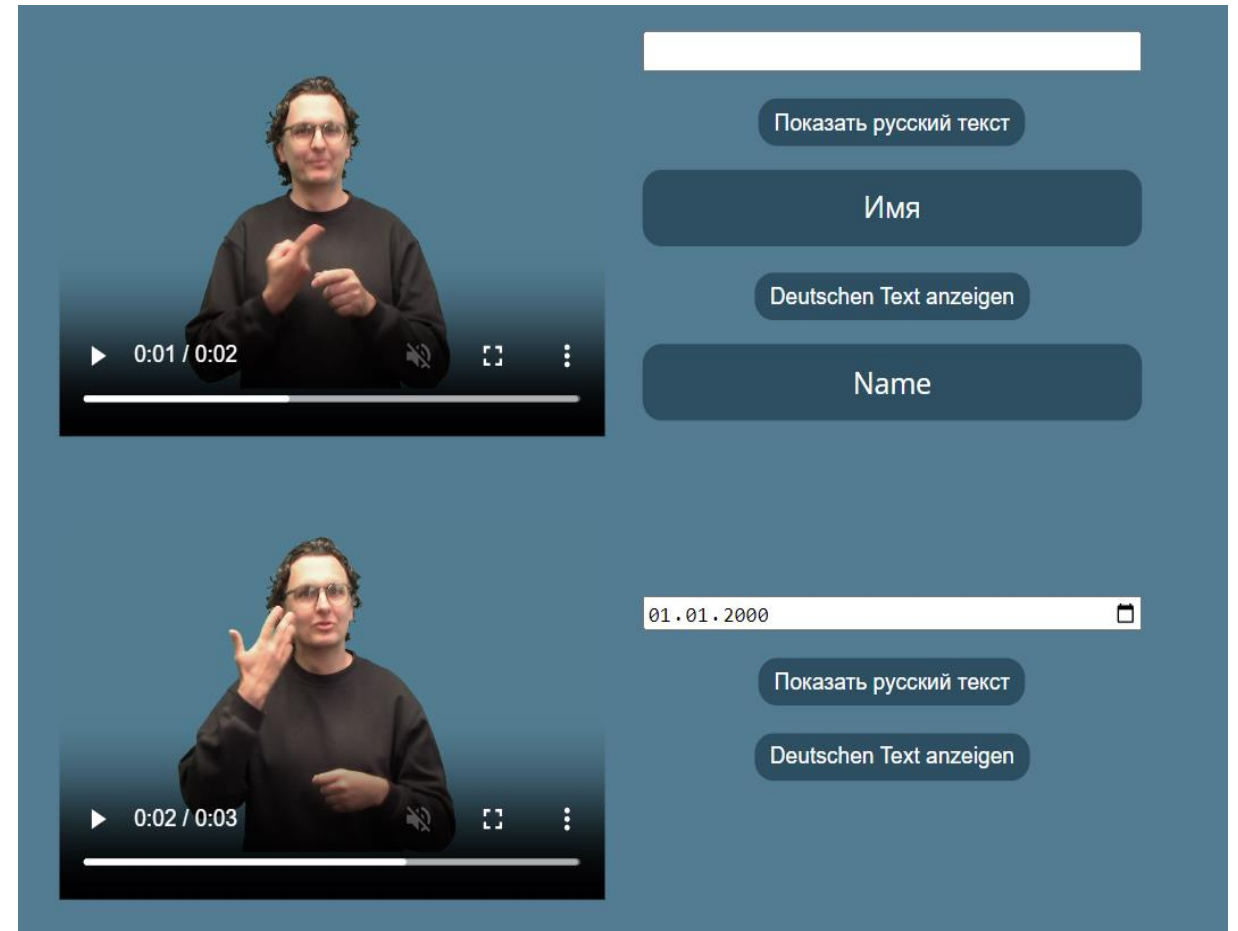


Fig. 2 — name & date-of-birth · top: text expanded; bottom: collapsed (default view)

Family hearing status & language repertoire

HeLEx asks about parents' language background — but not their hearing status.

Parental hearing status (and language repertoire) shapes age of onset, native vs. L2 input, and regional variants — and matters even more for heritage signers, where the family is often the primary language source.

Deaf

Hard of hearing

Hearing

CODA

Child Of Deaf Adult(s)

HeSLEx records each parent / caregiver separately, plus the participant's own self-identity (recorded as identity, not objective hearing status — the two don't always overlap).

Mayberry & Kluender (2018) · See also Crasborn & Hanke (2003) on metadata for sign language corpora.

Education & Deaf-specific contexts

Education as a sociolinguistic predictor

Type of school (oralist / bilingual / sign-medium) shapes proficiency.

Specific deaf school shapes dialectal preferences (Quinn 2010; Stamp et al. 2014).

Migration adds another layer — heritage signers may have attended multiple deaf schools with different language policies.

HeSLEx records language(s) of instruction at each level: primary, secondary, vocational, university — multi-select for bilingual education.

ADDED INTERACTIONAL CONTEXTS

*On top of HeLEx's **home / family / work / leisure / community**, we add:*

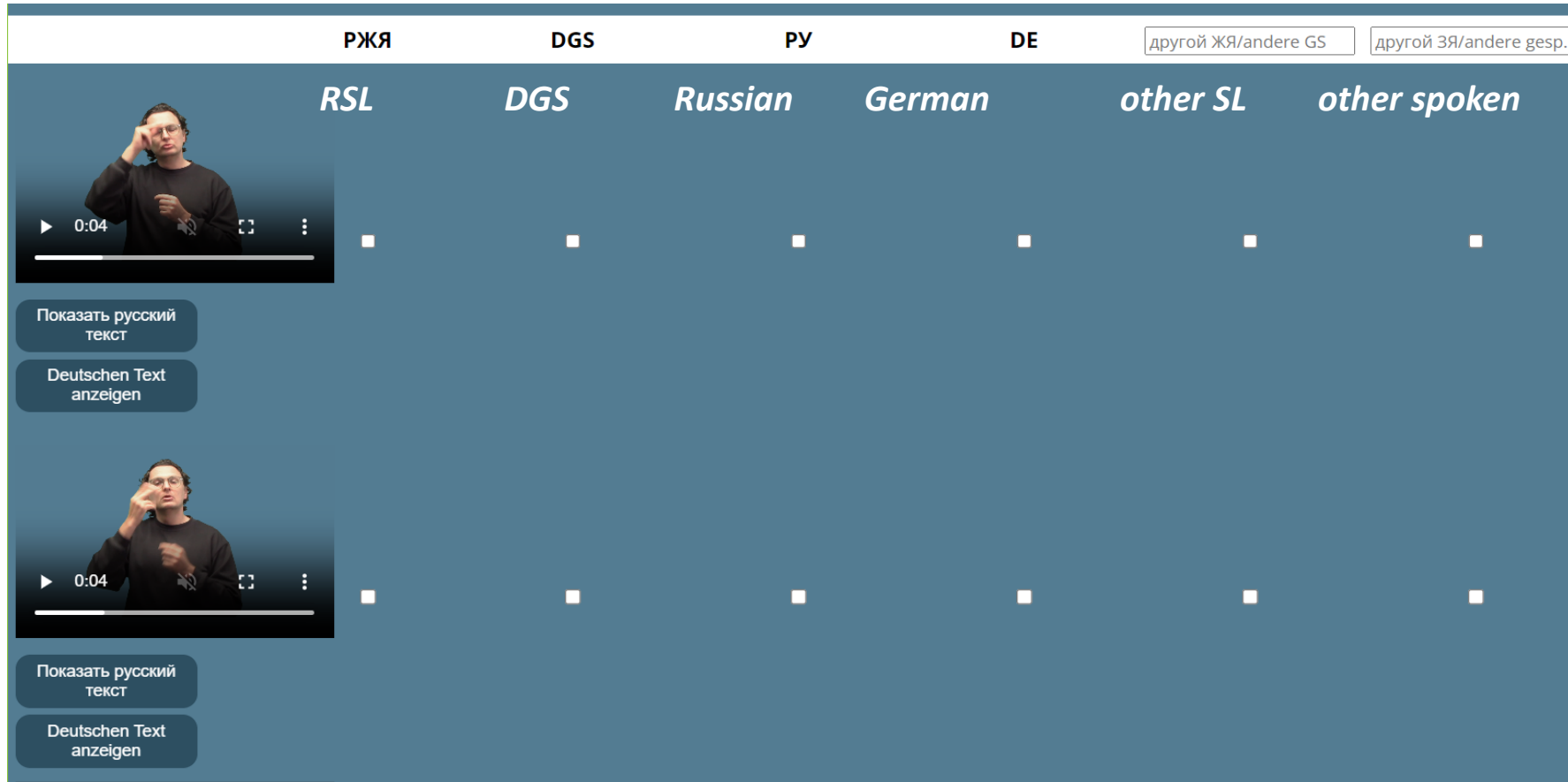
Deaf clubs / meeting centres

the epicentre of social life, especially for migrant Deaf communities — often the main place to use heritage RSL outside the family.

Social media

younger heritage signers consume signed content in many sign languages and International Sign on social platforms.

Education levels — language of instruction



HOW IT WORKS

- Columns: РЖЯ (RSL), DGS, РУ (RU), DE — plus free-text "other"
- One row per education level (primary / secondary / vocational / university)
- Multiple selections allowed → captures bilingual education

Fig. 3 — language used across education levels

Deaf-centred identity & attitudes

Identity, not objective hearing status — the two don't always overlap, yet both matter for language use.

INTERSECTIONALITY

Perceived societal attitudes conflate two different prejudices:

Toward a minority language

...shared with hearing heritage speakers (e.g. Russian in Germany).

Toward a sign language

...specific to Deaf communities. DGS signers may be more sympathetic to RSL signers (shared deafness experience), but governmental support for heritage RSL services may be lower than for heritage Russian.

Modality-appropriate proficiency & slider scales

Modality-appropriate measures

Speaking → Signing, Listening → Comprehension.

Sign and comprehension are recorded **separately** — heritage signers' comprehension is often well ahead of production. Reading and writing are kept for the spoken languages (RU / DE).

Slider scales instead of multiple choice

Continuous → informative for descriptive summaries and inferential models like LMER (Schütze & Sprouse, 2013).

Visual → less text on screen — better suited to a sign language survey.

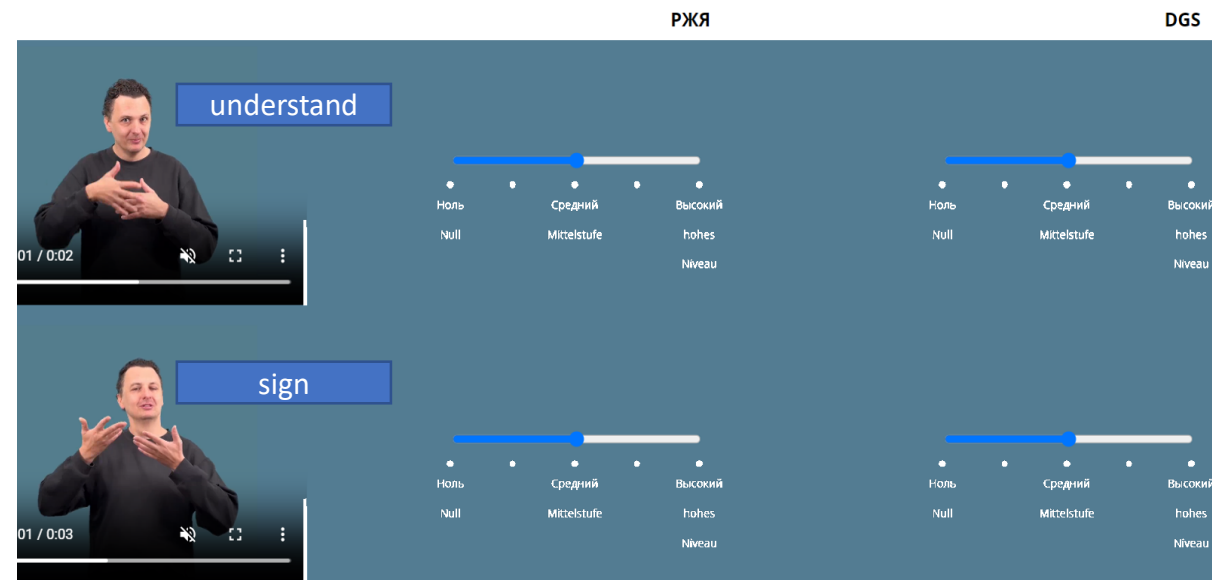


Fig. 4 — self-rated comprehension (top) and signing (bottom) in RSL and DGS · slider can land between ticks

SCALE GLOSSES

Ноль / Null = none

Средний / Mittelstufe = intermediate

Высокий / hohes Niveau = high

What we learned from piloting

3

Deaf participants
(1 on-site, 2 online)

WHAT WORKED

- RSL videos were clear; no participant needed the written texts during the test, except briefly for the consent form (most technical signs).
- Layout was visually legible and well-aligned with Deaf bilingual users' needs.
- Sliders used in a graded way — between ticks, not just on them.
- Data uploaded successfully across devices and browsers (caveat: phone loses partial data on close).

1

Reported issue - smartphone layout
broke (will be fixed)

WHAT WE CHANGED

- Larger / bolder slider tick labels.
- Built a "Back" button — required replacing the fixed jsPsychSurveyHtmlForm sequence with a controller that saves and restores state.
- Added German labels for all dropdown options (previously only Russian, per reviewer feedback).
- Default "... " option in dropdowns to disambiguate "skipped" from "first option chosen".
- Tracking whether the slider was actually moved (still imperfect, but disambiguates better).

Planned development

01

Video responses

Replace typed answers (occupation, name) with signed responses recorded via webcam.

Current jsPsychExtensionRecordVideo:

no HTML customisation, no preview, blind recording — unsuitable.

Goal: a custom extension that allows webcam preview + pre-record review.

02

Reusable jsPsych plugin

Currently videos and translations are hard-coded into each trial.

Goal: a dedicated HeSLEx plugin where researchers supply video files + translation texts and pick a response format — no JavaScript needed.

Reusable for any sign language dyad — including CODA studies and beyond.

● TAKE-HOME

HeSLEx

a visual-first, jsPsych-based sociolinguistic survey for heritage signing communities.

- Adapted from HeLEx, redesigned for Deaf bilingual users
- Tailored to RSL ↔ DGS in Germany — adaptable to other sign-language dyads
- Pilot-tested · iterating with reviewer + community feedback

TRY THE OFFLINE DEMO

<https://osf.io/jgdxv/>



SCAN TO OPEN

OSF materials

osf.io/jgdxv

References (selected)

- Benmamoun, E., Montrul, S. & Polinsky, M. 2013. Heritage languages and their speakers. *Theoretical Linguistics* 39(3-4).
- Bross, F. 2020. Object marking in DGS. *Glossa* 5(1).
- Crasborn, O. & Hanke, T. 2003. Metadata for sign language corpora. ECHO workshop.
- de Leeuw, J. R. 2015. jsPsych: A JavaScript library for browser-based behavioral experiments. *Behavior Research Methods* 47(1).
- Fridman, C. & Özsoy, O. 2024. Sentiments towards heritage languages and their speakers. *Heritage Language Journal* 21(1).
- Genesee, F. 2022. The monolingual bias: A critical analysis. *Journal of Immersion and Content-Based Language Education* 10(2).
- Gullifer, J. W. & Titone, D. 2020. Language entropy. *Bilingualism: Language and Cognition* 23.
- Laleko, O. & Polinsky, M. 2017. Silence is difficult. *Zeitschrift für Sprachwissenschaft* 36(1).
- Mayberry, R. I. & Kluender, R. 2018. Rethinking the critical period for language. *Bilingualism: Language and Cognition* 21(5).
- Montrul, S. & Polinsky, M. (eds.) 2021. *The Cambridge Handbook of Heritage Languages and Linguistics*. CUP.
- Morford, J. P. et al. 2011. When deaf signers read English. *Cognition* 118(2).
- Pichler, D. C., Lillo-Martin, D. & Palmer, J. L. 2018. A short introduction to heritage signers. *Sign Language Studies* 18(3).
- Polinsky, M. 2018. *Heritage Languages and Their Speakers*. CUP.
- Polinsky, M. & Scontras, G. 2020. Understanding heritage languages. *BLC* 23(1).
- Quinn, G. 2010. Schoolization ... BSL. *Sign Language Studies* 10(4).
- Schütze, C. T. & Sprouse, J. 2013. Judgment data. In *Research Methods in Linguistics*. CUP.
- Stamp, R. et al. 2014. Lexical variation and change in BSL. *PLOS ONE* 9(4).
- Tomić, A., Rodina, Y., Bayram, F. & De Cat, C. 2023. Documenting heritage language experience using questionnaires. *Frontiers in Psychology* 14:1131374.