Psychолinguistic norms for more than 300 lexical manual signs in German Sign Language (DGS)

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Introduction

Like verbal (i.e. spoken and written) language, studies of sign language processing with deaf and hearing signers have confirmed the influence of lexical variables on task performance [1,2].

This has led to the creation of normed stimulus sets for a number of sign languages which have derived lexical variables from subjective ratings of participants [3,4], primarily due to a lack of corpus data.

Here, we present a set of **psycholinguistic norms** for:

- **frequency**,
- **age of acquisition** (AoA),
- **iconicity**, and
- **transparency**

rated by: deaf signers, hearing non-signers

for **more than 300 lexical manual signs in German Sign Language (DGS)**.

Beyond our norming data, the dataset includes German and English correspondences of signs and annotations of lexico-semantic and phonological properties. Moreover, the set also includes quantitative data from automated motion-tracking derived using OpenPose [5], analyzed with OpenPoseR [6].

Methods

Participants

- 32 deaf singers (18 female, 14 male; mean age = 40.50 years, SD = 12.39 years).
- 30 hearing non-signers (15 female, 14 male, 1 other; mean age = 26.03 years, SD = 4.83 years).

Materials

- Initial set of 500+ signs, primarily drawn from [3,4] and amended with signs considered common by the authors.
- Excluding numbers, proper names, classifiers, compounds and signs based on the manual alphabet.
- Final set of 310 lexical manual DGS signs (including spontaneous mouthings and lexical non-manuals [7]). These were signed by a deaf co-author who is a native DGS signer (JMC).

Procedure

To ensure good data quality [8], data was collected on site in Leipzig, Göttingen, and Hamburg (deaf signers) as well as in Leipzig only (hearing non-signers).

1

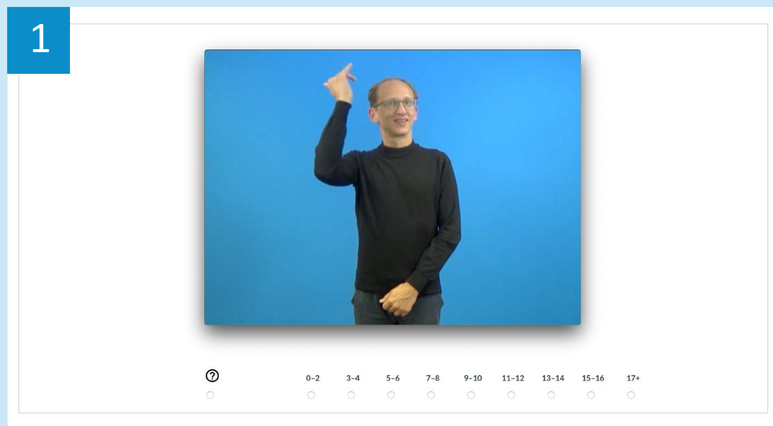

Figure 1: Example screenshots of tasks. Top: AoA task for signers. Bottom: transparency task for non-singers.

Results

2

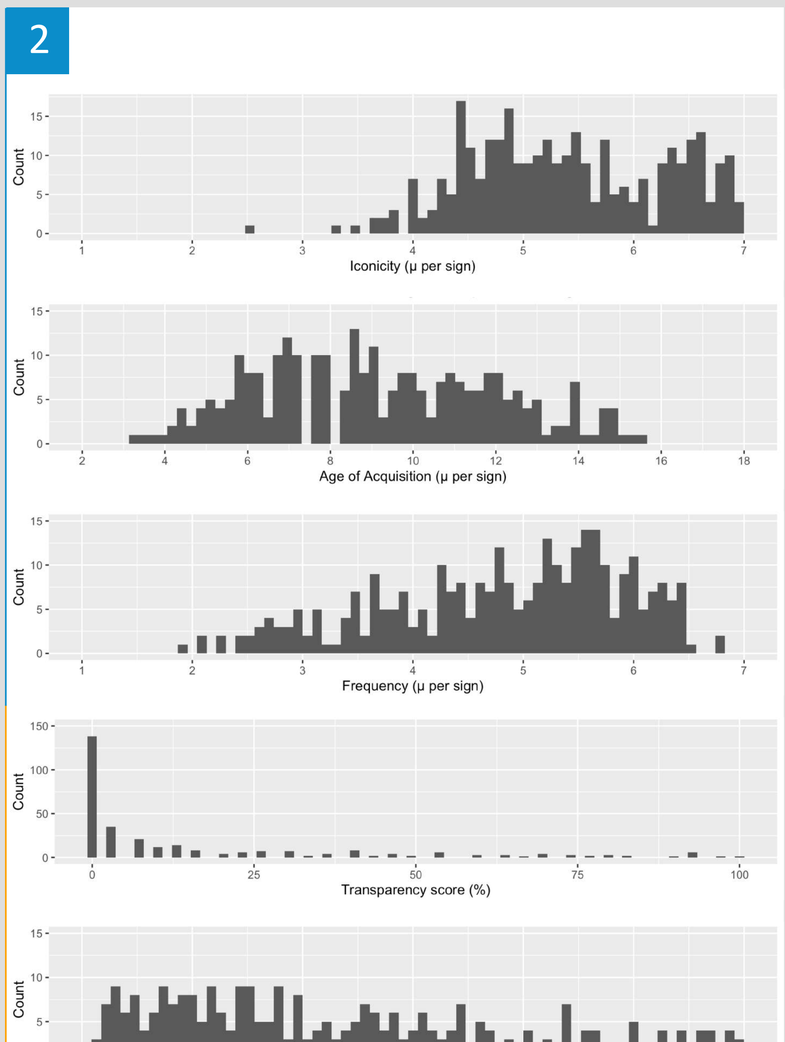

Figure 2: Frequency histograms showing the distribution of mean subjective ratings for all of the 310 DGS signs normed in the present study.

3

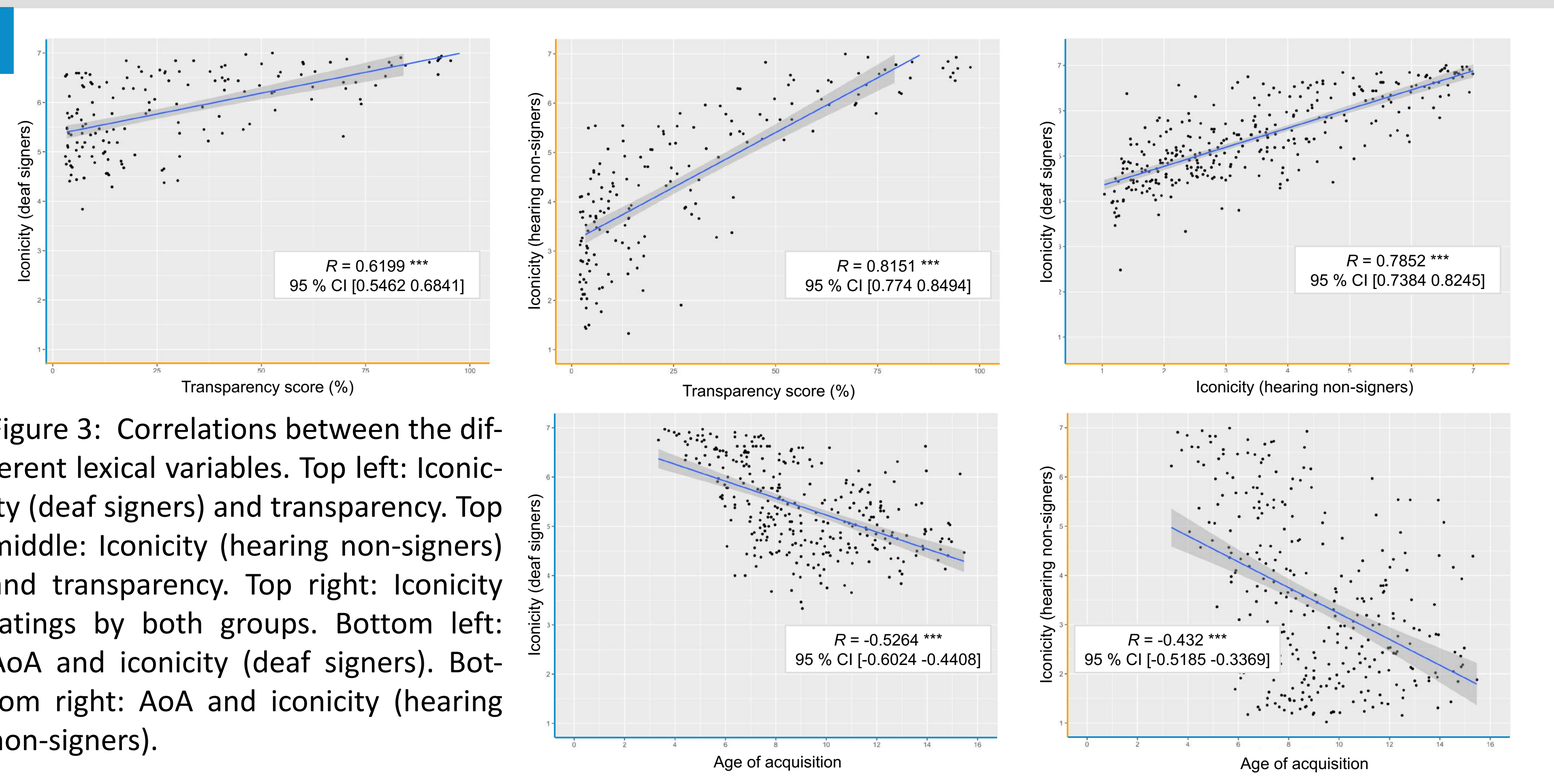

Figure 3: Correlations between the different lexical variables. Top left: Iconicity (deaf signers) and transparency. Top middle: Iconicity (hearing non-signers) and transparency. Top right: Iconicity ratings by both groups. Bottom left: AoA and iconicity (deaf signers). Bottom right: AoA and iconicity (hearing non-signers).

4

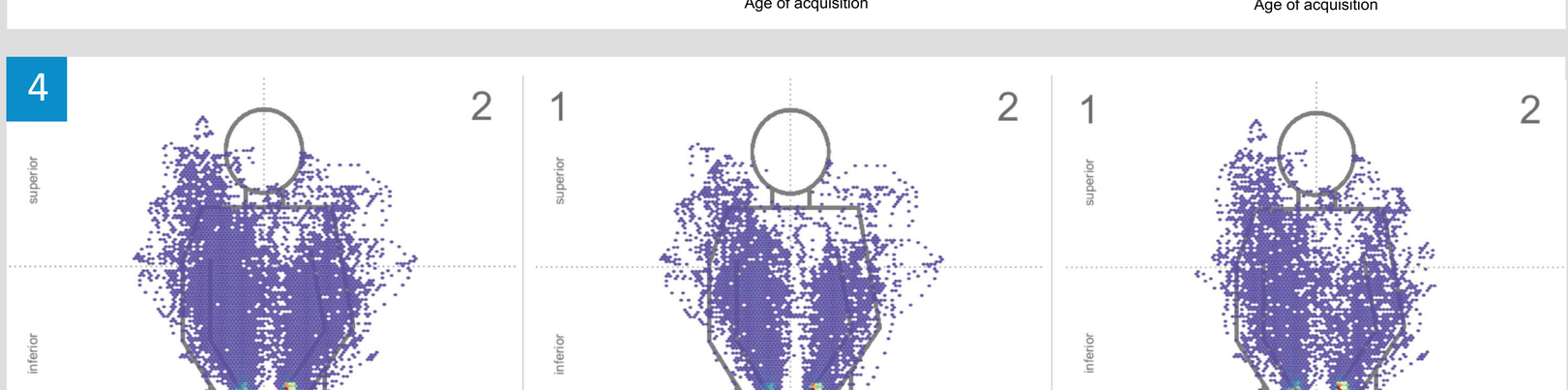

Figure 4: Motion-tracking data. All signs in set (left). No difference for frequent (middle) and infrequent (right) signs.

Discussion

- Deaf signers tend to consider DGS to be very iconic, whereas hearing non-signers tend to regard signs as less iconic on average.
- Despite these group differences with regard to the subjective awareness of iconicity, iconicity ratings by both groups were highly correlated.
- Also, iconicity ratings by deaf signers and hearing non-signers were both significantly correlated with transparency scores.
- Lastly, AoA was negatively correlated with iconicity ratings by both groups.

We make these norms publicly available through the Open Science Framework in the hope that they may prove be useful to other researchers.

References

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Data availability

Our norms and all stimulus video clips, the raw data, and R scripts used for analysis are publicly available for download on the Open Science Framework.

OSF

Project page: https://osf.io/mz8j4/

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