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# Where Methods Meet: Combining Corpus Data and Elicitation in Sign Language Research

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## Abstract

We discuss three case studies on various grammatical phenomena in Russian Sign Language (RSL) and Sign Language of the Netherlands (NGT) in order to compare corpus-based and elicitation-based approaches to sign linguistics. Firstly, we investigate impersonal reference in RSL using corpus search, informal elicitation, and an acceptability judgment task. Secondly, we examine argument structure and pro-drop licensing in NGT psych verb constructions using corpus search and a supplementary acceptability judgment task. Thirdly, we investigate conditional clauses in NGT based on corpus search, and contrast the findings with those from elicitation-based studies of conditional clauses in other sign languages. The three case studies highlight both the merits and limitations of combining different research methods as well as illustrate some of the issues that arise from doing so – and how they may be navigated. We conclude that corpus-based research serves to identify the boundaries of observed variation and describe both expected and unexpected patterns, while the underlying factors for these patterns can be investigated by eliciting data in more controlled contexts. Finally, we demonstrate that the differences in the results obtained via various research methods have important practical implications, in particular for sign language education.

**Keywords:** corpus research, elicitation, methodology, sign language

## 1. Introduction

The growing number of corpora of sign languages and the concomitant increase in corpus-based research in sign linguistics (Efthimiou et al., 2016) have made it important to evaluate corpus methods and compare them to other methods, specifically, elicitation.

For spoken languages, the advantages and disadvantages of corpus-based methods in comparison to elicitation have been described. Corpus data is more natural; it contains contexts; it shows a greater amount of variation. On the other hand, corpora by definition cannot provide negative data (if something is not attested in a corpus, it does not mean that it is ungrammatical), and some of the variation in the corpus might be due to performance errors (Hoffmann, 2006; Gilguin & Gries, 2009). It has therefore been suggested that combining the methods is a way to overcome the disadvantages of both (ibid).

However, for sign languages, no systematic methodological research to compare the various methods has been done so far. As a first step toward filling this gap, this paper discusses such methodological issues based on three case studies in two sign languages: Russian Sign Language (RSL) and Sign Language of the Netherlands (*Nederlandse Gebarentaal*, NGT).

In sections 2-4 we describe the case studies, and we summarize in section 5 how the different methodologies compare to and complement each other. Finally, we discuss the practical implications of the studies – in particular for sign language education – in section 6.

## 2. Case Study 1: impersonals in RSL

Many spoken languages have specialized impersonal pronouns that are used for impersonal reference (referring to humans but not specifying the referent exactly), such as *one* in English and *man* in German (Gast & Van der Auwera, 2013). We investigated how impersonal reference is expressed in RSL using a combination of

corpus search, informal elicitation, and acceptability judgments (Kimmelman, in press).

Impersonal pronouns can be used in a variety of contexts, such as in existential contexts (*Someone has stolen my car*), universal contexts (*They eat snails in France*), and conditionals (*If you drink, you should not drive*). Furthermore, a language can use dedicated impersonal pronouns, such as *one*, but also use personal pronouns with impersonal reference, such as *you* and *they*. We aimed to find out which strategies (e.g., pronouns) are used in RSL and in which contexts they can be used.

### 2.1 Corpus Study

For the initial investigation, we used the RSL corpus (<http://rsl.nstu.ru/>) (Burkova, 2015). The corpus contains recordings of 43 signers of RSL from different regions; the data mainly consists of narratives (spontaneous or cartoon retellings), and some dialogues. The corpus has been glossed (separate tiers for the right and left hands), and sentence translations are also present. Since no special annotation for impersonal reference was provided, we searched for impersonal contexts indirectly. Specifically, we searched for the Russian words *kto-to* ‘someone’ and *kto* ‘who’, plural marking on verbs, and second person pronouns and verb forms as they can all be used in impersonal contexts in Russian.

It turned out that some constructions for impersonal reference could indeed be identified in the corpus. For instance, pro-drop (1a) and the indefinite pronoun SOMEONE (1b) can be used in impersonal contexts.

- (1) a. BUS COME / SPEAK NUMBER [\[video\]](#)  
‘The bus came and they announced its number.’
- b. SOMEONE PORTER MAYBE THROW.OUT [\[video\]](#)  
‘Someone – maybe a porter – threw him out.’

However, the severe size limitations of the RSL corpus – the total number of signs in the corpus as estimated by the number of glosses on the right hand is 25 000 – prohibited

us from investigating all possible contexts and all strategies used for impersonal reference.

## 2.2 Informal Elicitation

To amend this, we also used informal elicitation, that is, a translation task with four native signers of RSL. We used a questionnaire from Barberà & Cabredo Hofherr (in press) which includes all typical impersonal contexts. The signers were presented with a context implying impersonal reference and were asked to translate a sentence that could be used in this context.

Using this method, we found a variety of means to express impersonal reference in RSL. Pro-drop is used in all impersonal contexts; the pronoun SOMEONE is used in existential impersonal contexts and in conditionals. In addition, we found that the plural pronoun IX-PL can be used by some signers in universal impersonal contexts (2).

- (2) IX-PL SAY IX-A DRINK A.LOT  
'They say he drinks a lot.'

So far, using corpus data and elicitation tasks turned out to deliver partially overlapping results (the use of pro-drop and SOMEONE was found in both types of data) and partially complementary results (some of the contexts and the use of IX-PL were only found through elicitation). However, on one issue, the corpus and elicitation delivered partially contradicting results. We wondered whether the second person pronoun IX-2 could be used impersonally in RSL. While corpus data provided some such examples (3) [video], the four signers unanimously claimed that this pronoun only had a personal reading. Surprisingly, two of them spontaneously produced an impersonal sentence with this pronoun before they were asked about it explicitly.

- (3) ORDER IF SMOKE FUT IGNORE, IX-2 FINE 1500-3000  
'If you smoke, you will be fined 1500-3000 rubles.'

## 2.3 Acceptability Judgment Task

In order to further investigate the latter issue, we conducted an experimental acceptability judgment task in which 16 RSL signers were asked to rate a variety of signed RSL sentences in context on a 5-point scale. We created stimuli in which the IX-2 pronoun could only be interpreted as impersonal (e.g. *You should not smoke if you are pregnant* explained to a man). Judgments showed a great deal of variation in their judgment, but participants generally did not consider the impersonal use of this pronoun ungrammatical.

## 2.4 Discussion

How can we explain the conflicting results of the corpus search, informal elicitation, and formal experimentation? We suspect that the variation can be attributed to borrowing of the impersonal use of the second person pronoun from (spoken/written) Russian. While signers use this pronoun impersonally (perhaps as a form of code-switching to Signed Russian) and are not opposed to it in a judgment task, they consider this construction to be too much Russian-like when asked about it directly.

This case study thus shows several things. Firstly, corpora are limited – and sign language corpora are especially small. Therefore, many grammatical phenomena cannot be studied in detail using corpus data alone. Secondly, combining corpus and elicitation data is often productive.

Thirdly, it is possible that corpus data and (informal) elicitation will produce conflicting results, which reflects the previously attested tendency of signers/speakers to be stricter in judgments than in actual use (Labov, 1975), which emphasizes the importance of using corpus data to get a realistic view of variation.

In connection to the latter point, sign language data presents an additional problem due to the possibility of code-switching and general interaction with spoken languages/manual systems. It is clear that instances of code-switching and borrowing are present in corpus data (Bank, 2015), but signers aware of the differences between sign language proper and a manual system are likely to reject constructions which resemble those used in the spoken language. However, these direct judgments might not reflect the actual use of native signers and they do not necessarily distinguish code-switching from borrowing. Again, it is therefore useful to combine corpus data with elicitation.

## 3. Case Study 2: Psych-Verbs in NGT

In a study of the argument structure of NGT psych-verbs – verbs denoting a psychological state or the bringing about of a change in a psychological state (Levin, 1993) – a combination of corpus data (3.1) and acceptability judgments (3.2) were analyzed (Oomen, 2017). Challenges that arose as a result of combining the two methods are discussed in 3.3.

### 3.1 Corpus Study

We analyzed 309 annotated dialogues from the Corpus NGT (Crasborn et al., 2008), 181 clauses containing 37 distinct psych-verb forms were identified with the use of search terms. Analysis of these clauses revealed the following patterns:

- All lexical forms of psych-verbs except two are iconically body-anchored, i.e., they iconically refer to an aspect of the internal experience or external expression of a psychological state;
- Most psych-verbs, such as ANGRY, SAD, and WORRY, typically select just an Experiencer argument, with a Theme argument occurring only occasionally (29/159 examples); they are labeled type-A verbs. Three lexical forms (LOVE, HATE, MISS), labeled type-B verbs, require both an Experiencer and a Theme;
- The Experiencer occurs in subject position, while the Theme, if present, occurs in object position. Object Experiencer constructions were not attested, although two seemingly idiomatic periphrastic constructions with MAKE and a psych-verb were found;
- The Experiencer can be left non-overt, but apparently under the condition that its referent is first person: 17 such examples occurred (4a), as opposed to just one example with a non-overt non-first person referent;
- The restriction for non-first person referents does not hold when role shift markers are present: 27 examples with role shift and non-overt non-first person subject Experiencers (4b) were attested;
- The auxiliary glossed as AUX-OP (Bos, 1994), which agrees with subject and object through path movement modification, can co-occur both with type-A and type-B psych-verbs, although only two such examples were found for both types.

- (4) a. ANGRY  
 'I am angry.'
- b. MOTHER COME / ANGRY<sub>rs</sub>  
 'My mother came. She was angry.'

Without going into detail, we integrate the findings into a theoretical account by proposing that iconically-motivated body-anchoring of psych-verbs triggers an association with first person, which (i) forces the Experiencer in subject position, and (ii) leads to a default first person interpretation of the Experiencer in the case of a non-overt argument. For further details, see Oomen (2017).

The theoretical analysis can only be read as a set of hypotheses, since the (un)grammaticality of constructions that are not attested in the corpus data cannot be proven on the basis of corpus data alone. We designed a small acceptability judgment task to surmount this problem.

### 3.2 Acceptability Judgment Task

With the acceptability judgment task, in which three native deaf signers of NGT participated, we aimed to test the following three hypotheses:

- I. A Theme argument can be added to psych-verbs that typically select just an Experiencer (type A).
- II. The directional auxiliary AUX-OP can co-occur with type-A psych-verbs, despite the fact that these verbs preferentially occur with just one argument.
- III. A periphrastic object Experiencer construction with MAKE and a psych-verb is grammatical in NGT.

Testing a fourth prediction, namely that a subject Experiencer can only be dropped when it is a first-person argument, turned out to be infeasible (see 3.3 for details).

The hypotheses were tested with 11 sentence pairs that consisted of a scene-setting sentence introducing the relevant referents and a target sentence, recorded with a native signer of NGT. Examples of target sentences with intended translations for the respective hypotheses are given in (5). Note that (5b) actually includes two target sentences, which differ in the directionality of AUX-OP (as indicated by the subscripts). Both were included to verify that the auxiliary successively picks out the Experiencer and Theme – which would be the expected order if these thematic roles map onto subject and object, respectively.

- (5) a. INDEX<sub>1</sub> INDEX<sub>3</sub> ANGRY  
 'I am angry with him.'
- b. INDEX<sub>3a</sub> AFRAID<sub>3a/b</sub> AUX-OP<sub>3b/a</sub>  
 'She<sub>3a</sub> is afraid of it<sub>3b</sub>.'
- c. ACCIDENT INDEX<sub>1</sub> SAD MAKE  
 'The accident made me sad.'

Three signers were shown each of the sentence pairs in random order and were asked to make an acceptability judgment for each target sentence. In case of rejection of the sentence, they were asked to explain their choice and to provide an alternative.

The results were variable but largely confirmed expectations. Two signers judged sentences with type-A psych-verbs and two arguments (5a) grammatical while

one signer did not, offering instead that the Theme argument be dropped or replaced by AUX-OP. In line with expectations, signers uniformly agreed that sentences including AUX-OP and a type-A psych-verb with an Experiencer-to-Theme trajectory are grammatical. Finally, sentences such as (5c) were rejected by two signers, but accepted by a third signer. All three signers offered a construction with a subject Experiencer and a psych-verb (e.g. INDEX<sub>1</sub> SAD) as an alternative.

### 3.3 Challenges

The results that emerged from the two data types – although similar – did not fully converge, which was mostly due to the variability in judgments in the experimental task. Admittedly, the number of participants was small, but this does not pre-empt the question how such variation should be interpreted. A larger pool of participants would not necessarily lead to an elimination of variation; many factors – both participant-related and task-related – make acceptability judgments “noisy, volatile, less objective, and less generalizable than previously assumed”, as Gilquin and Gries (2009:3) point out. Acknowledging this is important when interpreting the results from a judgment task. For instance, the signer who rejected sentences with type-A psych-verbs and two arguments mentioned at a certain point that the stimulus or cause of an emotion (i.e. the Theme argument) is hardly ever relevant or important. We do not know whether this statement reflects a personal opinion, an attribute of NGT psych-constructions, or an artifact of the sentence pairs in that they somehow relegate the Theme argument to this status. Whatever the reason, it might have affected how she (and the other participants) judged the sentences, with conflicting results as a consequence. Nonetheless, the combination of corpus data – in which 29 examples with a type-A verb and two arguments were found – and elicited data makes a much stronger case for the grammaticality of such constructions.

Similarly, one signer accepted the periphrastic constructions with MAKE, while the other two signers unequivocally rejected them. The judgment of the first signer might be influenced by Dutch, which does allow such constructions – but one can think of a myriad of other explanations for the differences in judgments. Yet, again, while the construction has not been proven to be ungrammatical, the results from the corpus data – which only contained two such constructions – and the judgment task combined provide more convincing support that the construction must at least be very marked.

Thus, both these examples illustrate how combining corpus and experimental methods can facilitate the interpretation of results, even if they show subtle differences.

Analysis of the corpus data revealed an intricate interaction between use of role shift, grammatical person and overtness of the subject Experiencer in NGT sentences with body-anchored psych-verbs. Of the eight (2x2x2) possible combinations of values for each of these factors, one – constructions with a non-overt non-first person Experiencer without role shift – was basically unattested, which gives rise to the suspicion that it might be ungrammatical.



Confirmation from experimental data would be welcome. However, due to the number and nature of the variables involved, a dauntingly elaborate experimental set-up would be required. In order to properly test the interaction between each of the three factors in an acceptability judgment task, for instance, eight conditions would need to be included. Moreover, both subject drop and role shift are (far) more natural in longer stretches of discourse, which creates the need to design relatively long examples in order to avoid negative judgments for unintended reasons. This issue adds a significant extra layer of complexity to the matter.

Thus, the grammaticality of sentences with the described combination of factors is not easily refuted, which has implications for the way a theoretical analysis should be presented. On the other hand, precisely because of the number and nature of the variables involved, it seems plausible that the described pattern would not have been discovered had only controlled elicited data been used – which once again shows the merits of corpus research.

#### 4. Case Study 3: Conditionals in NGT

Our third topic concerns an extensive corpus study into conditional clauses in Sign Language of the Netherlands (Klomp, in press). We compare our results to those from studies on conditionals in other sign languages, which have primarily been obtained through elicitation tasks.

##### 4.1 Neutral and Counterfactual Conditionals

A typical example of a conditional clause in English is shown in (6) (in italics):

(6) *If it keeps on snowing*, I'll take the tram.

The first clause is called the conditional clause or antecedent and the second clause the main clause or consequent. From studies based on spoken languages, we know that some languages make a formal distinction between neutral conditionals (6) and counterfactual conditionals (7) (Dancygier, 1998):

(7) *If it had been snowing*, I would have taken the tram.

In (7), it is clear that the speaker knows that it did not snow; therefore, this type of conditional is called counterfactual. Dachkovsky (2008) observed that Israeli Sign Language (ISL) marks these two types differently non-manually. She found that neutral conditionals are marked by wide eyes, whereas counterfactual conditionals are marked by squinted eyes.

##### 4.2 Conditionals in Sign Languages

Although research on conditionals in sign languages is limited, three general patterns have been described for all studied sign languages (e.g., Liddell (1986) on American Sign Language; Dachkovsky (2008) on ISL). Firstly, conditionals can be introduced by an (optional) manual marker, i.e., an *if*-conjunction. Secondly, conditionals are accompanied by raised eyebrows, and sometimes also by other non-manual markers. Thirdly, the antecedent precedes the consequent. On the basis of this, one might conclude that the similarities between sign languages are strikingly strong; however, it is important to note that almost all previous research on conditionals is based on elicited data.

#### 4.3 Aim and Data of Current Case Study

The study aimed to describe conditional clauses in NGT and to make cross-linguistic comparisons. Furthermore, we were interested whether NGT marks neutral and counterfactual conditionals differently. Our data was extracted from the Corpus NGT (Crasborn et al., 2008) and consists of 407 CCs: 357 with a manual and (often) non-manual conditional marker and 50 with only non-manual marking. The former were found by searching on the gloss tier in ELAN, using the keywords IF (*als*) and SUPPOSE (*stel*). The latter were identified by searching for the Dutch conjunction 'if' (*als*) on the translation tier. The conditionals represent 51 signers from various regions in the Netherlands (age: 17-84).

#### 4.4 Results

The data reveals that also in NGT, the antecedent precedes the consequent, and the antecedent can be marked both manually and non-manually. However, we observed considerable variation in this marking. Firstly, seven different signs were found that can function as an (optional) *if*-conjunction. Secondly, we found striking variation in the position of the eyebrows, indicating raised eyebrows are not an obligatory marker for conditionals in NGT at all times. Figure 1 shows that only a minority of the conditionals with a manual marker and a relatively small majority of conditionals without manual marker are accompanied by raised eyebrows. The difference between these two groups of sentences is significant: the eyebrows were less frequently raised (instead of furrowed or neutral) in sentences with manual marker (odds ratio = 0.34,  $p = 0.01$ ,  $z = 2.46$ , 95% confidence intervals from 0.13 to 0.76).

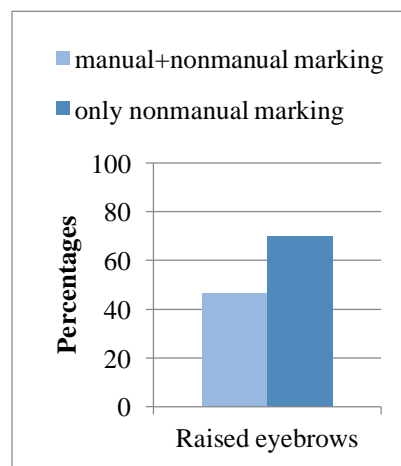


Figure 1: The percentages of conditionals with and without manual marker in which the eyebrows are raised.

Thirdly, we found that the use of other non-manuals, specifically the position of the head, varied as well. Neither this amount of variation in manual and non-manual marking, nor the optionality of raised brows when there is a manual marker has been described for conditionals in other sign languages. This raises the question if NGT conditionals are marked fundamentally differently from other sign languages, or if the different results are (partly) due to the different methodologies. Finally, we found few clear cases of counterfactual conditionals, suggesting that a different approach is needed to describe this category.

## 4.5 Discussion

Some of the variation that we found – particularly the variation in manual markers – can be explained by regional differences (Schermer, 2004). However, the amount of variation found in this study should likely be attributed to the methodology: it is based on more data from more signers from different regions, of more diverse ages and (language) backgrounds, than previous studies on conditionals in other sign languages. As we also described for the other case studies, this has advantages: we base our results on natural discourse and include many language users from different backgrounds. The disadvantages, on the other hand, are also clear: corpus data is not suitable for every aim (e.g., describing counterfactual conditionals) and results may be affected by independent factors (e.g., signers' background, context of the discourse), which we need to disentangle to interpret correctly (Hoffmann, 2006). Again, we conclude that elicited and corpus data complement each other.

## 5. Summary

The case studies we discussed show several clear examples of advantages and disadvantages of both corpus-based and elicitation-based methods in sign linguistics.

Two major limitations of corpus-based methods are the absence of negative evidence and size restrictions. The latter problem is unavoidable even with huge corpora of spoken languages, as some grammatical phenomena or lexical items might be too rare to be attested in even a very large corpus (Gilquin & Gries, 2009). However, for sign languages, this problem is even more drastic, as corpora of sign languages are relatively small. As such, even common phenomena, such as some impersonal constructions (case study 1) or counterfactual conditionals (case study 3), might be difficult to find.

There are also clear benefits of corpus-based methods in comparison to elicitation. A major advantage apparent in all three case studies is that corpus data better reflects the variation present in natural language use. However, as discussed in the third case study, the drawback is that the existing sign language corpora are not large or balanced enough to track the factors underlying this variation: we can observe the variation but not adequately explain it.

Another advantage of corpus data is the presence of extended contexts. Many phenomena, e.g., impersonals, pro-drop, and role shift, are only naturally used in longer stretches of discourse. Elicitation of constructed examples to describe such grammatical phenomena requires either the use of unnatural examples or longer test items, which makes elicitation tedious, as illustrated by case study 2.

A way to overcome the disadvantages of both elicitation and corpus-based methods is to combine the two (case studies 1 and 2) (Hoffmann, 2006). Thus, it is possible to identify the boundaries of the observed variation and describe both expected and unexpected patterns in the corpus – and then target the possible underlying factors by eliciting data in more controlled contexts.

Still, this is not a perfect solution, as corpus data and elicited data sometimes contradict each other (case study 1). We hypothesize that such contradiction often occurs

due to more “puristic” judgments that signers (or speakers) give as compared to their natural language use (Labov, 1975). While this can happen with any type of grammatical phenomenon, this issue seems to be especially acute in the case of constructions borrowed from or influenced by a spoken language. Signers aware of the distinction between the manually-coded spoken language and the “real” national sign language tend to give negative judgments to constructions which resemble the ones used in spoken language, even if they themselves produce such constructions in naturalistic signing (case study 1). Neither corpus data nor elicited data (nor their combination) helps us unambiguously distinguish instances of borrowing from instances of code-switching.

Despite the limitations, we conclude that combining corpus and elicitation techniques is a strategy worth pursuing. With the increased availability of sign language corpora, we expect to see more studies in the near future delving deeper into the issues touched upon in this paper.

## 6. Implications for Sign Language Education

Here, we address the practical implications of results from studies combining corpus and elicitation methods by considering how they may be employed in the education of second language learners of a sign language. Our focus is on the Netherlands, specifically the University of Applied Sciences Utrecht (*Hogeschool Utrecht*, HU), where students are educated to become NGT interpreters or teachers. Clearly, these students need to reach fluency in NGT at a high level: at least level B2 in the Common European Framework of References for (Sign) Languages is required (Leeson et al., 2016).

The teaching method at the HU is, as much as possible, evidence-based (Van den Bogaerde & Boers-Visker, 2011). When teaching content is based on descriptions of NGT that are obtained either through corpus research or elicited data, there is a similar dichotomy as mentioned earlier. If teachers rely solely on signers' intuitions and results from elicited data, the teaching content would probably not reflect the variation that we encounter in the language. Conrad (2004) claims that ignoring the variation can even weaken the effect of teaching materials. It may lead, for instance, to students not learning structures that are commonly used among native signers. A concrete example: the most frequently found manual conditional marker in case study 3 is not included in the teaching materials of the HU – probably due to the fact that it is a regional variant.

On the other hand, if the teaching content is only based on corpus data, the input might be too varied. It is not the objective of the course to teach students all possible variants and dialects of NGT, since native signers also do not master all varieties. Furthermore, overreliance on corpus data in teaching may create the risk of implementing ungrammatical structures in teaching materials (performance errors, Hoffmann, 2006). This is indeed a paradox: while the aim is for students to master a language at a high level by getting natural and varied input, they at the same time benefit from clear rules and restricted variation. In the words of Aijmer (2010: 2): “(...) teachers (and learners) look for simple answers to grammatical problems in terms of what is right and wrong

and shy away from the fuzzy picture of language as used in the corpus concordance.”

Since more and more sign language corpora are becoming publicly available, the issue discussed above has become more relevant. We suggest that also in teaching materials, there are clear benefits of combining results of corpus data and elicited data. When there are clear rules, these can be offered to the students – but the variation that a language presents are best not ignored. When there is no corpus of a particular sign language available, one can think of cooperating with native signers to provide students with varied and qualitative input that reflects the variation in the language. For the Netherlands, the latest teaching methods are already focused on offering ample input and letting the students (initially) detect the rules themselves (Van den Bogaerde & Boers-Visker, 2011). When many different signers provide this input, the variation will likely be included naturally. Furthermore, if sign language teachers are aware of the extent of variation in different linguistic phenomena, they can keep that in mind when providing feedback on a student’s language production. For linguists working with various methodologies, it is important that they are aware of the potential value of their results for language education and that they make an effort to make them accessible for language teachers.

## 7. Acknowledgements

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