# Methodological innovations in sign multilingualism research

Jenny Webster, Kang-Suk Byun, Sibaji Panda and
Tashi Bradford

This chapter focuses on methodological innovations in the MULTISIGN project, a three-part study that examined a range of complex multilingual behaviours in sign language users, including "cross-signing", "sign-speaking", and "sign-switching" (see Chapter 1). Two main innovative features are explored in this chapter: the post-hoc interviews in the cross-signing strand (1), and the elicitation materials and procedures used in all three strands (2), including cultural adaptations to the local environment. However, this does not encompass all of the innovations inherent in MULTISIGN, and some of these further aspects are covered in other chapters in this volume.

MULTISIGN was the first large-scale study in the field of sign multilingualism, and investigated behaviours that had never been empirically researched before. It therefore posed challenging methodological questions that required creative solutions and adjustments throughout the project cycle. This process of trial and error enabled the research team to develop a set of innovations that may aid further work in sign multilingualism and inform methodologies in other studies that examine incipient communication between people who do not have a shared language.

The methodological innovations explored here were necessary and beneficial for this project because a major aim was to apply extant techniques innovatively in novel contexts. This included adapting experiments in the field for use in local contexts (see section 2); using a "director-matcher" task with cross-signers who have no shared language; and exploiting "reverse fieldwork" for which participants came to the UK in 2012 and India in 2014 for a period of five to six weeks each time (cf. the "data collection fairs" for bimodal bilingual children in Quadros et al. 2015: 253–254). This gave rise to methodological and logistical challenges for the researchers and personal and intellectual challenges for the participants. After the initial video recordings between the cross-signing pairs (each pair being comprised of two signers who do not share a sign language), post-hoc interviews were carried out in which they commented on the interaction, and ultimately provided the team with interesting insights into their meta-linguistic reasoning and levels of comprehension (see section 1). To allow the participants to draw maximal benefit from their involvement in the study, the data collection

process ran in parallel with capacity building activities: in the UK, they partici-
pated in university events, received research training, and enjoyed external visits
to deaf organisations; in India, they took part in a bespoke two-week training
programme.

The methodological innovations also connect the three strands, as there are
serendipitous and strategic overlaps that permit the results to be triangulated
within, and compared more easily across, the three strands.

# 1 Post-hoc introspective interviews

This section focuses on methodological innovation stemming from a series of
post-hoc introspective interviews conducted under the cross-signing study.
These interviews resulted in a number of key discoveries regarding the types
of meta-linguistic reasoning that participants utilised when selecting com-
municative strategies (please see Chapters 2 and 4 for further details on the
cross-signing study).

First, it is useful to consider the wider empirical value of interviews as a
technique in linguistics research. This is a common method in sociolinguistics,
as it facilitates "structured conversation" that can target specific phenomena
(Hill 2015: 201). The use of interviews is dynamic because they can be conducted
in the signed language or visual-gestural system, which is often more acces-
sible to deaf participants compared to text-based interviews (e.g. open-ended
questions or Likert-scale items). Interviews can supplement other methods for
more robust datasets and corpora. Interviewing was one of four methods[1] used
to gather data in the British Sign Language Corpus Project (Fenlon, Schembri,
Johnston and Cormier 2015: 164). A deaf interviewer asked participants about
their language attitudes and awareness for 15 minutes, and the resulting data
became part of the BSL corpus. Small-group interviews are sometimes helpful
in generating a larger number of forms or signs in a particular target domain; for
example, Nyst (2015: 117) suggests that informants find it easier to think of many
lexical signs if they are interviewed in a group, and guided through various
semantic fields, e.g. animals, colours and food. However, interviews are not
only used to collect primary data in linguistic studies, but are also exploited as
ancillary data (Edley and Litosseliti 2010: 169). They can be useful for capturing
different views on one topic, i.e. providing "multivocality" (Litosseliti 2003: 18;
Edley and Litosseliti 2010: 170). Researchers have also relied on interviews to

---

**1** The others were spontaneous conversations, personal anecdotes, and elicitation using a word list.

query the extent of participants' comprehension, similar to the purpose of the interviews here. For example, Noble et al. (2014) interviewed language learners after a test to clarify what linguistic content they understood, what they found difficult, and how they tackled the test questions. The interview method was the only way to determine whether the students had trouble with two particular English discourse features that are common in tests (instructions requiring learners to choose the "best" answer, and refer back to the previous sentence). The researchers would not be able to glean this information by simply viewing their answers and scores. This way of using interviews may contribute to more thoughtful and empowered perspectives among the participants, perhaps enabling them to feel more ownership of the research and enjoy a greater benefit from their involvement, which is especially desirable when participants are from a traditionally disadvantaged minority group (Edley and Litosseliti 2010: 169–170).

Of course, it is worth keeping in mind that the interview method also carries risks and limitations, including the interviewer asking "leading" questions or being directive or influential over the responses; aiming for "neutrality" and "generalisability"; and failing to account appropriately for the specific discourse context or dynamics (Edley and Litosseliti 2010: 173–174). However, such risks are more problematic if the research takes place within a positivist framework, where there is assumed to be some objective truth that the scholar is aiming to uncover. The use of a constructionist framework, on the other hand, addresses these limitations by acknowledging that interviews generate indicative, illustrative, reconstituted data, instead of assuming that the data represents faithful reporting of authentic, objectively verifiable accounts (Edley and Litosseliti 2010: 173). For the present study, a constructionist perspective was adopted, as the post-hoc interviews were intended as a supplementary method to provide insight into the conversational data.

The conversational data were gathered by filming a corpus of 8–10 dyads at least three times each over 4–6 weeks, so that these recordings could then be analysed for linguistic patterns and communicative strategies. The conversational data collection, in contrast to the experimental data collection described in 2, targets the production and output side of the communication. Following the filming sessions, post-hoc introspective interviews were conducted with the participants to gain insight into the rationales behind their strategies and assess their level of mutual comprehension, as this cannot be determined from the recordings alone. These interviews were devised when a pilot study, conducted with a conversational dyad from Turkey and South Korea, showed that substantial misunderstandings often occur, most notably at the lexical level, without the participants being aware of it.

Such interviews formed a vital component of this incipient method, as no previous project had attempted to track a series of interactions between signers who do not know each other's languages. As well as contributing to the robustness of this new method, the post-hoc interviews are an innovative method in and of themselves. They were carried out with each participant on an individual basis, by research team members who were known to them and who had experience of their home country and native sign language.[2] The interviews consisted of sitting with the participant and watching the recording of the free conversation together, with the interviewer and interviewee both encouraged to stop the film at any time to discuss any particular sign, facial expression, disruption in dialogue, successful communication strategy, etc, that they wanted to clarify or highlight. Participants would explain what they were trying to say, or what they understood their conversational partner to be saying. The signers explored the reasons behind the linguistic choices they made and the content from their interlocutor that they did and did not comprehend during the free conversation, as illustrated in 1.1, 1.2 and 1.3 below.

The research team found these interviews extremely useful for clarifying what was said when necessary; for explaining the mental processes that were used, including choice/source of sign(s); and for verifying relevant background information. As exemplified below, the interviews allowed researchers to surmise that "all participants continuously entertain multiple simultaneous hypotheses, both about what their interlocutor is likely to understand (which then in turn influences the choices in their own signed output), and about the likely meaning of what their interlocutor is signing to them" (Zeshan 2015: 248).

---

**2** Because of the requirement for the cross-signers to have no shared language, it was necessary to use deaf intermediaries, one of whom was fluent in each participant's national sign language. Each intermediary was involved in interviews with their respective participant. This was part of the research team's ethical protocol, which emphasised creating opportunities for deaf signers (a typically disadvantaged and marginalised group) to take on active project roles whenever possible. This consideration superseded the empirical risk that the intermediaries' presence may influence the participants' communication strategies. The sign-switching team was also organised with this innovation in mind (see Chapter 3 by Panda and Zeshan, and Chapter 8 by Panda), by engaging the Burundian signers to annotate their own data, and inviting one of them to co-present at a conference (SIGN6 in Goa, India, in 2013).

**Table 1.** Interviewer-participant pairs and their languages and interpreters

| Interviewer | Interpreter | Participant | Language |
|---|---|---|---|
| UZ | KS (iSLanDS staff) | MH | Japanese Sign Language |
| UZ and NP | NP (iSLanDS associate) | MI | Indonesian Sign Language |
| UZ | PS (iSLanDS associate) | MS | Jordanian Sign Language |
| UZ | No interpretation needed | CP | British Sign Language |
| AB | MI (2012 participant) | AM | Indonesian Sign Language |
| AB | MS (2012 participant) | BF | Jordanian Sign Language |
| AB | AJ (facilitator) | AS | Nepali Sign Language |

The interviews took place as soon as possible after each conversation was recorded, and the interviewer conducted them in International Sign (and BSL in one case). Interpretation during the interviews was provided by the intermediaries, research team members who were fluent in participants' native sign languages (see Table 1). The requisite information about participants' multifaceted language backgrounds had already been collected prior to the filming, both to save time on the day of filming (cf. Quadros et al. 2015: 251–252) and to permit plenty of time to arrange the interpreters. In 2012 the interpreters were the iSLanDS staff members who recruited the participants, and in 2014 the interpreters were the facilitators, including two former participants (see Chapters 10 and 11). Extensive notes were taken of each interview to be used when analysing the data; though the signers expressed their feedback in the first person, the notes were written in third person for clarity (Zeshan 2015). The team did not film the interviews (which would have been ideal), because this would have necessitated a very lengthy and costly transcription process. The notes for the 2012 data were combined into one contiguous Excel file as two columns of text (one for each interlocutor's comments) with the relevant times from the video clip in a middle column to reflect how each pair's dialogue developed. The aim in creating these combined files was for researchers to be able to refer to them for insights into the awareness and perceptions of each pair during their communicative encounter (see Figure 1).

**Figure 1.** Combined Excel file for post-hoc interviews with MS and MH

A major rationale behind the addition of the post-hoc feedback interviews to the overall cross-signing methodology is that this type of communication tends to involve metalinguistic reasoning and experimentation. The most effective technique for investigating these mental processes is a dedicated discussion guided by an attentive interviewer.

This assumption seemed to be borne out gradually as a number of thought processes and strategies become apparent during the post-hoc interviews, including multimodal interaction, the exploitation of metalinguistic reasoning and skills, the active learning of signs, and the maximisation of opportunities to learn signs. Most of these processes rely on metalinguistic awareness, which is broadly defined as "conscious knowledge of the formal aspects of a language" (Rathmann, Mann and Morgan 2007: 192). It involves attending to the form of an expression, whether produced or received, and encompasses various levels of language use such as lexical, phrasal, syntactic, pragmatic and semantic (e.g. Tunmer and Bowey 1984). An additional aspect of the definition for the purposes of cross-signing is "the participants' awareness of their *interaction* and modification thereof, depending on the interlocutor and their respective perceived needs" (Byun, Bradford, Zeshan, Levinson and de Vos 2018). Being bi- and multi-lingual, perhaps unsurprisingly the participants seem able "to see a language as one particular system among many, to view its phenomena under

more general categories, and [to be aware of] linguistic operations" (Vygotsky 1962: 196). For the most part, the interviewers eschewed technical linguistic terminology, as this was unnecessary for the purposes of discussion and could have complicated the communication during the interview. In teaching contexts, even intermediate learners tend to use non-technical metalanguage, which has no adverse effect on the smooth operation of communicative activities (Basturkmen, Loewen and Ellis 2002).

Naturally, there are limitations in these post-hoc interviews, including the general weaknesses of the interview method that were mentioned earlier, as well as the more specific risks of memory decay and possible embarrassment from admitting to communicative "errors" or revealing that something was not understood. The former limitation was ameliorated by carrying out the interviews as soon as possible after the free conversations, to maximally reduce any memory attrition or misremembering by participants. The latter, potential embarrassment causing discomfort, was minimised by the research team's attention to participants' comfort and familiarity with the team members. This is one key reason why each participant was matched with an intermediary who had an in-depth knowledge of their country and language (e.g. the Japanese participant was matched with a team member who comes from Japan and is fluent in Japanese Sign Language; see Table 1 above). This is also part of the team's rationale for not filming the interviews, to reduce the anxiety that the camera would likely generate.

In the following three sub-sections, examples of metalinguistic reasoning (1.1), multimodal interaction (1.2) and other metalinguistic skills (1.3) that arose in the post-hoc interviews are highlighted, and the contributions they make to knowledge on these topics are discussed. The unprecedented method of MULTISIGN's cross-signing strand involved tracking participants' emerging communication in free conversations across a number of weeks. To glean as much information as possible about each conversation, post-hoc feedback interviews were carried out with an intermediary who interpreted and clarified certain aspects of the interview. This was done as soon as possible after each cross-signing interaction took place. It allowed the researchers firstly to eliminate ambiguities in the data, secondly to clarify what was understood by the participants, thirdly to give the participants the opportunity to discuss any frustration or confusion they experienced, and fourthly to consolidate any incidental language learning.

## 1.1 Metalinguistic reasoning

Firstly, evidence of metalinguistic reasoning and tracking what has been communicated to a particular person is abundant within the text of the post-hoc interviews. For example, in one dialogue, Indonesian signer MI asks about Japanese signer MH's deaf organisation in Tokyo, but MH does not understand MI's sign for 'organisation', so MI fingerspells O-R-G-A-N-I-Z-A-T-I-O-N, using the international/ASL alphabet for all letters, except 'R' and 'Z' which are from the Indonesian alphabet. MH identifies this when he sees the unfamiliar form for 'Z'. MH asks MI to repeat the word, and in the interview, MI reported that he was considering whether to sign 'G' using the index finger, or the index finger and thumb. MI thinks that MH must be familiar with these forms, because when they introduced each other earlier in the conversation, they were using the international alphabet. MI further explained in the post-hoc interview that he believes the ASL alphabet is international, so surmised that MH must surely know it. This example conveys perhaps how complex cross-signing can be, with the nuance of thoughts and assumptions very difficult to capture without post-hoc interviews. It appears that MI was engaged in careful tracking of what forms his interlocutor might already know, based on whether he had already seen MH use them and to what extent he believed that they were used internationally.

Another instance where the post-hoc interviews "provide explicit evidence that signers keep track of both the current conversation and previous conversations with other participants" (Zeshan 2015) is when MH stated that he had decided to sign the number '12' in the two-handed digital way, i.e. "signing the numerals as a sequence of individual digits, following the sequence of written numbers" (Zeshan 2015: 218). The two-handed way of doing this means that one hand articulates '1' while the other articulates '2'. MH signed '12' this way because he felt it was easier for CP to understand since they had signed '10' previously using this method. Another example is when MI reports that he used the Japanese sign for 'England' because he did not know the British sign for it, but he knew that CP had already met the Japanese signer so he surmised that she may know the Japanese sign for it.

In a further example from the data, a signer chose the ASL sign WHY because he guessed his interlocutor would understand ASL, based on what the signer knew about his background. Other occurrences of this phenomenon involve a signer remembering what signs they had used on prior occasions with their interlocutor, as occurs here with the Japanese participant MH and Jordanian participant MS (also see Figure 2):

*[from MH's interview] MH talks about going to the pub by bus. He used the Japanese sign for 'bus' and thinks MS should know it because MH had previously showed this sign to MS when they went to Blackpool together.*



**Figure 2.** MH articulates the JSL sign for 'bus'

In a few cases, signers had piecemeal knowledge of others' languages. The British participant CP, after producing the international sign for 'England', attempted the Jordanian sign, as she remembered it from a visit to Jordan.

## 1.2 Multimodal interaction

The post-hoc interviews show many occurrences of multimodal interaction, which refers to fingerspelling, mouthing, writing and tracing in addition to signing. These are all representations of spoken language that are accessible to deaf interlocutors, and tend to be especially useful for content that does not easily lend itself to articulation through iconically-motivated signs, characterisation, or spatial arrangement. In a paper on the cross-signing participants' use of numerals, Zeshan (2015: 247) asserts that "signers actively monitor intersubjective multilingual-multimodal repertoires" that are shared and "built up 'on the fly' for all kinds of semantic and grammatical domains, including more abstract domains such as colour".

For example, specific food items can be ambiguous when conveyed through iconic means. When communicating about rice with the Jordanian participant MS, Indonesian participant MI attempts a lexical sign as well as fingerspelling the English word R-I-C-E with three different alphabets, the third of which is understood by his conversational partner:

*[from MI's interview] MI wants to ask if MS if Jordanian people also eat rice. He starts to use the Indonesian fingerspelling to spell R-I-C-E (the English word). Then he tries to use the BSL fingerspelling alphabet. He has already found this alphabet on the internet. Then he uses the ASL fingerspelling alphabet, and MS then understands, and uses the Jordanian sign for 'rice'.*

*[from MS's interview] MS does not understand either the sign or the fingerspelling attempts with the Indonesian and British two-handed alphabets for 'rice', but he understands the third attempt using one-handed international fingerspelling. He knows the word* rice *from learning English at deaf school in Jordan.*

Other interesting forms of multimodal strategies occur when a participant traces a calendar on the wall, and Japanese kanji on his leg. Mouthing is also seen, as when a participant fingerspells his surname and adds a lip pattern, because he had previously seen his interlocutor use a speech gesture to signify a hard /g/ at the throat, and surmised that he was familiar with spoken forms of communication.

A key way in which the post-hoc interviews "illustrate the kinds of reasoning and trial-and-error that can be involved in the choice of lexical signs" (Zeshan 2015: 248) is in exploring the numerous mistakes, miscommunication and corrections that seem to be inherent in the experimental exploitation of multimodal skills in the data, which gradually give rise to the construction of a shared repertoire. Some examples of mistakes and failed attempts are discussed in the interviews:

*MS uses an unfamiliar sign with the thumb on the palm, together with some fingerspelling. He is trying to fingerspell 'Tokyo' but he misspells it. MH initially thinks he is asking about oil.*

*CP mimes to explain the concept of 'busy', but MH still does not understand. He thinks CP wants to talk about doing a lot of work* at the same time. *He thinks the focus is on the time.*

This suggests that post-hoc interviews are a useful learning and reflection tool for the participants, allowing them to recall their thought processes and, in discussing specific instances of miscommunication, develop their use of metalanguage. Jessner (2005: 66) finds that using metalanguage has a "control function" when people are producing their weaker language(s), as it often comes

before a switch between languages and may constitute "a kind of intermediate step towards the retrieval of the target language item" (see also Zeshan and Panda 2015).

## 1.3 Other metalinguistic skills

Apart from multimodal skills, the participants demonstrated an aptitude for creating and acquiring new signs, and for using features of sign languages that cut across individual languages, such as iconic motivations, spatial arrangement, and role shift or characterisation. Such signing-related metalinguistic awareness may also improve the reading and writing skills of signers; Rathmann et al. (2007: 195) note that "meta-linguistic awareness of how signed narratives are constructed [and] how to encode shifts in perspective and character motives can feed into the development of the same literacy skills in the written form".

Firstly, the post-hoc interviews reveal many instances of the participants' engagement in active learning, as they frequently take opportunities to perform and practise new signs. Lennon (1989) highlights the association among language learning, introspection and metalinguistic awareness, which has been shown to "enrich cognitive processes and go hand-in-hand with enhanced introspective powers" (ibid: 378) as well as contributing to language learners being "highly manipulative both of their environment so as to promote learning and of their production so as to promote communication" (ibid: 393). For example, the British participant CP saw the Indonesian participant MI use a mime for 'month'. Later in the same conversation, CP signed 'eight months' using this new mime. MI then wanted to check that CP did indeed intend to use the mime to mean 'month', and that he had understood her meaning correctly, so he asked, 'eight years?' When she responded negatively, he realised that she did mean 'eight months'. In this way, the post-hoc interviews with MI and CP demonstrate that both interlocutors ultimately played a role in CP's learning of a new form for 'month'. Similarly, in another conversation, MI asked the Jordanian participant MS what sports he likes. The post-hoc interview confirmed that MS did not understand MI's sign for 'sport'; MI then attempted to use the Jordanian sign for 'football', which he produced slightly incorrectly, prompting a correction from MS.

Sometimes participants resorted to creating novel signs, an option afforded by the myriad iconic possibilities open to users of sign languages, including "polymorphemic productive forms" (Brennan 1992) and "the cross-domain mapping that is present in conceptual metaphors" (Russo 2005: 344). For

example, in MS's post-hoc interview, he reveals that he created his own idiomatic sign to try to convey a concept to MI:

*MS uses a sign for 'keeping things secret' that he invented, thinking that the Jordanian sign would not be intelligible to MI.*

In taking such opportunities for exploiting iconicity, the signers also repeatedly demonstrated visual memory skills in conveying concepts through visual imagery, as exemplified by Jordanian participant MS:

*MS recognises that MH does not understand his sign for 'football', so he tries the sign for 'stadium' and the sign for 'devil', referring to the logo [of the team in question].*

However, the post-hoc interviews also show that what seem to be universal iconic motivations are often particular only to certain cultures and languages, and unknown in others. For example, MS assumed that the sign for 'hope', articulated with crossed fingers, would be understood as a common gesture by the Indonesian participant MI, but Indonesia has no such gesture:

*MS has said he hopes to run a deaf association in Jordan. MI does not recognise the sign for 'hope' with crossed fingers. There is also no gesture in Indonesia for crossing your fingers to mean 'hope'.*

Dedicated utilisation of the sign space is another metalinguistic skill that the participants report drawing on. In CP's post-hoc interview, it is explained that she manipulated the sign space to communicate the concept of 'months':

*CP tries to explain that she used to live with a roommate. MS does not understand CP's sign for 'month', thinking she had meant 'four years' or 'four days'. CP used the signing space to indicate the months, e.g. June, July, etc... MS then understood the concept of 'month' from this.*

Further skills that the signers appear adept at taking advantage of are role shift and characterisation. The Japanese participant, MH, resorts to these strategies after trying signs from British Sign Language (see Figure 3) and Japanese Sign Language to impart the concept of 'game' to MI:

*MH attempts to ask about the game, first using the British sign, slightly mispronounced, and then the Japanese sign for 'toy', followed by the sign for 'game'. MH explains the details of the game [using role shift to convey the perspectives of the players] and MI now recognises it from the fact that two pictures cannot be seen by the players. At this point MI has not played the game but knows about it.*

**Figure 3.** The Japanese signer articulates the BSL sign for 'game'

The complex introspection that such interviews require of participants gives them opportunities to build their critical awareness of language, as noted by Ogulnick (1999) with respect to applied linguistics studies. Because of this, the post-hoc introspective interviews can be seen as a facet of ethically robust and sustainable research that provides its participants and their communities with increased knowledge and skills. Studies that deliberately investigate the precise nature of this benefit and the degree to which informants' skills are enhanced would be useful in terms of establishing this as a standard protocol in research with deaf individuals and communities.

# 2  Elicitation materials and procedures in the sign-switching, sign-speaking and cross-signing strands

This section describes the rationales and procedures for the games that the research team used to elicit utterances for all three strands of MULTISIGN: sign-switching (2.1), sign-speaking (2.2), and cross-signing (2.3). For ease of reference, all of these elicitation activities are also listed in Table 2. The team adjusted the experiments to local contexts, and most materials were prepared

in the field, addressing the observation of Morford et al. (2015: 212) that "developing materials for empirical investigations of signed languages is an area of methodology that is ripe for innovation". Harnessing the skills of deaf team members was a priority for this component of the methodology as well. For the Indian sign-speaking study (2.2), pictorial materials were drawn live on site by a local deaf artist, while in Turkey, the sign-switching researcher led a game of Monopoly to elicit fingerspelling and numerals. The map activities for sign-switchers (2.1) were based on culturally well-known locations.

**Table 2.** Elicitation activities for all three strands of MULTISIGN

| Strand | Game | Setting | Target(s) |
|---|---|---|---|
| Sign-switching | Map game | India | Numerals, fingerspelling, WH questions and negation |
| Sign-speaking | Popular games, e.g. UNO, chess, Monopoly | India | Subordination and 'if' clauses |
| | | Turkey | |
| | Picture matching | India | WH questions |
| | Questions about pictures | | |
| Cross-signing | Colour game | Netherlands | Colour signs |
| | | India | |
| | Picture matching | UK | Emotions, entities and actions |
| | | India | Animate beings and inanimate objects |

## 2.1 Sign-switching elicitation

In India, the innovative data collection and methods for the sign-switching strand involved participants from two different populations (see also Chapter 8). The first group was participants who were bilingual in Burundi Sign Language (BuSL) and Indian Sign Language (ISL), and the second set

were bilingual in ISL and American Sign Language (ASL). For elicitation experiments with these bilinguals, the research team used maps which were discussed by the participants in pairs, and observed how much of each language they used, e.g. structures from BuSL versus ISL. One map had questions (e.g. \_\_\_km?) and the other had the answers to these (see Figure 4). The participants had to ask each other questions to find out the answers. Annotation on the maps, such as blanks, arrows and "km" for kilometres, presupposes (written) literacy. Because the questions and answers involved the topics of time, transport, and locations, the signers had to exploit a variety of forms including fingerspelling and number signs, which were target structures for this part of the research on unimodal sign bilinguals (see Chapter 3).

It was recognised by the researchers that the location represented on the map may be likely to affect language choice. Thus, another rationale for this activity was to prompt switching between BuSL and ISL by using maps from both Burundi and India, and from a third location abroad. The BuSL-ISL bilinguals had a map of Burundi and a map of their university campus in India, while the ISL-ASL signers had a map of south India and a picture of the London Eye, to represent a "foreign" place that was thought to have the potential to trigger ASL in the same way that the south India map may trigger ISL, because the participants had learned ASL from foreigners. In fact, most of the participants did not even recognise the London Eye, so it was indeed "foreign".
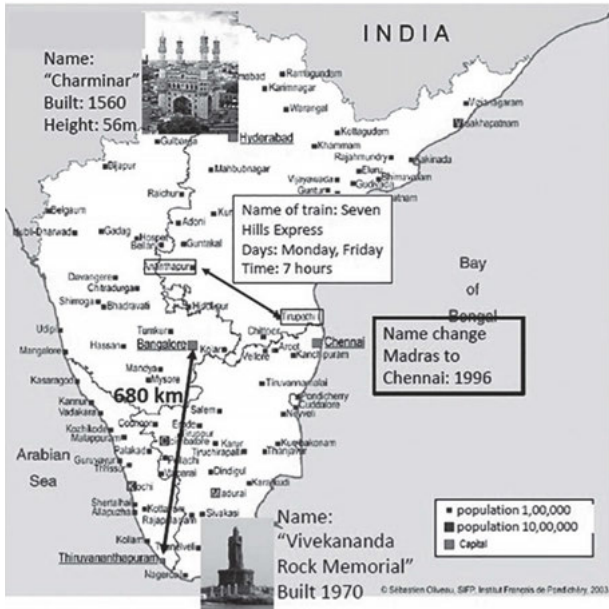
**Figure 4.** Materials for the map game

By the time of the Indian sign-switching experiments, innovative methods for this strand had already been utilised by the Turkish research team. The lead researcher in India determined that different elicitation materials were required to ensure participants' comfort and familiarity during the experiments, and thus maximise the quality and quantity of the data. The BuSL-ISL bilinguals were known to be familiar with their home region of East Africa, including Burundi, Uganda, and Rwanda, so a map of this area was used, including deaf schools, churches, and governmental institutions. An Indian map was also required, but as overseas students, they did not know the country as a whole very well. Therefore the research team designed a map of just the immediate vicinity of their campus in New Delhi, including university buildings, the metro station, shops, and restaurants. The relevance of this area to their daily lives enabled them to have discussions about the distances and travel time between locations, modes of transport, the costs of meals and supplies at various establishments, and the names of places on campus. In addition to numerals and fingerspelling, the question-and-answer format of this map experiment was also intended to encourage the production of negative and (WH) interrogative signs (see Zeshan and Panda 2015). The research team's cultural understanding and careful use of the participants' local knowledge was innovative and generated plentiful data.

During the experiments, the participants appeared quite engaged and answered their partners' questions in detail, reflecting their familiarity with the context. The innovative map experiments thus facilitated a natural ecosystem of interaction where the bilingual participants could take full advantage of their linguistic skills, whilst allowing the research team to isolate specific target structures like numeral signs and fingerspelling. A key aspect of this innovation was that it was an experimental setting, but at the same time, it was a "natural" situation generating relative fluency and spontaneity of utterances. Combining the strengths of both methods makes the sign-switching strand inventive in its approach to data collection (Zeshan and Panda 2015; Panda 2016).

In summary, the sign-switching data collection featured a bespoke activity that was expressly designed to prompt code-switching in a targeted yet relatively comfortable and spontaneous manner. This methodological approach differs from that of many studies on code-switching in spoken languages, which rely instead on settings where code-switching is common, such as a call centre (e.g. Lam and Yu 2013) or a chat room frequented by bilingual or bidialectal people (e.g. Siebenhaar 2006), or on instructing participants to switch to their other language by alerting them with randomly-generated signals or tones (e.g. Azuma 1996).

The sign-switching method also allowed the team to gather specific data on multiple constructions using materials that they produced themselves

within the field. This unusual combination of features has been rarely seen in other work, even in the related field of sign language typology, where games have been adapted to become culturally appropriate but are generated outside the field and often unable to target the full required range of structures. For example, for the "bargaining game" to elicit numerals (Sagara and Zeshan 2015), the researcher can select merchandise that is commonplace in that particular culture for participants to "haggle" over, but the game itself was not produced in or for a particular setting and it does not enable the researcher to pinpoint any specific numeral forms or structures.

## 2.2 Sign-speaking elicitation

The sign speakers also participated in elicitation sessions that made use of innovative methodologies. The aim of the sign-speaking elicitation was to encourage participants to produce the same utterance in the two different target languages, keeping the individual structures in the two target languages intact. These experiments were carried out in India, with participants who are bilingual in Hindi and ISL. It was originally intended to also execute these with a group of bilingual users of Turkish Sign Language (TİD) and Turkish; however, these individuals participated in 20 free conversations which indicated that they were not frequently using two different structures simultaneously, and therefore were not engaging in sign speaking (see Chapter 5), so performing the experiments with this Turkish group was deemed unnecessary.

In India, the methodology involved three different experiments making use of popular games, picture matching, and questions about pictures. In some research with bilingual bimodal individuals, precedence has been given to ensuring that stimuli are as comparable as possible across modalities and languages (Quadros et al. 2015: 253). However, the method here emphasises the use of stimuli that are authentic and locally-embedded, with comparability being of lesser concern. As per the innovation that has prevailed across the MULTISIGN study, the experiments emerged chiefly in the field, instead of being determined and prepared at the research institute.

The setting for the experiments was a large deaf school with about 500 students. The Indian field researcher had already visited this school many times before and knew its culture and the way people communicated there. Prior to the experiments, he observed the sign speakers by following them and taking note of when they simultaneously signed and spoke in a naturally-occurring situation. For example, families often visit and talk with the staff, so there are

deaf youngsters there with hearing family members who cannot sign, and staff sometimes act as interpreters to give access to everyone in the interaction.

Sign speaking is a highly unusual and difficult skill. Therefore, for this research, it was thought to be inadequate to simply display written sentences or pictures as fixed stimuli, because this might result in a somewhat forced, stilted combination of signing and speaking. After discussing this problem with the research team, the team devised some innovative means of elicitation that would facilitate more spontaneous sign-speaking. One of these was the picture matching game for which the materials were already prepared, as they had been used in an earlier sign language typology project (Zeshan and Perniss 2008). A map activity was also considered, but the Indian field researcher was aware that Indian people use maps in a limited way, so it was felt that games would be more culturally appropriate. The field researcher made a list of games that are popular in India and that could be used in this kind of school setting, and gathered a set of game materials. Some games were discounted, because they required one hand to be occupied, e.g. to hold cards, and both hands needed to be free for signing in the sign-speaking experiments.

These locally-known games were bought at a local market, and targeted subordination and 'if' clauses. The sign speaker gave explanations about and directed the game. The time allotted for these game-based experiments was limited to three days and therefore many drawings and photocopies had to be produced very rapidly.

In selecting the hearing and deaf interlocutors who were needed to engage in the experiments with the sign speakers, two things were important. First, they should be well-known and friendly with the sign speakers, in order to facilitate lively interaction, with minimal embarrassment and hesitation on the part of the sign speaker. Secondly, they needed to have had experience in situations where sign speaking was occurring. The hearing interlocutor, who needed to be fluent in Hindi but not in any sign language, required enough exposure to signing so as to be comfortable in the sign-speaking scenario, and such individuals fortunately could be commonly found in the vicinity of the school; the deaf person had to be a fluent signer who was unable to communicate in spoken Hindi. School children were not suitable; the interlocutors needed to be adults who had been educated to college level, to ensure they were of a similar intellectual background and could interact meaningfully. It was also essential that neither the hearing nor the deaf participant was familiar with the games that were being explained to them. This allowed the sign speaker to deliver a meaningful explanation, being genuinely more familiar with the games. The games were UNO, chess, and "Happy Hour". Not all sign speakers were equally au fait

with all three games, so the person most familiar with chess was selected to explain the rules of chess, and similarly for the two other games.

In fact, the participants' psychological connection to the activity was an important and potentially innovative consideration; they did not seem to characterise the game as a research activity. All of the individuals involved were known to each other at least superficially; the hearing and deaf interlocutors had some actual interest in learning the game; and the sign speakers were adept at explaining directions as they were all teaching staff. Therefore, these experiments were enacted in a fashion very similar to a real teaching situation, enhancing the validity of the data.

In addition to the games, they took part in the picture matching activity. For this "director-matcher" task (cf. Perniss 2007; Gullberg 2009; Zeshan 2015), the sign speaker had one set of about 18 different pictures, and the hearing and deaf interlocutors had two sets of similar pictures with some small differences between them. Taking each picture in turn, the sign speaker described what was shown, including the colours, positions, and directions of objects and people. Participants were also allowed to ask questions before choosing the correct target picture from their sets. For example, they might ask if there is a cap on the person's head in the picture. The researchers were pleased with the high level of interaction prompted by this activity.

As mentioned above, these pictures were already available from a prior study; however, because there were two "matchers" in this experiment instead of one, a second slightly different picture for each pair was produced. This was done in the field by a local artist (as was the next activity described below), who altered each picture by painting small modifications on it. Some of these pictures were odd for Indians; for example a house with a European-style smoking chimney was thought by the deaf participants to possibly be a factory because they did not conceptualise normal houses as having chimneys.

The next activity, designed in the field, required each sign speaker to ask a series of WH questions to one deaf and one hearing person at the same time, thereby compelling the sign speaker to use both Hindi and ISL. The two interlocutors then had to answer the questions by selecting one of three pictures on an A4 card, of which there were around 23 in total. The sign speaker had the same A4 card, but for the second round of these experiments, a hint was written on the sign speaker's card in English, to prompt them to ask a particular question (see Figure 5). In the first round, the sign speakers had sometimes asked a different, originally unintended question, as the question was not always clear from the three pictures themselves. This was not detrimental to data quality, as sign speaking was occurring in any case, but the activity, analysis and precise targeting of WH questions were easier when sign speakers asked the envisaged question.
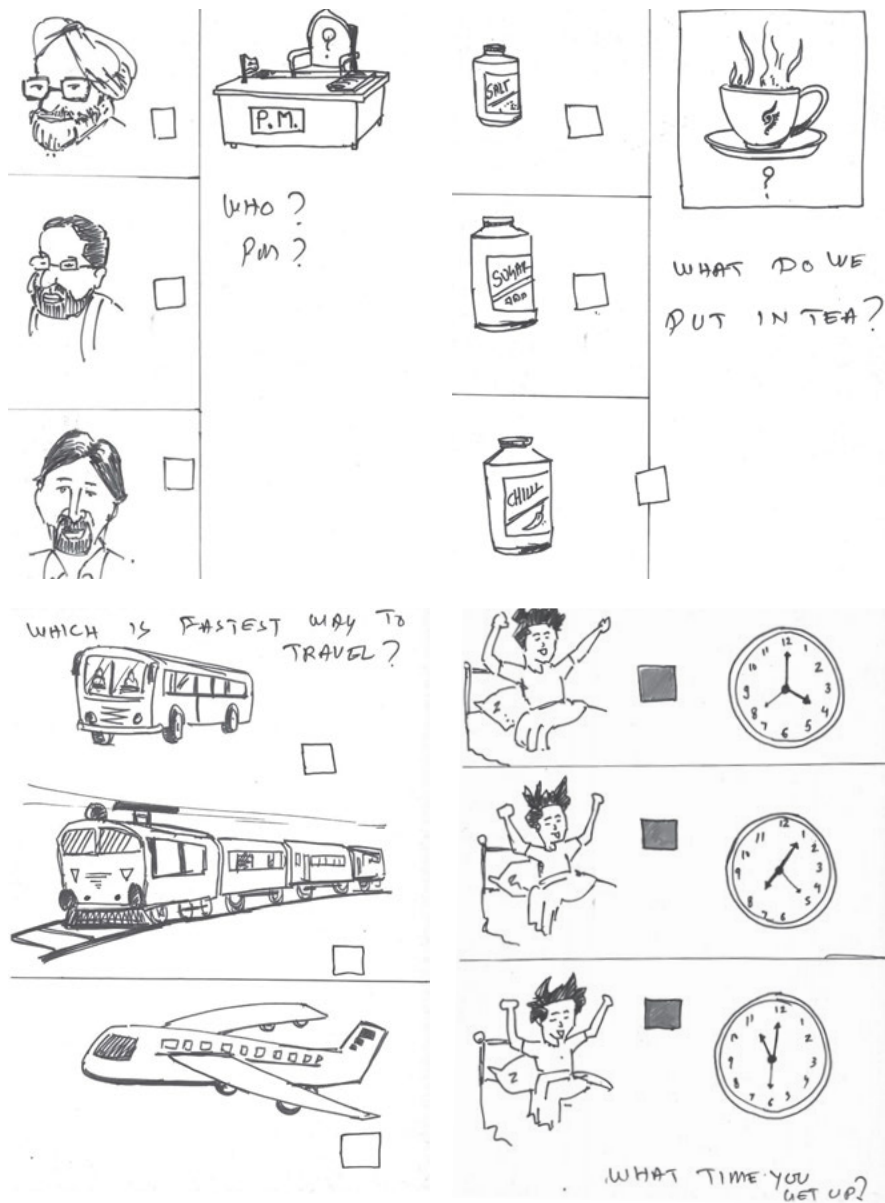
**Figure 5.** A selection of the elicitation cards used in the sign-speaking activity targeting WH questions

For each picture, the sign speaker tended to start by explaining what was depicted (e.g. a schoolteacher, farmer, and bank manager), and then asking, for example, "Who works in the bank?" Then the deaf and hearing interlocutors ticked the correct picture. Unlike the drawings used in the picture matching activity explained above, the 23 sets of pictures for this question task were all based on the Indian context, tailor made and produced on site by a local deaf artist in Indore, who was a college student employed at the deaf school. This represents an innovation in that the knowledge of local people in the field was utilised to take advantage of their ability to relate culturally to the communicative intent, rather than having the materials created by non-locals outside the field. Local artists tend to be able to devise materials that appear more familiar to the participants and lead to greater comfort in the elicitation setting, and this seems to have been achieved here. For example, in India, when someone is wearing Western clothes it is not always clear to a culturally Indian person whether that individual is male or female; therefore, in the drawings, gendered clothing was made more explicit such that the Indian participants could confidently identify each individual in the drawings as either a man or woman. This innovation of employing local expertise in generating elicitation materials was made possible by the lead field researcher's knowledge as a deaf education professional in India, which enabled him to select from among a number of talented deaf art graduates in the area.

Another benefit to the innovative methodology used in the sign-speaking strand was that the research team were given guidance from local deaf assistants that was invaluable and could be useful in planning improved procedures for future projects. These individuals, who the team met after arriving on site, accompanied the lead researcher as he gathered elicitation materials and offered suggestions for data collection tasks involving engaging game activities which would make participants comfortable and able to have relatively natural conversations.

However, selecting participants and preparing them for these game activities was challenging. It was possible that the complexity of the game reduced the participants' willingness to engage with it. Moreover, as alluded to above, it was difficult to select participants who were already somewhat familiar with each other. This minimises the deaf person's nervousness, which helps make the ethical standards optimal and ensures the data is as valid as possible. Ideally, the sign speaker might, for example, have a hearing cousin who knows deaf people well because they play cricket together or they have seen each other at weddings. So the sign speakers identified several deaf and hearing people who fell within their network and booked them to come in and see the research team. Some hearing individuals were not suitable as participants for this study

because they did not appear to be comfortable engaging in such a situation with deaf people; they seemed reticent to interact, which would have lessened the data. The researchers thanked and apologised to them and advised that they might be contacted later. The people that were ultimately selected were the more talkative hearing individuals who also demonstrated ease when in communication with deaf people, as it was felt that they would be most likely to facilitate ample numbers of utterances.

As for the actual procedure of the experiments, before starting on a game sequence, several deaf and hearing participants waited together in another room, where an interpreter was present but none of the sign speakers. They tended to chat and joke with each other whilst waiting. When they came into the activity room, the sign speakers themselves explained the project to the deaf and hearing person; this was not videotaped. The sign speakers were already familiar with the project because there had been a previous sequence of field-work which was not based on elicitation activities, and they had in fact already given their consent. The sign speaker explained to the other participants the aim of the project and why they would be signing and speaking simultaneously, and then distributed consent forms. This not only permitted informed consent to be obtained, but it helped the participants to get used to the situation of someone signing and speaking at the same time.

It is important to point out that risks and benefits were both associated with certain aspects of the setting and procedure. Firstly, the researcher was familiar with the field site and the people there, who knew him as an adviser to the school board. This gave him much greater access and willing cooperation than perhaps another researcher might have received. Requests were fulfilled promptly on the whole. This could possibly have made participants feel more compelled to take part than otherwise, and the researcher was aware of his influence in the setting and attempted to ameliorate it through careful explanation of the project's ethical procedures including the complete acceptability of any disinclination to participate for any reason. Being known to others at the site was undoubtedly advantageous in terms of the logistics of the data collection. Plans and ideas had been devised to some extent prior to the researcher's arrival on site, but he needed to improvise on the spot as well. This made the logistics tricky and necessitated the simultaneous organisation of many things such as buying and making materials and finding illustrators. For a researcher heretofore unknown in this setting, such improvisation would have been impossible. In addition, certain practical and environmental challenges such as excessive noise arose which were perhaps easier to deal with given the researcher's familiarity with the context. The environment at the school is quite loud, with dogs barking, cars and people passing by, and many disturbances.

Another issue is that electricity cuts are frequent in this region. There is also a difficulty caused by the high humidity that is typical in this region, because when the ceiling fan was on, its noise reduced the quality of the audio, but when it was turned off, the room became too hot. Finally, as mentioned above, it was decided that the participants should be somewhat familiar with each other, but they were not really close friends and sometimes did not appear to be sufficiently at ease with one another. In particular, in mixed-gender groups, a female may not feel that she can be open and might not participate fully, as shyness in females is expected in the culture. On the other hand, it was not desirable that all participants should be from one gender only, because both males and females engage in cross-signing and to exclude one gender would make the findings less reliable.

## 2.3 Cross-signing elicitation

In addition to the free conversations and post-hoc introspective interviews (see section 1 above), the methodology for the cross-signing strand involved elicitation experiments carried out in the UK in 2012, and India in 2014. Both rounds of elicitation made use of picture pairs, in games played in dyads (two signers at a time). Player B would hold three pictures, while player A had one of these pictures. Player B was expected to find out from player A which picture s/he held. Player B was permitted to ask any question to determine this, but player A had to give answers and descriptions without seeing B's pictures. The signers alternated turns so that every other turn, they held three pictures. The researchers leading each of these rounds briefed the participants by explaining the game and giving a short demonstration as both signer and receiver. These pictures were associated with different target items in each of the two rounds. The first round elicited signs for emotions, entities, and actions; the second round targeted animate beings and inanimate objects (see Chapter 4).

In the first round, carried out in the UK in 2012, there were three targeted categories: actions, emotions, and entities (i.e. objects and persons such as a policeman, soldier, or referee as shown in Figure 6). A picture in the 'action' category might show a man fixing a vehicle. 'Emotion' pictures showed faces, e.g. yellow smiley faces and other typical emoji. However, this proved not to be ideal, as the participants tended not to sign e.g. 'happy', but rather just described the structure of the face (e.g. tracing a smile). Thus, these pictures were not useful for eliciting actual signs for emotions, so instead, participants were explicitly asked, "What is the sign for this in your sign language?"

**Figure 6.** Some of the images used in the cross-signing elicitation experiments for the 'person entities' category, targeting the entities 'policeman', 'soldier' and 'referee'

This data collection procedure was reasonably simple to prepare, and enabled the team to elicit data on a desired topic through relatively natural, spontaneous discussion of the images. The participants appeared to enjoy the game as well.

Participants were prepared for the game through an explanation from the research assistant, who showed an example of another researcher playing the game, and encouraged them to talk freely about the pictures without feeling that they had to choose the correct picture right away. The setup required four chairs: two for the participants, and two for the pictures, so that each player could hide them from his/her partner's view, using the back of the chair.

In retrospect, some of the pictures were inadequate for certain signers; for example, one or two depicted something foreign to a participant's culture (e.g. a tuk-tuk), which caused difficulty as they were not sure how to interpret the picture. If the team were to carry out this experiment again, improved procedures would include carefully recording who used which pictures, and ensuring that each picture is clearly visible to the camera for greater ease in working with the video data subsequently.

Of course the key innovative feature of this elicitation activity is the fact that the participants did not share any language; this caused many challenges for the participants as they had to exploit other strategies for communication. When one or more of these strategies was made unavailable to them (e.g. when the topic was colours and there was not a pertinently-coloured object nearby to point to), the communication task became even more difficult. While the team did not try this activity with non-signers, they were able to observe some hearing BSL students playing the game. It was difficult for these individuals not to use BSL (whereas this was less problematic for the deaf participants), and

their progress through the game was slower, perhaps due to their less-developed signing fluency.

Because the same game was repeated at different times across a four-week period, the team was able to surmise that processing times were shorter during the second meetings (i.e. participants took less time to determine the content and match the pictures). They also noticed that there was an increase in the use of lexical signs, as well as more borrowing from Indian Sign Language and the participants' own respective sign languages.

For the second round, performed in 2014 in India, it was decided to use the same task, but with slightly different categories: inanimate objects and animate beings. The previous pictures were included in this round, and further pictures were also sourced. In addition, the 'emotions' category was dropped because the first round had shown that these picture stimuli do not tend to elicit signs for emotions.

The colour game was carried out in India under the supervision of the project's research assistant, with the same four participants as the picture matching game, who were from Nepal, India, Indonesia, and Jordan. The game was repeated at different times over four weeks, targeting signs for colours. It was a director-matcher task (like that described in section 2.2) that required 24 colour chips and 10 line drawings. Unlike the picture matching game described above, which was carried out twice for each round, this colour game was played three times. The first time was followed by a second opportunity one week later, and a third time two weeks after that. The participants were filmed in pairs, two pairs at the same time, and switched partners for further permutations.

Using the 10 pairs of line drawings (see examples in Figure 7), the participants had to communicate to find out which objects were in different colours and which were the same. The director had a picture with several items coloured (e.g. blue shirt, brown desk), unseen by the matcher. The director described each colour to the matcher, who asked questions as needed and tried to select the appropriate colour chip and place it on the relevant object in her/his drawing. Eight different colours were involved in each interaction, so with 24 colours in total, each pair of participants played the game three times to cover all the colours.
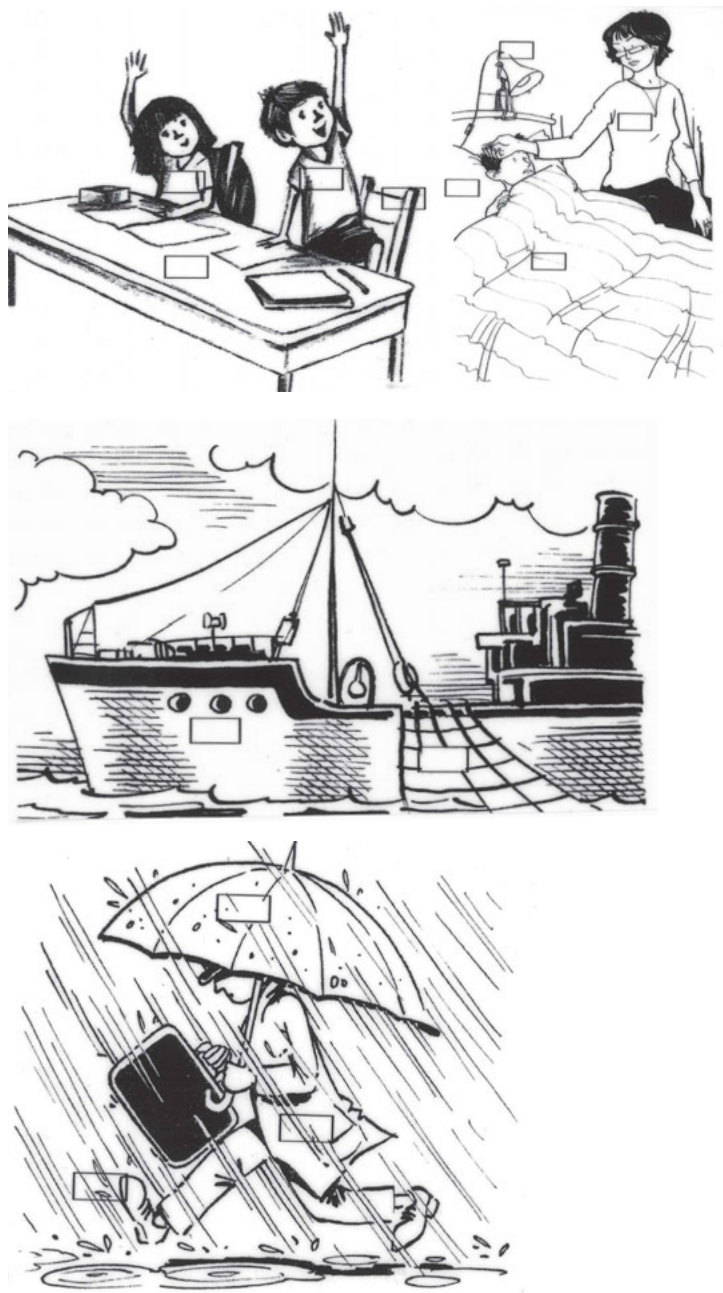
**Figure 7.** Materials used for the game eliciting colour signs, with rectangles where the matcher had to place the appropriate colour chip

Prior to the coding, each participant was asked explicitly for their signs for each of the 24 colours, so that the researcher would know how to transcribe each sign.

The colour game was ideal for ensuring a substantial contribution from each participant. With elicitation, it can of course be quite problematic if one person does not contribute, or just nods, as the researcher cannot be sure that they have understood. The active choosing of colours required by the colour game demonstrates understanding. Because there were 24 colours involved in the game, they had to be described quite intricately and specifically, and it was interesting to manage this communication. It was sometimes difficult for participants to convey slight variations in shades, e.g. brighter red and darker red, and often they used the same sign for both.

The researchers' hypothesis was that the participants would use their own lexical signs at first but at each meeting understand more and more of the other person's signs. They also thought that there would be more pointing at the beginning and less as time went on. However, they were not investigating pointing, which is primarily gestural and cross-modal (e.g. Barbarà and Zwets 2013), so to reduce its frequency, the researcher ensured that objects and papers were removed from the filming area. Participants may also be tempted to point at their own clothes, so they were given a black covering to put over their clothing to try to further reduce occurrences of pointing.

The number of colour chips to use was a thorny issue for the researchers. The original plan was to use 39 colours, but 24 were selected to make the elicitation more manageable. However, it was problematic to select individual colours out of only 24 in total, as there are so many possible colours. For data collection in the future, worthwhile adjustments might include the use of this wider range of colours; drawing on literature about the signification of different colours in different cultures; and taking note of differences between hues as they appear on the computer screen and on paper, as this caused some anomalies.

As mentioned above, this experiment was done three times instead of only two, because this allowed the researcher to identify a middle point in participants' communicative development. If it is done just twice, this only provides a picture of the beginning and end; what has happened in the middle is then unclear. Having more information about their linguistic evolution permitted the researchers to examine the development of variation, selection, and imitation, over more than just one period of time (see Byun et al. 2018).

# 3 Conclusion

The methodological innovations involved in all three strands of the MULTI-SIGN project prioritised authenticity, local embedding, and an ethical perspective that promotes capacity-building, rather than prioritising the generation of data that is highly comparable and standardised. The post-hoc interviews, in which participants engaged in metalinguistic reasoning and multimodal interaction, have facilitated several important contributions to wider knowledge about cross-cultural signed communication. Though interviews are a common method in linguistic research on both spoken and signed languages (e.g. Lam and Yu 2013; Hill 2015), they are rarely carried out in this manner, i.e. asking the participant about the actual data while viewing it together. These interviews encouraged and exploited introspection, which was essential because this was the first time that cross-signing data had been gathered from individuals with no shared language, and cross-signers' perceptions of their communicative decisions and strategies were the first necessary step in an inductive enquiry into this complex phenomenon.

During the interviews, the participants drew a great deal on their metacognition and metalinguistic skills. Further implementation of this method may enable future research to explore the extent to which building a metalinguistic vocabulary boosts cross-signers' multilingual capacity and facility. This kind of method might also be utilised with hearing non-signers using gestures, for comparative purposes. It is interesting to consider how comparable the gesturing abilities of hearing people are in this context. Looking more closely at the gesturing of hearing people who do not share a language would be a fascinating future project, enabling an investigation of the effects from culture and confidence, for example (cf. Cartmill, Hunsicker, and Goldin-Meadow 2014; Sekine and Kita 2015).

Although it is not always desirable to aim primarily at data comparability, standardising methods would be beneficial to the field of sign language research, as suggested by Morford et al. (2015: 219–221). This might include a uniform way of selecting stimuli; measuring onset of reaction time (e.g. at what physical point an utterance can be said to commence); and listing details about informants' backgrounds, e.g. gender, age at sign language acquisition, and level of education (Morford et al. 2015). Furthermore, sign language researchers are only just beginning to explore the innovation angle in their field, so this is very much an emerging area of work with great scope for developing and refining standardised methodologies. However, it is worth pointing out that while such standardisation could be beneficial, this should not be the ultimate goal, because it is far more valuable for sign language linguists to continue exploring innovative ways to improve research design.

# References

Azuma, Shoji. 1996. Speech production units among bilinguals. *Journal of Psycholinguistic Research* 25(3). 397–416.

Barberà, Gemma & Martine Zwets. 2013. Pointing and reference in sign language and spoken language: Anchoring vs. identifying. *Sign Language Studies* 13(4). 491–515.

Basturkmen, Helen, Shawn Loewen & Rod Ellis. 2002. Metalanguage in focus on form in the communicative classroom. *Language Awareness* 11(1). 1–13.

Brennan, Mary. 1992. The visual world of British Sign Language: An introduction. In David Brien (ed.), *Dictionary of British Sign Language/English*, 1–118. London: Faber and Faber.

Byun, Kang-Suk. 2016. *Cross-signing*. Ishara Signed Publications No. 3. Nijmegen: Ishara Press.

Byun, Kang-Suk, Connie de Vos, Ulrike Zeshan, Anastasia Bradford & Stephen C. Levinson. 2018. First encounters: Repair sequences in cross-signing. *Topics in Cognitive Science* 10(2). 314–334.

Cartmill, Erica A., Dea Hunsicker & Susan Goldin-Meadow. 2014. Pointing and naming are not redundant: Children use gesture to modify nouns before they modify nouns in speech. *Developmental Psychology* 50(6). 1660–1666.

Edley, Nigel & Lia Litosseliti. 2010. Contemplating interviews and focus groups. In Lia Litosseliti (ed.), *Research methods in linguistics*, 155–179. London: Continuum.

Fenlon, Jordan, Adam Schembri, Trevor Johnston & Kearsy Cormier. 2015. Documentary and corpus approaches to sign language research. In Eleni Orfanidou, Bencie Woll & Gary Morgan (eds.), *Research methods in sign language studies: A practical guide*, 156–172. Chichester: John Wiley & Sons.

Gullberg, Marianne. 2009. Reconstructing verb meaning in a second language: How English speakers of L2 Dutch talk and gesture about placement. *Annual Review of Cognitive Linguistics* 7(1). 221–244.

Hill, Joseph C. 2015. Data collection in sociolinguistics. In Eleni Orfanidou, Bencie Woll & Gary Morgan (eds.), *Research methods in sign language studies: A practical guide*, 193–205. Chichester: John Wiley & Sons.

Jessner, Ulrike. 2005. Multilingual metalanguage, or the way multilinguals talk about their languages. *Language Awareness* 14(1). 56–68.

Lam, Marvin & Carol Yu. 2013. English and Cantonese in a bilingual call centre in Hong Kong. *World Englishes* 32(4). 521–535.

Lennon, Paul. 1989. Introspection and intentionality in advanced second-language acquisition. *Language Learning* 39(3). 375–396.

Litosseliti, Lia. 2003. *Using focus groups in research*. London: Continuum.

Morford, Jill P., Brenda Nicodemus & Erin Wilkinson. 2015. Research methods in psycholinguistic investigations of sign language processing. In Eleni Orfanidou, Bencie Woll & Gary Morgan (eds.), *Research methods in sign language studies: A practical guide*, 209–249. Chichester: John Wiley & Sons.

Noble, Tracy, Rachel Kachchaf, Ann Rosebery, Beth Warren, Mary Catherine O'Connor & Yang Wang. 2014. Do linguistic features of science test items prevent English language learners from demonstrating their knowledge? Paper presented at the Annual Meeting of the National Association of Research on Science Teaching, April, Pittsburgh, PA, USA.

Nyst, Victoria. 2015. Sign language fieldwork. In Eleni Orfanidou, Bencie Woll & Gary Morgan (eds.), *Research methods in sign language studies: A practical guide*, 107–122. Chichester: John Wiley & Sons.

Ogulnick, Karen L. 1999. Introspection as a method of raising critical language awareness. *Journal of Humanistic Education and Development* 37(3). 145–159.

Panda, Sibaji. 2016. *Sign-switching: Indian Sign Language and Burundi Sign Language*. Ishara Signed Publications No. 4. Nijmegen: Ishara Press.

Perniss, Pamela. 2007. *Space and iconicity in German Sign Language* (DGS). Nijmegen: Max Planck Institute for Psycholinguistics PhD thesis.

Quadros, Ronice Müller de, Deborah Chen Pichler, Diane Lillo-Martin, Carina Rebello Cruz, Laura Kozak, Jeffrey Levi Palmer, Aline Lemos Pizzio & Wanette Reynolds. 2015. Methods in bimodal bilingualism research: Experimental studies. In Eleni Orfanidou, Bencie Woll & Gary Morgan (eds.), *Research methods in sign language studies: A practical guide*, 250–280. Chichester: John Wiley & Sons.

Rathmann, Christian, Wolfgang Mann & Gary Morgan. 2007. Narrative structure and narrative development in deaf children. *Deafness and Education International* 9(4). 187–196.

Russo, Tommaso. 2005. A crosslinguistic, cross-cultural analysis of metaphors in two Italian Sign Language (LIS) registers. *Sign Language Studies* 5(3). 333–359.

Sagara, Keiko & Ulrike Zeshan. 2015. Semantic fields in sign languages: A comparative typological study. In Ulrike Zeshan & Keiko Sagara (eds.), *Semantic fields in sign languages: Colour, kinship and quantification*, 3–38. Berlin: Mouton de Gruyter and Nijmegen: Ishara Press.

Sekine, Kazuki & Sotaro Kita. 2015. Development of multimodal discourse comprehension: cohesive use of space by gestures. *Language, Cognition and Neuroscience* 30(10). 1245–1258.

Siebenhaar, Beat. 2006. Code choice and code-switching in Swiss-German internet relay chat rooms. *Journal of Sociolinguistics* 10(4). 481–506.

Tunmer, William E. & Judith A. Bowey. 1984. Metalinguistic awareness and reading acquisition. In William E. Tunmer, Chris Pratt & M.L. Herriman (eds.), *Metalinguistic awareness in children: Theory, research and implications*, 144–168. Berlin: Springer.

Vygotsky, Lev S. 1962. *Thought and language*. Cambridge, MA: MIT Press.

Zeshan, Ulrike. 2015. "Making meaning" – Communication between sign language users without a shared language. *Cognitive Linguistics* 26(2). 211–260.

Zeshan, Ulrike & Pamela Perniss (eds.). 2008. Possessive and existential constructions in sign languages. Nijmegen: Ishara Press.

Zeshan, Ulrike & Sibaji Panda. 2015. Two languages at hand: Code-switching in bilingual signers. *Sign Language & Linguistics* 18(1). 90–131.