2 Data & general methods

This chapter provides an overview over methods and procedures used in this thesis, both for data collection and analysis. It also serves to situate the data in a sociolinguistic context via a brief description of the region in the Peruvian Andes they come from, and some sociodemographic key characteristics of their bilingual speakers.

2.1 Data collection

The speech data analyzed in this work was collected by Raúl Bendezú Araujo, Uli Reich, and the author during two field trips to the central Andean town of Huari in Ancash, Peru in August – October, 2015, and April – June, 2017. The field trips were part of a research project funded by the *Deutsche Forschungsgemeinschaft (DFG)* with the title *Zweisprachige Prosodie: Metrik, Rhythmus und Intonation zwischen Spanisch und Quechua* ("Bilingual prosody: meter, rhythm, and intonation between Spanish and Quechua", PI Uli Reich).[3] Potential participants for the recordings were contacted via a friend-of-a-friend-approach, through initial contact with Leonel Menacho López in Huaraz and Gabriel Barreto Echiparra in Huari, both of whom acted also as native speaker consultants for the production of the experimental materials and in general. Their contributions were invaluable to the success of the research project as a whole. Speakers participated of their own free will, and gave written consensus to be recorded and have their data published anonymously. They were remunerated financially for their time. Recordings took place in various localities in Huari. Efforts were made to record in silent, closed environments and to reduce background noise during recordings as much as possible. However, the surrounding soundscape of a rural Andean town could not always be excluded. The data used in this thesis comes from those recordings that were the best both in terms of recording quality and naturalness of production, i.e. from speakers that spoke freely and comfortably, and enjoyed participating in the tasks. Recordings were made using a mounted Røde NT-1A condenser microphone and a Marantz

3 The DFG-project number is 274614727. Its website is at: https://www.geisteswissenschaften.fu-berlin.de/we05/institut/mitarbeiter/reich/forschung/DFG-projekt-zweisprachige-Prosodie/index.html. It contains links to those data that are already available online, descriptions of the experimental tasks, and a full list of contributors to the project. The project extends the same elicitation methods to other language pairs in Latin America, including Guaraní-Spanish in Asunción (Paraguay) and Nheengatú-Portuguese in Saõ Gabriel da Cachoeira (Brazil), for which data is in the process of being published on the website.

https://doi.org/10.1515/9783111304595-002

PMD 670 audio recorder (in 2015) or a Zoom H4N audio recorder (in 2017) in 44.1 KHz (BPM). The Quechua data recorded in 2015 were transcribed and translated by bilingual students and Leonel Menacho at the Universidad Nacional Santiago Antúnez de Mayolo (UNASAM) in Huaraz, and their morphology annotated by students at the Pontificia Universidad Católica del Perú (PUCP) in Lima and Leonel Menacho. They were paid for their work. Transcriptions and annotations were checked for consistency by Raúl Bendezú Araujo and the author, in accordance with the glossing conventions devised by them, Uli Reich, and Leonel Menacho, based on Parker (1976) and Max Planck Institute for Evolutionary Anthropology (2015). The full list of glosses can be found at the beginning on this thesis. They are also the glosses used in each Huari Quechua example in this study. The Spanish data were transcribed and translated by students at Freie Universität Berlin, Raúl Bendezú Araujo, and the author.

2.2 Brief description of Huari and its linguistic situation

Figure 1: Map of Huari within Ancash (left), and within Peru (right). © OpenStreetMap.

Huari is a small town of about 5000 inhabitants, the capital of the province of Huari in the department of Ancash, whose capital is Huaraz. It lies on the eastern slopes of the cordillera blanca range of the central Andes in the Conchucos region (cf. Figure 1). Until 2016, the main road into Conchucos was not fully tarmacked (Wikipedia 2021b), limiting access to the region. The area is one of the regions in Peru with the highest share of the population giving Quechua as their first language (cf. the left map in Figure 2). In Huari province, 72.7% of the population stated in

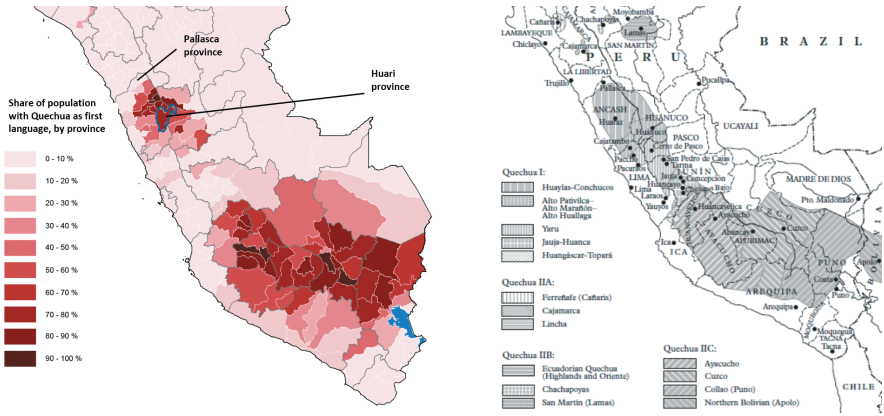

Figure 2: Maps of the share of the population that names Quechua as first language per province in central and southern Peru (left)[4] and of the distribution of the Quechuan languages in the same area (right, from Adelaar & Muysken 2004: 184).

2017 that Quechua is the language in which they learned to speak, while 24.7% said that it is Spanish; out of a total population of about 60.000 (Instituto Nacional de Estadística e Informática 2018). The variety of Quechua spoken in Huari belongs to the branch of Quechuan languages[5] that is variously called Quechua I, Quechua B, or central Quechua. I will refer to it as Quechua I when necessary. Quechua I varieties are spoken in the central Peruvian Andes, mainly in the mountainous parts of the departments Ancash, Huánuco, Junín, Pasco, and Lima (Adelaar & Muysken 2004: 185, cf. also the map on the right in Figure 2). The other main branch of Quechuan is called Quechua II or A, and its varieties are spoken in southern Peru including Cuzco, Bolivia, and a small enclave in Argentina, as well as in Ecuador, areas of Amazonian Colombia and parts of northern Peru. The Quechua I branch has a far greater internal diversity on a much smaller area, which is why the area where its varieties are spoken has been suggested as the Quechua homeland (Adelaar & Muysken 2004: 181). The Quechua varieties in Conchucos both differ from those spoken in Huaylas on the other side of the cordillera blanca and show a considerable internal (phonological) diversity (Parker 1976: 28). Diversification is plausibly due to the mountainous terrain facilitating the maintenance of very local

4 Map adapted from Wikipedia (2021a) based on data from Instituto Nacional de Estadística e Informática (2018).

5 All in all, 8–10 million people are estimated to speak languages belonging to the Quechuan family in an area extending from Putumayo in Southern Colombia throughout Ecuador and Peru and into parts of Bolivia, with small numbers of speakers also in Argentina and Chile, and internal diversity in the family comparable to that in the Romance or Slavic families (Adelaar & Muysken 2004: 168).

linguistic traditions. In the northern part of the Conchucos region, Sihuas Quechua and Corongo Quechua have been claimed and partially described as separate varieties (Parker 1976: 28; Hintz 2000; Hintz & Hintz 2017), while the Quechua spoken in the southern part including Huari province has been called South Conchucos Quechua but also described with some further internal variation (Hintz 2006, 2007; Hintz 2014; Hintz & Hintz 2017). For practical purposes, I will call the data sample analyzed in this work simply Huari Quechua and Huari Spanish by virtue of it having been recorded in Huari by speakers living in Huari town. The analysis itself will show how much variation still exists in this sample,[6] but I will remain agnostic about how much difference there might have to be in order to say that it consists of separate varieties or whether this is even a useful measure. Parker (1976) is a grammar of Quechua varieties that include Huari Quechua. More general grammatical descriptions of Quechua can be found in Cerrón-Palomino (1987); Adelaar & Muysken (2004). These works have a strong focus on morphosyntax and segmental (morpho-)phonology. Apart from brief impressionistic descriptions in Parker (1976) and comparatively short studies of the South Conchucos Quechua stress system (Stewart 1984; Hintz 2006), as well as our own previous work on acoustic correlates (Buchholz & Reich 2018), the prosody of both Huari Quechua and Huari Spanish is undescribed. See section 3.3.3 for a more detailed review of what is (not) known about the prosodic characteristics of Quechua in Conchucos.

Regarding Spanish, to my knowledge almost no studies from any linguistic subdiscipline exist of a variety from a region close to Conchucos. Andrade Ciudad (2016) is a study of northern Peruvian Spanish varieties (not their prosody) that includes data from the northernmost tip of Ancash, but specifically from Pallasca province (Andrade Ciudad 2016: 32), where Quechua bilingualism is actually very low (0–10% Quechua as first language, cf. both maps in Figure 2). Andrade Ciudad (2021) lists only one further small work on any variety of Spanish from the entire department of Ancash apart from Andrade Ciudad (2016). He concludes that what has come to be called "Andean Spanish" in the literature is a label for a somewhat heterogeneous cluster of varieties and almost exclusively drawn from studies of bilingual southern Peruvian regions, especially Cuzco (Andrade Ciudad 2021: 128–133).[7] One of the

6 In terms of prosody this will be made explicit, but the examples in the work also demonstrate in passing, as it were, that variation exists at various levels. In Huari Spanish this concerns e.g. the realization of the 3rd person singular present indicative form of *estar*, which is *está* for most speakers, but seemingly regularly *tá* for some (cf. note 177). In Quechua there is e.g. some variation in pronunciation, as between *tsuqllu* [t͡suxʎu] and *chuqllu* [t͡ʃuxʎu] 'corncob' (cf. Figure 126 vs. Figure 158).

7 He relates this to a broader academic tendency to favour the southern Andes and the Cuzco region as object of study in various disciplines (Andrade Ciudad 2021: 133). A similar imbalance

most salient phonological features described for "Andean Spanish" is not attested for the monolingual Northern Peruvian varieties studied by Andrade Ciudad (2016: 224–225), the variant realization of high and middle vowels called *motoseo*, in which e.g. *mesa* 'table' is said to be produced as a homophone of *misa* 'church mass', or *poro* 'leek' of *puro 'pure'*, and vice versa. This phenomenon is usually connected to bilingualism with Quechua, which only has three vowels /a i u/ or /a ɪ ʊ/ instead of the Spanish five /a i u e o/.[8] Since Huari is a fully bilingual area but the Quechua spoken is very different from the Quechua II varieties in regions on which the description of "Andean Spanish" has mostly been based (mutual intelligibility is usually said not to exist at least between the two main branches of Quechua, cf. Parker 1976: 24, see also Adelaar & Muysken 2004: 188–191 for a list of divergent features), neither what has been described for southern "Andean Spanish" nor for the monolingual northern varieties by Andrade Ciudad (2016) can simply be assumed to hold for Huari Spanish. This applies also to the prosodic descriptions of Cuzco Spanish by O'Rourke (2005, 2012), for which also see sections 3.4.4 and 3.5.1.

In Huari town, our own observations as well as statements by a number of people interviewed suggest that the overwhelming number of inhabitants are bilingual and use both languages in daily interaction, yet we also met a few individuals who were functionally monolingual in either Spanish or Quechua.[9] Short interviews were conducted with all experimental participants. Apart from eliciting basic sociolinguistic characteristics (see next section), participants were also asked which language they would normally use in different communicative situations, e.g. to speak with one's family, with friends, with unknown people, with authorities, in the market, etc. The responses from 39 bilingual participants that were

seems to prevail in studies on Quechua, although a number of detailed descriptions of Quechua I varieties exist (cf. Adelaar & Muysken 2004: 193–194). Quechua I varieties are certainly underrepresented in terms of instrumental prosodic studies compared to Cuzco Quechua (see sections 3.3.3 and 3.7.3.2).

8 Guion (2003) investigates quality of front and back vowels in bilingual speakers of Spanish and Ecuadorian Quichua and monolingual Spanish speakers and paints a more nuanced picture: some speakers do not have separate realizations for /i/ and /e/, and /u/ and /o/, respectively, but others do. Some even produce three front vowels, two ([i] and [e]) for Spanish, and a distinct [ɪ] for Quechua, with the most differential system most often found with the earliest bilinguals. Pérez Silva et al. (2008) present similar results on Cuzco Spanish and Quechua: less proficient bilinguals produce Spanish mid and high vowels with more overlap in F1 than Spanish monolinguals, but more proficient bilinguals have a similar vowel space to monolinguals. They make the important sociolinguistic point that the characterization that Quechua speakers "confuse" the vowels (e.g. produce [misa] meaning /mesa/ and vice versa) is a baseless racist prejudice against the indigenous population.

9 Data by one monolingual Quechua speaker is contained in Bendezú Araujo et al. (2019).

interviewed in 2015 are given in Figure 3. These are of course self-reports, so based on the assessments of the speakers themselves, and therefore shaped by individual biases and value judgements. They thus give a measure of the subjective perception of language prevalence in a given situation rather than an objective measure of it. Participants were all bilingual and selected via a friend-of-friend-approach, so the results are not representative for the population of Huari as a whole. However, they still suggest tendencies regarding a possible functional differentiation according to communicative domains between Huari Quechua and Spanish for bilingual speakers.

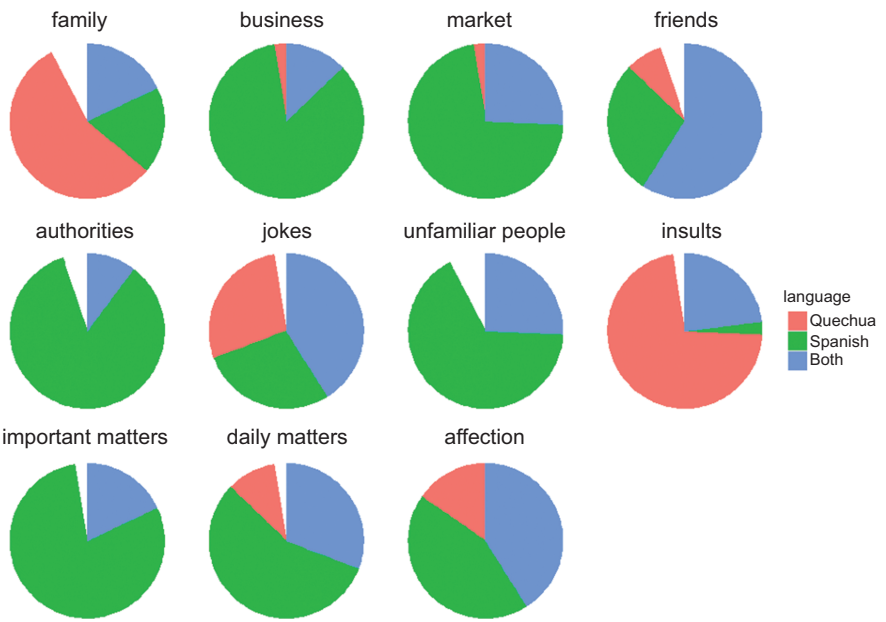

Figure 3: Responses from 39 bilingual speakers in Huari town regarding which language they would normally use in different communicative situations. White space indicates where not all 39 participants responded to a question.[10]

Figure 3 suggests that the use of Spanish dominates overall, in 7 of the 11 communicative situations asked about. It is especially prevalent in situations of social distance between speakers ("business", "authorities", "unfamiliar people"), commerce ("business", "market"), or to discuss important issues. Quechua, in contrast,

10 One speaker gave "English or French" as response to which languages they would use with unfamiliar people.

is dominant only in situations characterised by social proximity or expressive needs ("family", "insults"), but not all of them (cf. "affection"). It is notable that in a number of situations of daily life ("friends", "jokes", "daily matters", "affection"), a large share of the participants (a third or more) stated that they use both languages interchangeably. In fact, both languages were given as response by at least a quarter of all participants for 6 of the 11 situations, suggesting a functional equivalence between the two languages in these domains for them. In general, the results suggest that at the moment of recording, both Quechua and Spanish are healthy and that speakers are indeed in general functionally bilingual across a number of domains. However, it also seems likely that Spanish is slowly encroaching upon more of the communicative domains occupied by Quechua.

2.3 Short sociolinguistic profile of the speakers

This section gives an overview over some basic sociolinguistic characteristics only of those speakers whose data is analysed in this work. Overall, data from 27 speakers (9f, 18m, median age 21 years) was used. A short interview was conducted with each participant to obtain the sociolinguistic data. All information is thus based on self-description. At the time of recording, all speakers had their place of residence in Huari town. All speakers are bilingual[11] and fully literal in Spanish but do not read or write Quechua. Table 1 gives the identifier code for each speaker that is also used in each example in this work (column 1), together with their age at the time of recording (column 2), their sex (column 3), place of birth (column 4), level of education (column 9) and occupation at the time of recording (column 10). It also provides data about which of the two languages they first acquired (column 5), age of acquisition of the second language (column 6) and the response to two questions aimed at approximating a notion of which language the speakers are more dominant in or have a preference for.[12] They were *¿qué lengua te/le parece más fácil?* 'which language is easier for you?' (column 7) and *¿qué lengua utiliza(s) más?* 'which language do you use more?' (column 8). In columns 5, 7, and 8, „Q" stands for Quechua, „Sp" for Spanish, and „+" for both. Not all speakers gave the

11 Speaker QP44 very rarely speaks Quechua, but that seemed partially due to a social stance oriented towards a life outside the limits of Huari rather than lack of linguistic competence.

12 This is of course a bare-bones-approximation. A thorough assessment of the degree of bilingualism of the Huari speakers both individually and as a community is not possible on the basis of the sociolinguistic data presented here and it is also not the goal of this study. See Schmeißer et al. (2015); Treffers-Daller (2019) for a discussion of the complexities involved in defining and assessing language dominance in bilinguals.

same response to both questions, suggesting that they in fact capture slightly different aspects. It is notable that even though the first language for 20 of the 27 speakers is Quechua (about 75%, just as in the overall population according to the 2017 census), its share is far lower in response to both of these questions, with only 2 stating that it is the language they use more, and 6 that it is easier. In both cases, "both" is the most frequent response (14 both, 2 Quechua, 11 Spanish for „most used"; 10 both, 6 Quechua, 10 Spanish for „easier"), again overall indicating a fairly solid bilingualism both in these speakers and the community they come from. Clearly there is also some speaker-specific variation in the responses given here. It will however be seen in the analytical chapters that it is not a straightforward predictor of the prosodic variation observed there. The rightmost column in Table 1 gives the types of experiment corpora that were used in this study from each speaker. They are described in the following section. Bolder horizontal lines in the table above and below the data from two speakers indicate that they were dialogue partners in the dialogical tasks. All participants who were partners in tasks are either close relatives, spouses or friends, and volunteered for the experiments together, except for SG15 & QF16, who volunteered individually and were partnered by us.

2.4 Description of the experimental tasks

This section describes the communicative experimental tasks whose recordings are the production data forming the database for this work. For the dialogical tasks, speakers participated in pairs that stayed the same throughout all the tasks. Speaker pairs are marked by bolder horizontal lines in Table 1 in the previous section. Participants could choose which language to start in and first performed all of the tasks in one language and then in the other, with breaks whenever they chose. They were told to treat the tasks like communicative games and the overwhelming feedback they gave was that they very much enjoyed themselves, many saying they would like to come back and "play more games".

None of the tasks required reading, since speakers are not literate in Quechua (but all are in Spanish). Verbal materials used in the tasks were thoroughly checked and approved by native speakers, Leonel Menacho and Gabriel Barreto in the case of Quechua, and Raúl Bendezú Araujo in the case of Spanish. They appeared in the form of oral recordings in the tasks, spoken by Gabriel Barreto in Quechua and Raúl Bendezú Araujo and Gabriel Barreto in Spanish. The other type of material consisted in pictures of objects that occurred in different functions throughout the tasks. They were chosen so that the names of the objects depicted are controlled metrically, i.e. they systematically vary heavy syllables ((C)VC or

Table 1: Basic sociolinguistic characteristics of the speakers whose speech data is used in this study.

Speaker	Age[13]	Sex	place of birth[14]	L1	age of acquisition L2 (years)	easier L	most used L	education[15]	occupation	corpora[16]
NQ01	34	f	Huari	Sp	0–4	+	+	sec. ed.	housewife	Elqud
TP03	34	m	Huari	+	–	+	+	sec. ed.	municipal administrator	Conc, Maptask, Cuento, Elqud
KP04	29	m	Huari	+	–	+	+	sec. ed.	mechanic	Conc, Maptask, Cuento
QZ13	26	m	San Luis, CFF	Q	9–12	+	+	sec. ed.	food production technician	Conc, Maptask, Cuento, Elqud
OZ14	27	m	San Luis, CFF	Q	5–8	Sp	Sp	sec. ed.	food production technician	Conc, Maptask, Cuento, Elqud
SG15	36	f	Huari	Q	9–12	+	Sp	sec. ed. (3rd year)	cook	Conc, Maptask, Cuento, Elqud
QF16	50	m	Huari	Sp	0–4	Sp	Sp	sec. ed.	primary school teacher	Conc, Maptask, Cuento
LJ22	26	m	Huachis	Q	9–12	Sp	+	sec. ed.	technician	Elqud
AZ23	24	f	San Luis, CFF	Q	5–8	Sp	+	sec. ed.	university student	Conc, Maptask, Cuento, Quién
ZZ24	21	m	San Luis, CFF	Q	5–8	+	+	sec. ed.	university student	Conc, Maptask, Cuento, Quién, Elqud
MS27	20	f	Chavín de Huantar	Q	9–12	Q	Sp	sec. ed.	university student	Conc, Maptask, Cuento, Quién
CF28	22	m	Chavín de Huantar	Q	9–12	Sp	Sp	sec. ed.	university student	Conc, Maptask, Cuento, Quién

13 Age at time of recording in 2015, or 2017 if only data from the task *Elqud* by that speaker is used.

14 Refers to a district within Huari province if only a single name is given and to a district within a different province in Ancash if two names of the form "x,y" are given. "CFF" and "AR" stand for Carlos Fermín Fitzcarrald and Antonio Raimondi, respectively, two neighbouring provinces.

15 "sec. ed.", standing for "secondary education", here means that secondary education (from ages 12–18) was completed.

16 See next section for an explanation of the tasks.

ZR29	19	f	Huari	Q	9–12	Sp	Sp	sec. ed.	university student	Conc, Maptask, Cuento, Quién
HA30	19	f	Huari	Q	5–8	+	Sp	sec. ed.	university student	Conc, Maptask, Cuento, Quién
XU31	21	m	Huari	Q	13–16	Sp	+	sec. ed.	university student	Conc, Maptask, Cuento, Quién
OA32	21	m	San Nicolás, CFF	Q	13–16	+	Q	sec. ed.	university student	Conc, Maptask, Cuento, Quién
XQ33	20	m	Llamellín, AR	Sp	9–12	Sp	Sp	sec. ed.	university student	Conc, Maptask, Cuento, Quién
LC34	21	m	Huari	Q	0–4	Sp	Sp	sec. ed.	university student	Conc, Maptask, Cuento, Quién
CJ35	21	m	Huari	Q	9–12	Q	Q	sec. ed.	university student	Conc, Maptask, Cuento, Quién
KA36	20	m	Huari	Q	5–8	Q	+	sec. ed.	university student	Conc, Maptask, Cuento, Quién
OV37	16	m	Huari	Q	0–4	Q	+	in sec. ed.	student	Quién
AC38	16	m	Huari	Q	9–12	Q	Sp	in sec. ed.	student	Quién
SO39	16	f	Huari	Q	5–8	Q	+	in sec. ed.	student	Conc, Maptask, Cuento, Quién
MD40	20	f	Yauya, CFF	Q	5–8	+	+	sec. ed.	university student	Conc, Maptask, Cuento, Quién
QP44	25	m	Huari	Q	0–4	Sp	Sp	sec. ed.	university student	Elqud
XJ45	18	m	Huari	+	–	+	+	sec. ed.	university student	Elqud
ZE55	40	f	Llamellín, AR	Sp	5–8	n.a.	+	univ. ed.	housewife	Elqud

(C)V:) in any position in bi- and trisyllabic words in Quechua. Almost the same set of pictures was used for Spanish, chosen so that the intended words varied stress position. Words and candidate pictures were checked for their aptness to elicit the intended words with Gabriel Barreto before being used in the tasks. The different combinations of heavy and light syllables in Quechua did not yield the same number of easily depictable words, as (4) shows. In the tasks, speakers also sometimes spontaneously chose other than the intended words for the objects on the pictures.

(4) Intended Quechua words depicted by images of objects in the tasks, with heavy (**h**) or light (**l**) syllables
   a. **h.h** *ach.kas*[17] 'lamb'; *is.may* H.H 'excrement'
   b. **h.h.l** *aq.tsall.ku* 'hair of the corncob'
   c. **h.l** *all.qu* 'dog'; *an.ka* 'eagle'; *hir.ka* 'mountain'; *tsiq.tsi* 'bat'; *tsuk.lla* 'hut'
   d. **h.l.h** *pam.pa.kuy* 'funeral'; *ull.tu.kuy* 'tadpole'
   e. **h.l.l** *pin.ku.llu* 'type of flute'; *as.wa.na* 'clay vessel'
   f. **l.h** *a.ñas* 'skunk'; *a.tuq* 'fox'; a.rash 'lizard'
   g. **l.h.h** *ka.puq.yuq* 'wealthy person'
   h. **l.h.l** *cha.kall.wa* 'jawbone'; *na.ran.ha* 'orange'
   i. **l.l** *qa.qa* 'rock'; *ha.cha* 'tree'; *ha.ka* 'guinea pig'; *tsu.ku* 'hat'
   j. **l.l.h** *ha.tu.saq* 'giant, enormous'
   k. **l.l.l** *i.lla.pa* / *ti.lla.ku* 'lightning'; *pi.tsa.na* 'broom'

17 For the orthographic transcription of Quechua, I use the official alphabet for Peruvian Quechua varieties as set down by the *Resolución Ministerial* 12-18-85-ED from November, 1985 (cf. Cerrón-Palomino 2008: 70–71). The phonological values for its characters correspond largely to the ones in the IPA alphabet (International Phonetic Asssociation 2005), except in the cases of <ch>, <ll>, <ñ>, and <y>, that are adopted from Spanish orthography and therefore correspond to /ʧ/, /ʎ/, /ɲ/, and /j/, respectively. It uses only three vowel graphs <a>, <i>, <u> corresponding to the three vowels of Quechua. I follow this use except in the case of Spanish loanwords in which I sometimes use five vowels to make the word orthographically more recognisable to readers familiar with Spanish. The consonantal phonemes of Huari Quechua are /p b t d k g q t͡s t͡ʃ f s ʃ h m n ɲ r l ʎ w j/, with the voiced occlusives only occurring in loans from Spanish (adapting slightly from Parker 1976: 37–44). Quechua I varieties do not have the glottalized and aspirated occlusives of Cuzco Quechua (cf. section 3.2.1). Regarding actual phonetic realization, which is quite variable, each figure with a pitch track and spectrogramme of Quechua speech in this work contains a tier with a syllable-separated phonetic transcription following IPA alphabet conventions.

(5) Intended Spanish words depicted by images of objects in the tasks
   a. Proparoxytones *águila* 'eagle'; *murciélago* 'bat'; *relámpago* 'lightning'; *mandíbula* 'jawbone'
   b. Paroxytones *escoba* 'broom'; *gigante* 'giant'; *roca* 'rock'; *árbol* 'tree'; *choza* 'hut'; *naranja* 'orange'; *zorro* 'fox'; *zorrillo* 'skunk'; *lagartija* 'lizard'; *olla* 'pot'; *renacuajo* 'tadpole'; *perro* 'dog'; *montaña* 'mountain'; *choza* 'hut'; *cordero* 'lamb'
   c. Oxytones *maní* 'peanut'; *funeral* 'funeral'

Beyond those imposed by the instructions at the beginning of each task and the materials, there were no restrictions by the experimenters on the communicative behaviour of the participants during the tasks. Besides a role as game master in some of the tasks, the experimenters in general only interfered when participants had clearly misunderstood some of the instructions, or asked for help. In particular, no interference was made when speakers used other than the intended words for the game objects, or when they switched between languages. None of the tasks involved scripted speech, and all of the speech data used in this work can therefore be classified as at least semi-spontaneous. Raúl Bendezú Araujo and the author were present as experimenters in all of the tasks whose data is used in this work; with Raúl Bendezú speaking Quechua sufficiently to act as game master in some of them. The following describes the individual tasks. All the data from dialogical tasks (*Conc, Maptask, Cuento, Quien*) were recorded in 2015. Data from the pseudo-dialogical task *Elqud* was recorded in 2017.

Conc. Short for *concurso* "guessing game", and similar to the children's game *Memory*. Twelve picture cards chosen according to the metrical control were laid out in a grid on the table between the participants, face up. The participants had half a minute to memorize where each picture was, then the cards were turned face down. The speakers then took turns saying where which picture was, one at a time. They were not allowed to touch the setup or to use gestures, so that they had to use spoken language. After a guess, the game master confirmed that he had understood correctly and then turned over the card the speaker had indicated. If they had been right, they scored a point, the card was put aside, and the speaker was allowed to continue. If not, the card was turned face down again and it was the other speaker's turn. The game was over once all cards had been successfully identified.

Maptask. Map tasks are an established type of elicitation game (cf. e.g. Anderson et al. 1991; Grice & Savino 1997, 2003). In our version, the two participants were each given a map with pictures of objects whose names were controlled metrically. Only one participant's map had a path drawn between the objects. The task consisted in communicating so that the participant without the path was able to draw the correct path also on their map. Participants were not allowed to look at each

other's maps or to use gestures. The two maps were also different in that some of the objects were at different locations in them. The speakers were not told about this initially, so that solving the task necessarily included resolving the communicative conflict that would arise from the mixed-up locations. The game was over once the speakers had communicated the correct path successfully to their satisfaction.

Cuento. Spanish for "story", this task consisted of a version of the game *chinese whispers*. One of the participants left the room, and the other was played a recording of a short story containing many of the words chosen according to the metrical control. The stories were invented by the three experimenters and revised and read aloud by Gabriel Barreto for the Quechua recordings, and by Raúl Bendezú Araujo for the Spanish recordings. The participant could ask to have the recording replayed until they were confident that they remembered it. Then the other participant reentered the recording room, and the first participant told the story to them. After hearing the story and being free to ask anything about it, the second participant then told the story to the experimenters, while the first participant could help or correct them.

Quién. Spanish for "who", this is a task based on the game *who am I?*. The experimenters prepared four cards with names of people that they knew both participants to know (very famous people or people known personally to all involved), and one of the participants drew one of the cards in secret. The second participant then had to find out about the identity of the person on the card using any type of question, except for directly asking who it is via a wh-question, but with polar guessing questions like "Is it person x?" allowed. The first participant had to answer truthfully and to the best of their knowledge, without giving too much information away that wasn't directly asked for. The game was over once the person on the card had been correctly guessed or the second participant gave up.

Elqud. This is the only task whose data is used here that did not involve two participants, but only simulates utterances in a dialogical context. It uses a combination of visual and audio stimuli. Images or short animations were prepared that showed short situations or interactions between entities and objects. For each such situation, a corresponding audio was recorded (checked for acceptability and appropriateness and spoken for the recordings in both languages by Gabriel Barreto) that described the situation. In each of the experimental items, as opposed to the fillers, there was an intended discrepancy between audio and visual stimulus. The discrepancy was intended to correspond to different elements in the experimental items, e.g. a noun phrase corresponding to one of the figures in the visual stimulus ("the black dog"), a noun or adjective corresponding to an attribute of one of the figures ("the **white** dog"), a verb corresponding to an action or relation between the figures ("the dog **ate** the bone"), or also more complex parts of the audio stimulus corresponding to

similarly complex relations in the visual stimulus, such as double-topic constructions ("the **white** dog plays with the **blue** ball, the **black** dog plays with the **red** ball"). Participants were shown a visual stimulus and heard the corresponding audio stimulus. They were asked to treat the audio stimulus as a contribution by a dialogue partner about the situation shown by the visual stimulus, and to respond to this contribution, either by correcting it (in the experimental items), or by agreeing to it (in the fillers). They were asked to respond as expansively as possible in general (verbalizing as many of the elements shown), but otherwise not constrained in the form of their response, and no intervention was made when they responded elliptically or contrafactually. In total, 69 stimulus pairs (including 17 fillers) each were created for Quechua and Spanish, and speakers were shown them in two pseudo-randomized sequences, first in one language, then the other.

The data from the three dialogical tasks *Conc*, *Maptask*, and *Cuento* forms the empirical backbone of the analyses throughout this study. Data from *Quien* (in both languages) and *Elqud* (only Spanish) is used where indicated, in particular in sections 6.1.6. and 5.2., respectively.

2.5 Partial availability of the speech data used in the analysis

The *Conc*, *Maptask*, *Cuento*, and *Quien* speech data from speaker pairs TP03 & KP04, QZ13 & OZ14, AZ23 & ZZ24, ZR29 & HA30, XU31 & OA32, and XQ33 & LC34 in Quechua and Spanish has been published with annotation files and metadata, as Bendezú Araujo et al. (2019) and Bendezú Araujo et al. (2021), respectively. It is freely available online[18] for any interested party to be used non-commercially with attribution (creative commons licence CC BY-NC-SA 4.0).

2.6 General method

Overall, this study uses a mixture of qualitative and quantitative analysis. In all sections, the analytical argument is based on an in-depth knowledge of the data acquired through several years of study and by the author's having been present during all of the recordings. In some sections, the results are only exemplified using individual examples. Other sections also employ quantification where possible, and occasionally also inferential statistical analysis.

18 At https://refubium.fu-berlin.de/handle/fub188/25747 and https://refubium.fu-berlin.de/handle/fub188/29497, respectively. Note that *Conc* is called *Memoria* in the published data.

2.7 Acoustical analysis, visualization and statistics

Acoustical analyses of the data were conducted in *praat* (Boersma & Weenink 2020). Scripts for the automatic extraction of measurements were written by the author, partially based on routines taught by Rafèu Sichel-Bazin. For the generation of pitch track, oscillogramme, and spectrogramme images used for the examples, a slightly customized version of the script *Create Pictures* (Elvira-García 2017) was used with a voicing threshold of 0.6 if not otherwise noted. Occasionally, pitch movement due to consonantal microprosody or background noise was manually removed. Statistical analyses were conducted in *R* (R Core Team 2020) using *Rstudio* (RStudio 2009–2020). Plots from *R* were produced using *ggplot2* (Wickham 2016). Further *R* packages are cited in those sections for whose analysis they were used. Individual sections also contain further specific methodological descriptions.

2.8 A short note on examples

Each Huari Spanish and Quechua example with a pitch track as well as each longer context example appearing in this study has a corresponding audio file hosted online via the Open Science Framework (Foster & Deardorff 2017) and published open access under creative commons license CC BY-NC-SA 4.0, at https://doi.org/10.17605/OSF.IO/MAH8Z (Buchholz 2021a). In electronic versions of this document that are hyperlink-compatible, the audio file is accessible via the weblink in a separate footnote for each pitch track or example.

Appendix **A** also lists the stable URLs for all audio files so that they can be accessed in document formats without hyperlink compatibility. In the text, examples are given a code, which is to be read as follows: *speaker_task_language_start time*, e.g. KP04_Conc_Q_1653 meaning that the example is by speaker KP04, from the *Conc* task in Quechua, starting at 165.3 seconds from the beginning of the recording of the task.