Article

Typological Shift in Bilinguals' L1: Word Order and Case Marking in Two Varieties of Child Quechua

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Abstract: We compare speech production and find morphosyntactic change among children and adolescents speaking two closely related varieties of Quechua in Cuzco, Peru, and Chuquisaca, Bolivia. Quechua languages traditionally employ Object-Verb (OV) word order in main clauses, but robust case marking permits other orders, especially to focalize new information through constituent fronting. In Chuquisaca, but not Cuzco, we find that schoolchildren often omit the accusative suffix *-ta* from direct objects while retaining a prosodic trace of *-ta*. In other varieties, loss of accusative marking is associated with a shift towards Verb-Object (VO) word order, as in Spanish. However, we find that Chuquisaqueños use more canonical OV and possessor-possessed order in declarative sentences than do Cuzqueños, who employ a wide range of word orders at the sentence level and deviate from the possessor-possessed norm for Quechua noun phrases. Our finding of more rigid word order in Chuquisaca highlights the complex factors contributing to typological shift in word order and morphology: Omission of case morphology places a greater burden on word order to identify grammatical roles. Further, we find that Chuquisaqueño schoolchildren alone have begun to use *huk*, "one," to mark indefiniteness, perhaps to replace determiner-like functions ascribed to *-ta* and to obsolescent markers such as evidentials.

Keywords: Quechua; bilingualism; morpho-syntactic change; word order typology; first language acquisition; language shift; endangered languages; convergence

1. Introduction

How does learning a second language affect the first language of its speakers, particularly when the L1 is an endangered language? This question is of crucial importance to a variety of people, especially parents who want their children to maintain communication with elders and ancestors, but also educators, who recognize the intellectual value of a strong mother tongue, and linguists, who understand that diversity of datasets is needed to build adequate theories of language acquisition and change. Endangered languages are often the last to be considered when building a linguistic theory, and the least known when building a language curriculum. This paper directs attention towards the changing grammar of an endangered first language, highlighting the interwoven nature of word order and morphological type.

Here we employ insights from the fields of language typology, functionalism, and minimalism in order to make sense of the differences emerging in two closely related languages: the varieties of Southern Quechua spoken in the rural highlands of Cuzco, Peru, and Chuquisaca, Bolivia. Little published documentation exists on contemporary child speech of either variety. Rather, in studies of Andean child language it is more common to look at the second language, Spanish, spoken by Andean children; see for example Luján et al. (1984), who study the effects of Quechua word order on Peruvian children's L2 Spanish. The current study analyzes a published corpus of structured interviews

involving oral comprehension (picture selection) and production (picture description) gathered among 104 children and adolescents ages 5–15[1] in both regions (Kalt 2009b).

Several studies of the Quechua language family have made strong claims regarding the mechanisms and outcomes of changes to the language due to internal forces and to its contact with Spanish. Hintz (2009, 2016) has claimed that an increase in verbal periphrasis and decrease in verbal suffixes shows that the language family as a whole is becoming more isolating, like Spanish, and less polysynthetic or agglutinating than it was in the past. Sánchez (2003, 2004) has claimed that the emergence of determiners and decrease in nominal suffixation correlates with a shift to Subject-Verb-Object (SVO) word order, again like Spanish and unlike the way it was spoken in the past, which was predominantly Subject-Object-Verb (SOV). Other studies by Dankel and Soto Rodríguez (2012), Muntendam (2015), and Albarracín de Alderetes (2016) seem to support these claims while illuminating social and pragmatic factors. The most important contribution of the current study is to demonstrate that, even within closely matched varieties of Quechua, small differences are emerging that ultimately may create greater divergence. Change in a speaker's first language is not entirely predictable, nor is it based solely on grammatical properties or the relative social status of the L1 and L2 in contact.

The findings reported here confirm that Quechua is changing in both regions: In rural Cuzco, schoolchildren use a higher percentage of SVO and possessed-possessor word order than what is expected in traditional grammars of Quechua, and more like the order presented in standard grammars of Spanish. In rural Chuquisaca, schoolchildren use a higher percentage of constructions with dropped accusative case-marking and indefinite determiners than in traditional grammars. Sánchez (2003) has found that the latter phenomena coincide with a shift from SOV to SVO word order in Lamas, and Hintz (2009, 2016) has found that changes in word order correlate with more periphrasis and more isolating morphology, but our study points in the opposite direction: The variety with a high incidence of dropped morphological case-marking and emergence of indefinite determiners is also the one with significantly more OV word order and canonical possessor-possessed word order. Thus, we have a significant puzzle to solve.
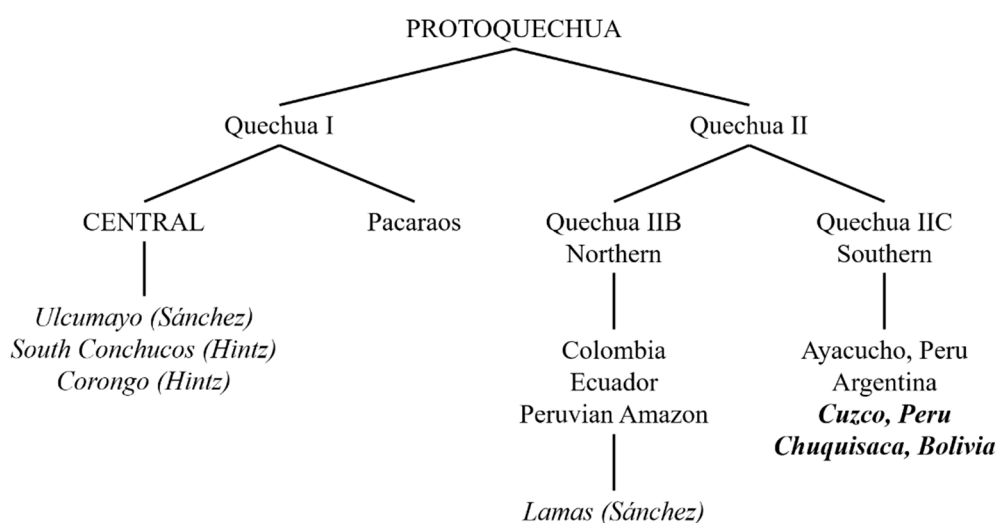
In sum, this study explores the differences emerging among two closely related varieties of a single endangered language, Southern Quechua (IIC in Torero's 1964 and Parker's 1963 taxonomy). We compare word order and morphological marking in sequential bilinguals' South Bolivian Quechua (quh) and Cuzco Quechua (quz), their respective first languages, and consider what these tell us about language acquisition and change. Our objective is to explore understudied languages and illuminate changes to L1 Quechua (que) produced by prolonged contact with L2 Spanish (spa). Processes of change here have implications for explanations of language variation, acquisition, and change as a whole, especially with regards to how tight the relationship is between word order and morphological type.

This article is organized as follows: First, we present an overview of our two chosen varieties of Southern Quechua and what is known about their pre-history, history, and social status; second, a review of the general properties of Quechua and Spanish relevant to this study. Third, we summarize previous experimental work on contact-induced change in Quechua and theories put forth by Hintz (2016) and Sánchez (2003) to explain their results. Fourth, we state our hypotheses and experimental study. Finally, we present our experimental findings, conclusions, and next steps.

2. Overview of Southern Quechua in Cuzco and Chuquisaca

The Quechua language family divides into two major branches, as identified by Torero (1964) and Parker (1963). Figure 1 is simplified from Cerrón-Palomino (1987, ch. 8) with superimposition of the languages explored in the corpus studied here plus those discussed by Hintz (2009) and Sánchez (2003).

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[1] Henceforth, we refer to the entire group as "schoolchildren" for the sake of brevity.

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                           PROTOQUECHUA

                Quechua I                         Quechua II

        CENTRAL      Pacaraos      Quechua IIB          Quechua IIC
                                    Northern             Southern

    Ulcumayo (Sánchez)              Colombia          Ayacucho, Peru
    South Conchucos (Hintz)         Ecuador             Argentina
    Corongo (Hintz)               Peruvian Amazon      Cuzco, Peru
                                                    Chuquisaca, Bolivia

                                  Lamas (Sánchez)
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Figure 1. The Quechua language family and varieties from the studies mentioned. Bold italics indicate those under current study; other varieties studied by Sánchez (2003) and Hintz (2009) are simply italicized.

Linguists believe that the family originated in Central Peru or on the adjacent coast, in part since the greatest diversity is represented in the smallest geographical area there (Torero 1964; Parker 1963; Mannheim 1991). On the other hand, the largest number of speakers is found in the Southern Quechua branch, which also coincides with the variety spoken by the rulers of the Inca Empire at the time of the Europeans' first arrival. Cuzco, the former Inca capital, is the name most often associated with Southern Quechua, which is spoken in southern Peru, Bolivia, and northern Argentina by approximately 1.6 million speakers (Eberhard et al. 2019).

Rural highlands Chuquisaca remains one of the few places in Bolivia where Quechua dominance and even a degree of monolingualism may be found. According to Kalt (2016, p. 1):

> Chuquisaca, Bolivia lies near the southern extreme of the linguistic area that produced Standard Colonial Quechua (quz/quh). Movement among people there was reinforced through one of the world's major silver mining circuits of the 16th century. Cuzco Quechua is the prestige variety which has been documented for over 500 years, whereas Bolivian varieties have rarely received attention (Durston 2007; Mannheim 1991). Quechua is now 'definitely endangered' in this region as intergenerational transmission is increasingly abandoned in favor of Spanish.

In order to correctly interpret the data in the corpus studied, we consulted a number of references regarding basic facts about Southern Quechua, including the classic contemporary reference on Cuzco Quechua (Cusihuamán Gutiérrez 1976) and a more general compendium (Cerrón-Palomino 1987). When comparing Cuzco Quechua with varieties spoken in Bolivia, van de Kerke (1996) was indispensable. The Chuquisaca variety is described in a pedagogical grammar by Stark et al. (1971) and in a dictionary completed by Bolivian linguist Plaza Martínez (2015), which includes contributions from two rural Chuquisaca farmers. Vargas Melgarejo (2019) explores causes and linguistic effects of migration from countryside to town in Chuquisaca and attitudes towards the L1 Quechua, whereas Laime Ajacopa (2014) focuses on pragmatics in the same region. Other contemporary studies consulted include Cordero Céspedes and Cruz Agudo (2013), who look at the variety from nearby Valle Alto, Cochabamba, and Peralta Zurita (2006), who studies the variety from Yambata, Norte de Potosí, also nearby. Most other studies of Bolivian Quechua relate to the varieties spoken in and around Cochabamba, (e.g., Lastra 1968; Bills et al. 1971; Herrero and Sánchez de Lozada 1978; Muntendam 2015), an area where simultaneous bilingualism is anecdotally more prevalent than the sequential bilingualism of the

communities studied here. We discuss the sociolinguistic situation of these communities further in the next section.

2.1. Factors Determining Quechua Language Variation

Mannheim (2018) establishes three axes crucial to variation among Quechua languages: variation due to regional distancing, to contact with other indigenous languages, and to differences in social register.[2] Before embarking on a comparative study, it is worth examining to what degree we are comparing groups matched along each axis. In terms of regional distancing, the communities studied are divided by about 1500 miles of high mountains and desert plains as well as a national boundary established in the early 1820s. Despite this extreme distance, the languages they speak are mutually intelligible today (our field observations; Urton 1997, pp. 10–11). They have a shared prehistory: Nearby communities in both regions were originally peopled by the Yampara ethnic group, which is believed to have spoken the now extinct Puquina language before Quechua (Barragán Romano 1994; cf. in Laime Ajacopa 2014, p. 27); for more on traces of Puquina in Quechua see Cerrón-Palomino (2020). In terms of contact with other indigenous languages, people in both regions would have had a complex history of contact with Aymara (Cerrón-Palomino 2008) and perhaps with the Amazonian languages in their neighborhood, most likely Arawak via its influence on Puquina (Adelaar 2020).

Importantly, according to Mannheim's criteria, communities in the two regions have a similar social standing and are not speakers of an elite register of Quechua. Both countries underwent agrarian reform and began extending formal education and, occasionally, bilingual education in rural areas during the 20th century. Since the arrival of formal education to the countryside, children in these communities traditionally were immersed in Spanish for the first time upon entering school. Four rural schools were selected for participation in the establishment of a corpus based on having been identified by the respective regional and local education authorities as communities where Quechua predominated and in which some form of native language education was being attempted. All participants lived in rural agro-pastoralist communities of less than 120 households, located at least six miles from the nearest town or city. The handful of adults interviewed were community leaders who resided there and held office on a rotating basis, usually lasting a year or more. When asked, "Who speaks Spanish to you at home?," some children mentioned adults or siblings, but 73.5% of participants in Chuquisaca (36/49; an additional fiftieth child was not asked this question) and 55.6% of those in Cuzco (30/54) indicated no one. Thus, the probability of participants coming from a monolingual household was higher in Chuquisaca than in Cuzco. Community leaders in both places indicated that Quechua was the only language spoken in the fields. Churches, offices, fairs, and stores were located outside the communities and were identified as bilingual spaces by leaders. Frequency of temporary migration data were not collected in 2009, but in subsequent years community leaders indicated that families increasingly were moving to urban centers to access better education and living standards, while maintaining a home in the rural community. The Spanish spoken in schools by teachers was often heavily influenced by the teachers' own experience of having at least one Quechua-speaking parent, and rural teachers generally were city residents who commuted to the rural communities and lived on school grounds during the week (Kalt 2012b).

Because interviewees in the corpus are matched along Mannheim's three axes, we conclude that any divergent characteristics of the Cuzco and Chuquisaca varieties will most likely not be due to fundamental differences in exposure to a particular variety of Spanish, nor to social standing and register, nor to original pre-history and contact with other indigenous languages, but instead to internal developments in each L1 in complex relation to the L2. The current study probes the sources of these divergent developments and

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[2] In fact, Mannheim refers to "regional diversification" and "enregisterment," which for our purposes are simplified to "regional distancing" and "social register."

sharpens our notions of the interwoven roles of word order and degree of polysynthesis as both cause and effect of such development. The word "interwoven," used by Hintz (2011) to describe complex and overlapping semantic phenomena, is apt here for two reasons: First, weaving is a primary activity and art form among the communities studied, and second, the notion of weaving captures the difficulty, if not impossibility, of disentangling phenomena that are in constant interdependence with one another.

3. Overview of Properties of Quechua and Spanish Relevant to This Study

It is useful to begin this discussion by observing the most basic typological differences between the speakers' L1 Quechua and their L2 Spanish. For this purpose, we locate Quechua and Spanish by types, or macroparameters in the sense of Baker (1996), and relate these types to the theory that all human languages have certain core tendencies that unite them under the surface and make acquisition possible. Linguists working within different frameworks share this assumption.

Baker (1996, pp. 4–5) follows Greenberg (1963) and Nichols (1986, 1992) in observing that the world's languages cluster under three basic morphological types: isolating languages such as English, dependent-marking languages such as Japanese, and head-marking languages such as Mohawk (Table 1). These morphological types roughly correlate with word order types: Isolating languages tend to be head-initial, with order SVO; dependent-marking languages tend to be head-final, with order SOV; and head-marking languages tend to exhibit free word order. Baker further finds that there are some "stable compounds" of languages that display hybrid properties (Baker 2001, ch. 5). Spanish and Quechua are both hybrids that coincide in their relatively free word order, as well as rich subject and object inflection marking on verbs. Both languages also allow null subjects. Since Spanish and Quechua display hybrid properties, neither one could be considered to represent a particular prototype. For example, both tend toward free word order, but Spanish tends to be head-initial and Quechua tends to be head-final. Likewise, both languages mark case on phrasal heads, but Spanish tends to be more isolating, having more free-standing words, whereas Quechua tends to be more dependent-marking, concentrating more resources in suffixes on nominal constituents.

Table 1. Typology of the world's languages. Chart adapted from Baker (1996, pp. 4–5), with Spanish and Quechua superimposed in italics.

Morphological Type	Isolating	Dependent-Marking	Head-Marking
Word order type	Head-initial	Head-final	Free
Exemplar	English	Japanese	Mohawk
	Spanish		*Spanish*
		Quechua	*Quechua*

3.1. Morphological Properties

Following its dependent-marking nature, Quechua employs a possessive suffix and post-positional suffix *-pi*, "in," to indicate constituent structure of a noun phrase, whereas a free-standing possessive adjective and preposition *en*, "in," modify the semantically equivalent noun phrase in Spanish, as shown in examples 1 and 2.[3] Note that it generally takes more words to express the same meaning in Spanish than it does in Quechua.

1. Wasi-y-pi   hampi-wa-chka-n-mi
   house-1POS-LOC   cure-1OBJ-PROG-3-DIREV
   "(I can testify that) He/she is treating me in my home."

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2. | Me | está | cur-ando | en | mi | casa |
   |----|------|----------|-----|-----|------|
   | 1OBJ | is | cure-PROG | in | 1POS | house |

   "He/she is treating me in my home."

Examples 1 and 2 above demonstrate that both Spanish and Quechua are head-marking languages. Here they display obligatory object person markers on verbs; in these examples, the conjugated verb is also sufficient to identify a null subject.

Example 3 below illustrates that third person object suffixes, which are marked overtly in first and second person, are phonologically null, and are interpretable as ±definite and ±specific.

3. Yanapa-chka-**Ø**-nki
   help-PROG-**3OBJ**-2
   "You are helping him/her/someone."

As a dependent-marking language, Quechua relies heavily on morphological case to identify thematic roles and distinguish subjects from objects. Nominative case is null, but the accusative marker *-ta* is used for direct objects of transitive verbs. This marker is also used to identify goal arguments of intransitive verbs and sometimes to mark paths of movement in combination with a possessive suffix. The dative marker *-man* marks indirect objects. Examples from Cusihuamán Gutiérrez (1976) with our adapted spelling, glosses, and translations are found below: 4 contains a direct object of a transitive verb marked with *-ta*, 5 contains a goal marked with *-ta*, and 6 contrasts with 5 by marking the goal of an intransitive verb with dative *-man* and the path with *-ta*.

4. | Chay | wawa-cha-**ta** | puñu-ya-chi-y! |
   |------|------------------|----------------|
   | that | child-DIM-**ACC** | sleep-INT-CAUS-IMP |

   "Make that child go to sleep!"

5. | Haku-chu | llaqta-**ta** |
   |----------|---------------|
   | go-INTRR | town-**OBJ** |

   "Shall we go to town?"

6. | Abankay-ni-n-**ta**-m | carretera-qa | ri-chka-n | Andawaylas-**man**-qa |
   |------------------------|--------------|-----------|------------------------|
   | Abancay-EUF-3POS-**OBJ**-DIREV | road-TOP | go-PROG-3 | Andahuaylas-**DAT**-TOP |

   "The road to Andahuaylas passes through Abancay."

Despite the fact that *-ta* can mark both direct and indirect objects, it leaves no doubt that the constituent marked is not a subject. For this reason *-ta* is sometimes glossed as an "objective" case marker when it is not explicitly accusative. Accusative *-ta* is sometimes omitted in monolingual contexts, although we are not aware of baseline corpus studies establishing its distribution. This suffix is also used to mark adverbs. We will not discuss Spanish objective case marking here, but simply note that the preposition *a* is its primary vehicle, in combination with doubling by a pronominal object clitic selected from an accusative or dative paradigm and attached immediately to the left of the tensed verb or to the right of a verb unmarked for tense (Torrego 1998). Comparisons of Quechua and Spanish object marking are further detailed in Kalt (2002) and Sánchez (2003).

3.2. Word Order in Main Clauses

The canonical word order for Quechua main clauses with neutral interpretation is SOV. Examples 7–9 are adapted from Cerrón-Palomino (1987, pp. 289–90).

7. | Luwis | tanta-ta | mikhu-chka-Ø-n |
   |-------|----------|-----------------|
   | Lewis | bread-ACC | eat-PROG-3OBJ-3 |

   "Lewis is eating bread."

According to Cerrón-Palomino, other possible orders for the same sentence with no change in basic meaning include OSV, OVS, SOV, VSO, and VOS. This relatively free word order in main clauses becomes rigid OV in subordinate clauses.

Pragmatic function may influence word order in main clauses. The Quechua languages, like their Aymara and Amazonian neighbors, generally identify the speaker's source of information and/or the speaker's evaluation of or relationship to the proposition presented. Focus (or the encoding of new information) is usually marked in Cuzco

Quechua with the addition of an evidential morpheme that expresses the notions above. Focused elements are often moved leftward in order to become more salient, as in example 6 above and in 8–9.

8. Tanta-ta-**m**				Luwis				mikhu-chka-Ø-n
    bread-ACC-**DIREV**		Lewis				eat-PROG-3OBJ-3
    "It is **bread** that Lewis is eating."

In example 8 above, the evidential morpheme indicating that the speaker has direct evidence for the assertion is attached to the object, focalizing it. The object has also moved ahead of the subject, so the resulting order is OSV.

9. Mikhu-chka-Ø-n-**mi**				tanta-ta				Luwis
    eat-PROG-3OBJ-3-**DIREV**		bread-ACC			Lewis
    "Lewis is **eating** bread."

In example 9 above, the verb has also moved in front of the subject, adding emphasis to it and producing the order VOS.

In summary, Cerrón-Palomino demonstrates that canonical word order for Quechua sentences is SOV. In simple, declarative sentences, word order is relatively free. Evidential morphemes and constituent fronting are used to mark new information in main clauses and produce a variety of possible orders. These basic facts are also found in Cusihuamán Gutiérrez's (1976) study of Cuzco Quechua and are examined extensively in studies by Sánchez (2004, 2010), which explore pragmatics and morpho-syntax of South Peruvian varieties within a minimalist framework.

3.3. Word Order at the Phrase Level in Quechua

Word order at the phrase level is represented in the following schema, which corresponds to typical head-marking behavior:

   Adjectives precede nouns
   Possessors precede possessed nouns
   Verbs precede auxiliaries
   Subordinate clauses precede matrix clauses
   (Cerrón-Palomino 1987, p. 290)

Examples of the canonical possessor-possessed order in Quechua are offered below: Quechua: ownership (alienable possession) order possessor-possessed

10. qan-pa				alqu-yki
    you-GEN				dog-2POS
    "your dog"

Quechua: part-whole relationships (inalienable possession) order possessor-possessed

11. waka-q				chaki-n
    cow-GEN				foot-3POS
    "the cow's foot"
    (Cusihuamán Gutiérrez 1976, p. 147)

Possessive phrases in Spanish exhibit the opposite word order, although the picture gets more complicated when inalienable possession or part-whole meanings are expressed, with the intervention of pronominal clitics. In either context, however, the expected order for the non-pronominal possessor noun in peninsular Spanish is after the possessed noun. Spanish: ownership (alienable possession) order possessed-possessor

12. José		agarró		el		sombrero		de		María
    José		grabbed		the		hat			GEN		María
    "José grabbed María's hat."

Spanish: part-whole relationships (inalienable possession) order possessor-possessed

13. José		le		tocó		el		brazo		a		María
    José		3OBJ		touched		the		arm		to		María
    "José touched María's arm."

In summary, possessors precede possessed nouns in traditional grammars of Quechua, whereas the opposite order prevails in standard varieties of Spanish. Comparison of possessive constructions in Spanish and Quechua is developed further in Camacho et al. (1995), Kalt (2002), and Sánchez (2003); all of these works describe Quechua-influenced changes to L2 Spanish in possessive constructions.

3.4. Contrasts in the Specification of Nouns in Quechua and Spanish

In Spanish, non-generic nouns do not appear without a determiner. The features spelled out by Spanish determiners are diverse and include discourse features (±definite/specific), categorial features of gender (±female), and features related to exponence or number (±singular). Thus, Spanish has a set of 2^3 or eight determiners corresponding to all possible values of the paradigm in Table 2.

Table 2. Spanish determiner paradigm.

+Singular	+Female	−Female
+definite	*la*	*el*
−definite	*una*	*un*
−Singular	**+Female**	**−Female**
+definite	*las*	*los*
−definite	*unas*	*unos*

In traditional varieties of Quechua, grammatical gender does not exist and number is marked only loosely. Definiteness and specificity are deduced from context and from the cumulative interpretation of other suffixes in a sentence. Expression of any or all of the determiner-related features that are obligatory in Spanish are optional in Quechua: Generic is the default interpretation of nouns in utterances unmarked for tense, aspect, or evidentiality (Mannheim et al. 2010). The following examples adapted from Mannheim et al. (2010) illustrate this claim:

14. Waka q'achu-ta mikhu-n
    bovine forage-ACC eat-3
    "Cows eat forage."

15. Waka-qa q'achu-ta mikhu-chka-n wata-na-n-pi
    bovine-TOP forage-ACC eat-PROG-3 tie-NOM-3POS-LOC
    "The cow is eating forage at its hitching post."

In traditional Quechua grammars, *huk*, "one, other," is not interpreted as an indefinite determiner but rather as an adjective. Definiteness and specificity are sometimes expressed in pre-nominal adjective phrases, as in the following examples:

16. **Hatun** llama-ta qhawa-chka-ni
    big llama-ACC watch-PROG-1
    "I am watching a/the big llama."

17. **Huk** llama-ta qhawa-chka-ni
    one/other llama-ACC watch-PROG-1
    "I am watching one/another/the other llama."

4. Previous Experimental Studies of L1 Development of Quechua Word Order, Morphological Marking, and Interpretation

General studies investigating L1 acquisition of Cuzco Quechua morpho-syntax include Courtney (1999, 2002, 2006, 2008, 2010, 2015), Courtney and Saville-Troike (2002), and Mannheim et al. (2010). Courtney's (1999) findings include the following observations on morphology and word order, as summarized by Sánchez (2003, p. 56):

1. Accusative case-marking is robust in Quechua first-language acquisition, except with Spanish loanwords.
2. Accusative case-marking is acquired prior to direct object verbal morphology.

3. Final subjects are frequent at early stages of acquisition. There is no evidence of a preference for SVO word orders in early Quechua acquisition.
4. For one child, subject agreement morphology preceded object agreement morphology.

Mannheim et al. (2010) study how rural child speakers interpret generic noun phrases, since there is no overt linguistic marking to distinguish generic from indefinite utterances. They find that generic interpretations are found among the youngest speakers and "may be a default mode of quantification" (Mannheim et al. 2010, p. 1). They compare their findings to similar studies of English and Mandarin. Of interest to our study is the finding that generic interpretations are available from the earliest ages in Quechua, as distinct from words marking indefiniteness such as "some." They also found that linguistic markers cueing specificity were more powerful in influencing children's interpretations than the animacy status of the noun in question.

4.1. The Mechanism of Change in Hintz's Work on Verbal Periphrasis

Hintz (2009, 2016) looks at processes of grammaticalization and auxiliation proposed for many world languages. His work is not experimental and not specific to children, but rather focuses on mechanisms of change that can be deduced from careful comparisons of examples across historical and regional usage. Hintz hypothesizes that, independent of external influences, there is a cycle of grammaticalization in Quechua in which aspectual auxiliaries fuse with adjacent nominalizers to produce new suffixes, and a cycle of auxiliation in which free-standing verbs come to express new aspectual meanings. This oscillation leads to a steady new supply of native suffixes and native auxiliaries within the language over time. Crucially, an interruption in the cycle can be brought about by a change in word order among the elements.

Word order change is a necessary condition for the suppression of suffix creation as well as for the acceleration of the production of new auxiliaries in Quechua, as Hintz painstakingly illustrates with many examples taken from around the language. This change is brought about by the influence and adoption of Spanish word order in verb phrases with an aspectual nominal expression, as contrasted with the native order in examples 18–19 below.

18.	Native Quechua order	Puñu-q	ri-ni
		sleep-NOM	go-1
		"I will be asleep."	Santiago del Estero Quechua
		VERBSTEM-NOMINALIZER	AUXILIARY-INFLECTION
19.	Spanish-influenced order	Ri-ni	puñu-q
		go-1	sleep-NOM
		AUXILIARY-INFLECTION	VERBSTEM-NOMINALIZER

In the instance given in example 18 above, a non-compositional interpretation has already developed for this phrase in Santiago del Estero, an Argentinian variety of Quechua.

Hintz points out that reversing the order of the nominalized expression *puñuq*, "asleep," and the auxiliary verb *ri-ni*, "I go," as in 19 results in the inflectional suffix *-ni* coming between the nominalizer *-q* and the auxiliary verb *ri*. This intervening material, which can vary, prevents the cycle in which *-qri* would eventually fuse with new compositional meanings. In Hintz's theory, the frequent co-occurrence of the nominalizing suffix and auxiliary that follows sentences such as 18 leads eventually to the fusion and the formation of new suffixes such as *-qri* with the meanings INCHOATIVE, INGRESSIVE, FUTURE, and PUNCTUAL attributed to it for different varieties where it has been discussed in the literature (Hintz 2009, p. 197). However, where speakers have adopted a Spanish-influenced order, as in 19, no such fusion can occur. Instead, speakers become accustomed to expressing aspectual meanings through a proliferation of new auxiliary verbs.

We summarize Hintz's work by noting that the interruption of suffix renewal (decline in production of new suffixes) and the proliferation of auxiliary constructions to express verbal aspect are each part of the mechanism of change. Contact-induced word order shift within aspectual verbal constructions is a catalyst for this change. Due to the cyclical nature

of the processes described by Hintz, word order change is both a cause and effect of the decline in agglutinative morphology in bilingual varieties of Quechua.

4.2. Sánchez's Theory of Functional Convergence in Bilingual Quechua-Spanish

Sánchez (2003) presents a groundbreaking and detailed study of contact-induced changes to both Quechua and Spanish, in which she operationalizes the generative view that language acquisition involves the specification of features within functional categories; the mechanism of change in both L1 and L2 is functional convergence, defined as follows:

> The specification of a common set of features shared by the equivalent functional categories in the two languages spoken by a bilingual, takes place when a set of features that is not activated in language A is frequently activated in language B in the bilingual mind. (Sánchez 2003, p. 15)

Furthermore, not only equivalent functional categories undergo such changes, but also new categories may emerge that are not present in monolingual varieties.

Sánchez's theory offers a mechanism by which two typologically different languages with radically different distributions of structural and semantic properties might adopt common representations of certain types of utterances, leading to convergent forms of expression. The notion of convergent specification of roughly equivalent categories is used to explain changes in word order in both Spanish and Quechua. Linguists have posited an abstract position in each language where discourse features such as focus and speaker perspective are interpreted (Sánchez 2003, ch. 2; van de Kerke 1996, p. 168). They have also posited a Clitic Phrase above the verb in Spanish; Sánchez finds instances of Spanish clitics on Spanish verbs in some simultaneous bilingual schoolchildren's Quechua narratives (Sánchez 2003, pp. 93–96). Changes in feature specification related to focus marking and clitics might lead to more verb-fronting in Quechua, leading to the production of more SVO sentences. Sánchez uses the notion of the emergence of new categories to explain the rise of determiners in a position previously occupied only by adjectives in Quechua, and in particular, a new indefinite interpretation for the word *huk* in that position.

5. Statement of Our Experimental Hypotheses

Prior to examining the data, our null hypotheses are that (a) schoolchildren who speak Cuzco and Chuquisaca Quechua have the same grammar as each other and (b) as that of adults mentioned in the grammatical sketch presented above. These hypotheses are based on idealizations of grammar because a comparable, tagged baseline corpus of adult speech for either region is not yet available. Nevertheless, we state them in the strongest possible terms so as to make the initial results interpretable.

These hypotheses are examined in terms of:

1. Word order in simple declarative sentences (SOV is expected, with allowances for the fronting of focused elements);
2. Word order in possessive phrases (the order possessor-possessed is expected);
3. Use of accusative markers (we expect *-ta* on nouns to distinguish objects from subjects in main clauses; subjects have no overt case marking. *-ta* may also mark goals and paths; *-ta*-marked objects must be further distinguished from adverbs); and
4. Use of determiners (no determiners are expected to exist; instead, adjectives, demonstrative pronouns, and numbers precede the nouns they modify).

To reject null hypothesis (a), we must find significant differences between schoolchildren's utterances in Cuzco and Chuquisaca. To reject null hypothesis (b), we would expect changes in Cuzco and Chuquisaca, perhaps similar to those found by Hintz and Sánchez: Based on Hintz' findings for South Conchucos and Corongo Quechua (Hintz 2009), and the Quechua language family in general (Hintz 2016), we predict that if the language is becoming more isolating in the verbal domain through the suppression of verbal aspectual suffix renewal and the creation of aspectual auxiliary verb constructions, it might also become more isolating in the nominal domain through the suppression of case markers or other

suffixes that attach to nouns, and the creation of nominal particles such as determiners to express some of the features formerly carried by those suffixes, including ±definiteness. This would assist speakers with distinguishing between generic vs. non-generic nouns.[4]

Based on Sánchez's (2003) findings about Lamas and Ulcumayo Quechua, we further predict that prolonged and extensive contact with Spanish will lead to more SVO word order, loss of accusative marking, and emergence of indefinite determiners such as *huk*. Since Lamas is a Quechua IIB variety and Cuzco-Chuquisaca is IIC, this study tests how closely the evolutionary paths of these genetically related varieties resemble each other.

6. Methodology

The child interview data considered in this study are published at the Archive of the Indigenous Languages of Latin America (AILLA) (Kalt 2009b) and are available from the depositor. We have further tagged the sentences in the corpus for word order (see Section 7.1). The elicitation instrument was a picture selection and description task, adapted first for Andean Spanish and later for Peruvian and Bolivian Quechua from Deutsch et al. (1986) (Kalt 2002, 2012b) (see Appendix A for sample stimulus sentences and a sample picture set). During pre-task administration, a single child sat with a native-speaker interviewer, who introduced a pair of characters named Ana and José and invited the child to point at the picture that corresponded to one of the characters. On the next page, they were presented with a set of three pictures and the interviewer uttered a sentence and asked the child to point at the corresponding picture. At this point the task itself began, with 14 pages of closely matched pictures, three to a page, each depicting both actors engaged in a simple activity. The stimulus sentences were simple SOV declarative sentences with one or two object arguments. Within pages, the pictures were intended to depict the actor carrying out the same action on the self, on the other person, on an inanimate object, or toward an inanimate location.

For each page, the interviewer uttered a stimulus sentence and the child pointed at the corresponding picture. The interviewer then pointed at the highest picture that the child had not pointed at and asked, "And what is Ana doing here?" Once the child responded, the interviewer did the same for the remaining unselected picture on the page. Thus, each of the 14 pages yielded an indicator of the child's comprehension of the stimulus sentence, plus two descriptive sentences corresponding to the remaining pictures.

The results of the comprehension task reported in Kalt (2009a, 2012a) confirmed that in both regions the null third-person object pronominal suffix could be interpreted ±reflexive with ±definite, ±animate reference, whereas the reflexive suffix has only +reflexive interpretation.

Of interest to this study is the fact that simple declarative sentences of the form SOV were the only stimuli uttered by the interviewer, and there were no fully overt possessive phrases among the stimulus sentences: Possessed elements were only marked as such by the third-person possessive suffix. It is possible that the use of SOV sentences in the comprehension task induced a syntactic priming effect among participants (Bock 1986; Loebell and Bock 2003), leading to an overall greater use of OV order during the production task. However, we have no reason to expect syntactic priming effects to differ among participant groups (e.g., Chuquisaqueños vs. Cuzqueños): Differences in the use of OV order between groups must instead reflect underlying between-group differences.

6.1. Population and Participant Selection

One hundred and four children and adolescents from four Quechua-dominant rural agro-pastoralist communities in Chuquisaca, Bolivia, and Cuzco, Peru, participated in the study. Communities consisted of less than 120 households and were over six miles from the nearest town or city. See Table 3 for participants' demographic characteristics. As stated

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4 Sánchez lists *-ta* as a potential marker of definiteness, but we note that the noun marked with *-ta* in example 14 receives generic interpretation.

in Section 2.1, 73.5% of participants in Chuquisaca and 55.6% in Cuzco indicated that no one spoke Spanish to them at home.

Table 3. Demographic characteristics of participants.

	Sex			**Region**	
	Female		**Male**	**Chuquisaca**	**Cuzco**
N children	52		52	50	54

	Age (years)										
	5	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
N children	7	9	8	13	22	14	9	13	7	1	1

6.2. An Initial Distinction between the Two Varieties in the Corpus

Before embarking on our study, we note that at least in the Cochabamba Bolivian variety, *-ta* as a marker of direct objects is known to be in free variation with a zero morpheme that leaves stress on the word-final syllable, whereas stress is normally on the penultimate syllable in Quechua (Herrero and Sánchez de Lozada 1978, pp. 10, 15). This prosodic marking of missing case is not attested in the literature on the Cuzco variety. Interviews in the 2009 corpus are already coded for missing case: Native-speaker transcribers were asked to tag utterances whenever they believed a case marker to have been omitted. Transcribers also placed an accent whenever stress was clearly word-final in the context of missing case. Prosodic marking of missing case is illustrated in examples 20–21 below.

Example 20 has an accent mark written on the penultimate syllable of the first word, where it would be pronounced but not normally written in Quechua (since this is the default stress). In 21, the same accent is written to show that stress is now word-final.

20. Cuader**nó-ta** hap'i-chka-n
    notebook-**ACC** grab-PROG-3
    "He is grabbing the notebook."
    (Chuquisaca, female, age 8)
21. Cuader**nó-Ø** hap'i-chka-n
    notebook-**ACC** grab-PROG-3
    "He is grabbing the notebook."
    (Chuquisaca, female, ages 9 and 12)

7. Analysis and Findings
7.1. Procedures

We tagged approximately 2800 sentences for word order using a Python script that identified the grammatical role of each word according to its constituent affixes. For instance, a word was tagged "Verb" (V) if it contained the progressive suffix *-chka*, past tense suffix *-sqa*, and/or any subject-inflection suffix, whereas a word was tagged "Direct Object" (O) if it contained the accusative suffix *-ta*. We then checked each utterance manually and retagged any words that had been mis-tagged (e.g., "Adverbs" that had been tagged "O" because of *-ta*) and hand-tagged any words that lacked identifying morphology using our knowledge of the discourse and picture task as well as the fact that "Subjects" (S) are unmarked morphologically.

7.2. Analysis of VO vs. OV Word Order

We assessed whether schoolchildren from Chuquisaca versus those from Cuzco differ in the rate of VO vs. OV sentences they produce by analyzing the proportion of such word orders used in 1760 declarative sentences that included at least a verb and a direct object. Sixteen percent of such sentences exhibited "VO" order: This included simple VO sentences that have null subjects (example 22) as well as sentences with SVO (23), VSO (24), and VOS word order (25) (see Table 4 for the frequency of different sentence types).

Table 4. Frequency of VO- and OV-type sentences.

VO-Type Sentences					OV-Type Sentences				
VO	**SVO**	**VSO**	**VOS**	**Total**	**OV**	**SOV**	**OSV**	**OVS**	**Total**
259	19	3	3	284	1402	55	9	10	1476

22. Chura-chka-Ø-n uhut'a-ta
    put-PROG-3OBJ-3 sandal-ACC
    "She's putting the sandal on him."
    (VO; Chuquisaca, female, age 9)

23. Ana hap'i-chka-Ø-n José-ta
    Ana grab-PROG-3OBJ-3 José-ACC
    "Ana is grabbing José."
    (SVO; Cuzco, male, age 10)

24. Maqchi-ku-chka-Ø-n chika-cha maki-n-ta
    wash-REFL-PROG-3OBJ-3 girl-DIM mano-3POS-ACC
    "The little girl is washing her hands."
    (VSO; Cuzco, male, age 6)

25. Hach'i-chka-Ø-n mistura-ta José
    winnow-PROG-3OBJ-3 confetti-ACC José
    "José is winnowing the confetti."
    (VOS; Cuzco, male, age 10)

"OV" sentences ($N = 1,476$) exhibited simple OV (26), SOV (27), OSV (28), or OVS (29) order.

26. Uhut'a-ta chura-chka-Ø-n
    sandal-ACC put-PROG-3OBJ-3
    "She's putting the sandal on him."
    (OV; Chuquisaca, female, age 9)

27. José mistura-ta hach'i-chka-Ø-n
    José confetti-ACC winnow-PROG-3OBJ-3
    "José is winnowing the confetti."
    (SOV; Cuzco, male, age 6)

28. Uma-n-ta José hap'i-ku-Ø-n
    head-3POS-ACC José agarrar-REFL-3OBJ-3
    "José is grabbing his head."
    (OSV; Cuzco, male, age 12)

29. Bisturas-ta hach'i-chka-Ø-n anchay
    confetti-ACC winnow-PROG-3OBJ-3 that.one
    "That one is winnowing the confetti."
    (OVS; Cuzco, female, age 11)

In a small number of cases ($N = 18$), a -*ta*-marked object both preceded and followed the verb in the same utterance. In each such utterance, one of the two objects represented the possessor of the other nominal, and we labeled the utterance as "VO" or "OV" based on the location of the possessed nominal relative to the verb. For instance, we coded example 30 "VO" because the possessed nominal *uyanta*, "his face," follows the verb, whereas we coded example 31 "OV" because the possessed nominal *makinta*, "his hand," precedes the verb:[5]

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[5] Various analyses of these double -*ta* sentences are possible; see for example Lefebvre and Muysken (1988, pp. 148–49) and Masullo (1992). We repeated the analysis reported below with the 18 double-*ta* datapoints omitted and obtained the same significant effects, patterning in the same directions—that is, significant effects of Region ($z = -1.97$, $p < 0.05$), Accusative-Inclusion ($z = 5.94$, $p < 0.001$), and Sex ($z = 2.11$, $p < 0.05$), but not Age ($z = -0.88$, *n.s.*).

30.   José-ta   maqchi-chka-Ø-n   uya-n-ta
       José-ACC   wash-PROG-3OBJ-3   face-3POS-ACC
       "She is washing José's face."

                                          (VO; Cuzco, male, age 5)

31.   Maki-n-ta   hap'i-chka-Ø-n   José-q-ta
       hand-3POS-ACC   grab-PROG-3OBJ-3   José-GEN-ACC
       "She is grabbing José's hand."

                                    (OV; Chuquisaca, female, age 13)

We analyzed the proportion of VO versus OV word order produced in the picture description task using a generalized linear mixed-effects regression (GLMER) analysis fitted using the binomial logit link function and the bobyqa optimizer. In this and following analyses, we fitted the GLMER model in R (R Core Team 2019) using the lme4 package (Bates et al. 2015). The model included Word Order (VO = 0, OV = 1) as the dependent variable. As fixed effects, the model included Region (levels: Chuquisaca (N = 920), Cuzco (N = 840); reference level: Chuquisaca), the inclusion of the accusative marker *-ta* on the direct object ("Accusative-Inclusion"; levels: Yes (N = 1419), No (N = 341); reference: Yes),[6] Sex (levels: Female (N = 906); Male (N = 854); reference: Female), and Age (range: 5–15 years). Finally, the model included Child (N = 101) and Picture (N = 40) as random effects, and random slopes for Region by-Picture: The results of a likelihood ratio test comparing this model to the random intercepts model were significant ($\chi^2(2)$ = 11.87, $p < 0.005$), indicating that random slopes for Region by-Picture are justified for this dataset.[7]

We obtained a significant effect of Region (z = −1.97, $p < 0.05$): Chuquisaqueños produced a greater proportion of OV sentences (89.2% utterances exhibited OV order) than did Cuzqueños (78.0% utterances). Thus, although all schoolchildren produced more OV order than VO, Cuzqueño children deviated more from the canonical order than did children from Chuquisaca (Figure 2A).

We also obtained a significant effect of Accusative-Inclusion (z = 5.91, $p < 0.001$): Sentences in which the accusative marker had been omitted exhibited a greater proportion of the use of OV word order (98.2% utterances exhibited OV order) than did sentences in which *-ta* had been included (80.4% utterances). Conversely, sentences in which the accusative marker had been included exhibited greater variation in the use of VO vs. OV word order than those in which the accusative marker had been omitted, which were largely restricted to co-occurring with OV word order (Figure 2B). We also obtained a significant effect of Sex (z = 2.06, $p < 0.05$): Male children used a greater proportion of OV sentences (86.4% utterances) than did female children (81.5% utterances) (Figure 2C). The effect of Age failed to reach significance (z = −0.88, *n.s.*).

In their rigid use of OV word order in main clauses, Chuquisaqueño schoolchildren differ from the hypothesized norm more than do Cuzqueños, who preserve free word order in main clauses and presumably maintain evidential marking combined with fronting to express focus.

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6   Recall that omission of the accusative marker is a feature of the Bolivian variety alone in this corpus (*N*-Chuquisaca = 338 vs. *N*-Cuzco = 3 utterances). As such, we do not include the interaction of Region by Accusative-Inclusion.

7   Including random slopes for Accusative-Inclusion by-Child ($\chi^2(2)$ = 1.18, *n.s.*; cf. Region, Sex, and Age are all between-Child variables), Sex by-Picture ($\chi^2(2)$ = 3.01, *n.s.*), or Age by-Picture ($\chi^2(2)$ = 3.96, *n.s.*) instead of random slopes for Region by-Picture failed to improve model fit relative to the random intercepts model. Including random slopes for Accusative-Inclusion by-Picture instead of random slopes for Region by-Picture did improve model fit relative to the random intercepts model ($\chi^2(2)$ = 12.10, $p < 0.005$), but not relative to the model that included random slopes for Region by-Picture (AIC-Region by-Picture model = 1386.5, AIC-Accusative-Inclusion by-Picture model = 1386.2; Δ = 0.3, *n.s.*): Since we are ultimately interested in the effects of Region, we included random slopes for Region by-Picture in order to control for within-Picture variation in the effects of Region before adding random slopes for other dependent variables. However, the same effects as in the analysis reported below remained significant and patterned in the same direction in the model that included random slopes for Accusative-Inclusion by-Picture instead (i.e., the effects of Region (z = −2.67, $p < 0.01$), Accusative-Inclusion (z = 3.18, $p < 0.005$), and Sex (z = 2.03, $p < 0.05$) were significant, but the effect of Age was not (z = −1.03, n.s.)).

     Including random slopes for Accusative-Inclusion by-Child ($\chi^2(2)$ = 1.07, *n.s.*) or Age by-Picture ($\chi^2(3)$ = 6.44, *n.s.*) in addition to random slopes for Region by-Picture failed to improve model fit relative to the model that included only random slopes for Region by-Picture. Models that included random slopes for Accusative-Inclusion or Sex by-Picture in addition to random slopes for Region by-Picture failed to converge. Hence, we do not consider models with more complex random effects structures.

     R code: glmer (WordOrder ~ Region + Accusative-Inclusion + Sex + Age + (1|Child) + (1 + Region|Picture), family = binomial, control = glmer Control (optimizer = "bobyqa"), …).
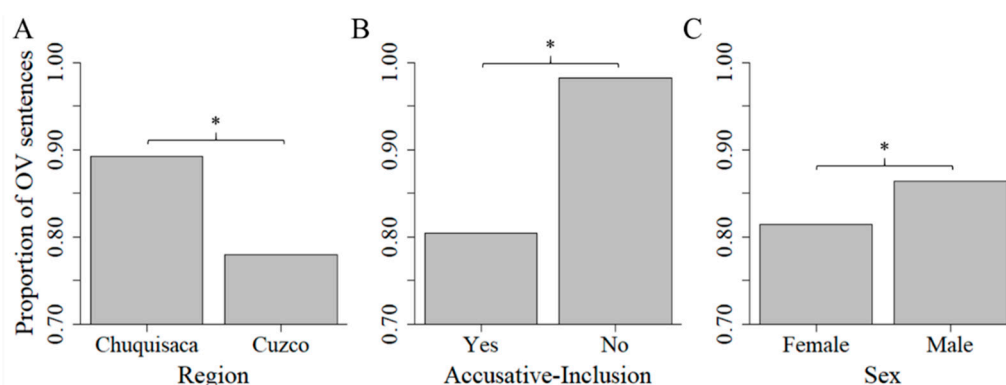
Figure 2. Proportion of OV sentences by (**A**) Region, (**B**) Accusative-Inclusion, and (**C**) Sex. Asterisks indicate that the difference between levels is significant ($p < 0.05$).

The significant difference between male and female schoolchildren in both countries, with males displaying a greater tendency toward OV word order, is somewhat surprising since OV is often correlated with lesser influence from Spanish and boys tend to be exposed to Spanish earlier and more often than girls, according to anecdotal and some statistical evidence in both countries. For example, in Bolivia, Sichra (2009, p. 566) finds that among migrants from Chuquisaca to Santa Cruz, women tended to be monolingual whereas men tended to be sequential bilinguals. One possibility is that male children are also omitting the accusative suffix more than are female children, perhaps its own effect of greater Spanish exposure among boys than girls, which in turn leads to greater OV word order among boys than girls. To assess this, we conducted a binomial GLMER analysis using the bobyqa optimizer, with Accusative-Inclusion (Yes = 0, No = 1) as the dependent variable; Region (levels: Chuquisaca ($N = 920$), Cuzco ($N = 840$); reference: Chuquisaca), Sex (levels: Female ($N = 906$), Male ($N = 854$); reference: Female), and Age (range: 5–15 years) as fixed effects; and random effects for Child ($N = 101$) and Picture ($N = 40$).[8] The effects of Country ($z = -8.51$, $p < 0.001$) and Age were significant ($z = 2.46$, $p < 0.05$): Chuquisaqueños omitted the accusative suffix more often than did Cuzqueños, whereas omission of the accusative suffix decreased with age, perhaps reflecting general changes to children's morphological systems across development. In contrast, the effect of Sex was not significant ($z = 0.41$, *n.s.*): We thus have insufficient evidence to support that male children omit the accusative suffix more than do female children (across countries, 19.7% of utterances produced by males featured an omitted accusative suffix vs. 19.1% of utterances produced by females).

7.3. Analysis of Possessor-Possessed vs. Possessed-Possessor Word Order

We assessed whether Chuquisaqueño and Cuzqueño schoolchildren differ in the rate at which they produce two possible word orders in possessive phrases—the canonical possessor-possessed order and the innovative possessed-possessor order—by analyzing the proportion of the two orders produced in 79 sentences that contained a possessive phrase. In both possessor-possessed ($N = 53$) and possessed-possessor ($N = 26$) orders, the genitive noun was marked with *-q*, *-pa*, or *-p* "GEN" and the possessed noun with a possessive marker (in all sentences analyzed here, this was *-n* "3POS"). Examples 32–33 demonstrate possessive phrases that exhibit possessor-possessed order, whereas examples 34–35 demonstrate possessive phrases that exhibit possessed-possessor order.

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[8]   Including random slopes for Region by-Picture failed to improve model fit relative to the random intercepts model ($\chi^2(2) = 4.67$, *n.s.*), whereas models that included random slopes for Sex by-Picture or for Age by-Picture failed to converge. Hence, we report the results of the random intercepts model.

R code: glmer (Accusative-Inclusion ~ Region + Sex + Age + (1|Child) + (1|Picture), family = binomial, control = glmerControl (optimizer = "bobyqa"), . . .).

32. Ana-q   chaki-n-ta   maylla-chka-Ø-n
     Ana-GEN   foot-3POS-ACC   wash-PROG-3OBJ-3
     "He's washing Ana's foot."
                             (possessor-possessed; Chuquisaca, female, age 11)

33. José-pa   maki-n-ta   hap'i-chka-Ø-n
     José-GEN   hand-3POS-ACC   grab-PROG-3OBJ-3
     "She's grabbing José's hand."
                             (possessor-possessed; Cuzco, female, age 9)

34. Maki-n-ta   huk-pa-ta   maylla-chka-Ø-n
     hand-3POS-ACC   other-GEN-ACC   wash-PROG-3OBJ-3
     "She's washing someone else's hand."
                             (possessed-possessor; Chuquisaca, female, age 10)

35. Chaki-n-ta   Ana-q-ta   maqchi-chka-Ø-n
     foot-3POS-ACC   Ana-GEN-ACC   wash-PROG-3OBJ-3
     "He's washing Ana's foot."
                             (possessed-possessor; Cuzco, male, age 12)

We analyzed the proportion of possessor-possessed vs. possessed-possessor word order produced in the picture description task by conducting a GLMER analysis using the binomial logit link function and the bobyqa optimizer. The model included Word Order (Possessed-Possessor = 0, Possessor-Possessed = 1) as the dependent variable; Region (levels: Chuquisaca (N = 36), Cuzco (N = 43); reference: Chuquisaca), Sex (levels: Female (N = 40), Male (N = 39); reference: Female), and Age (range: 5–15 years) as fixed effects; and Child (N = 39) and Picture (N = 13) as random effects.[9]

As in the previous analysis, we obtained a significant effect of Region ($z = -2.75$, $p < 0.01$): Children from Chuquisaca produced a greater proportion of possessive phrases exhibiting possessor-possessed order (83.3% of phrases exhibited possessor-possessed order) than did those from Cuzco (53.5% of phrases) (Figure 3). Once again, children from Cuzco deviated more from the canonical order (possessor-possessed) than did Chuquisaqueño children. In contrast, the effects of both Sex ($z = -0.60$, *n.s.*) and Age ($z = 0.24$, *n.s.*) failed to reach significance.
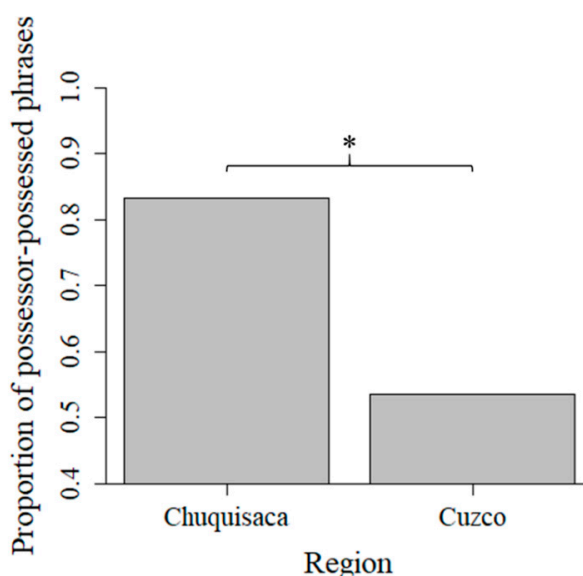
Figure 3. Proportion of possessor-possessed phrases by region. Asterisks indicate that the difference between levels is significant ($p < 0.05$).

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9   Models that included random slopes for Region, Sex, or Age by-Picture failed to converge, likely reflecting that we overfitted the model by adding random slopes (recall that we are analyzing 79 total datapoints here).
R code: glmer (WordOrder ~ Region + Sex + Age + (1 | Child) + (1 | Picture), family = binomial, control = glmer Control (optimizer = "bobyqa"), ...).

In their relative ordering of possessor and possessed nouns, we found that children from Cuzco differ more from the hypothesized adult norm than children from Chuquisaca: Cuzqueños use a greater proportion of possessed-possessor word order, whereas Chuquisaqueños maintain the canonical possessor-possessed order.

7.4. The Emergence of Determiners

Although traditional Quechua grammars lack determiners, Sánchez (2003, pp. 99–101) reports the emergence of both definite and indefinite determiners in Lamas Quechua: In Lamas, schoolchildren use demonstrative adjectives such as *kay*, "this," and *chay*, "that," to specify a definite referent, as well as the numeral *suk*, "one" (cf. *huk* in other varieties, including those studied here), to specify indefiniteness. Adapted from Sánchez (2003, pp. 99–100), example 36 shows the use of *chay* to specify a definite referent, whereas example 37 shows the use of *suk* to specify an indefinite referent in Lamas Quechua:

36. Chaymanta chay wambriyo mira-rka-n chay sapu-ta
    then that boy look-PST-3 that toad-ACC
    "Then, that boy looked at that toad."

37. Suk motelo mira-yka-n suk sapitu-ta
    a turtle look-DUR-3 a toad-ACC
    "A turtle is looking at a toad."

Interestingly, Sánchez (2003, p. 101) finds that in Lamas the use of *suk* as an indefinite determiner is strongly correlated with the omission of accusative *-ta* from objects, leading her to suggest that definite and indefinite determiners are emerging in Lamas to replace certain determiner-like functions ascribed to *-ta* and that are being lost with the accusative marker's omission.

We explored the development of indefinite determiners in Chuquisaca and Cuzco Quechua by analyzing the 38 uses of *huk*, "one/other," that occur in the corpus. Only six instances of *huk* were ascribed to Cuzqueños, and none of them used *huk* to specify an indefinite referent. Rather, in five of the Cuzqueño uses, *huk* co-occurs with *ladu*, "side," to mean "other" in the phrase *huk ladu* "(the) other side, somewhere else," as demonstrated in example 38. In the remaining use, shown in 39, *huk* heads the noun phrase *hukninta*, "one of them."

38. Kay-pi huk ladu-ta hach'i-yu-chka-Ø-n
    here-LOC other side-ACC toss-INT-PROG-3OBJ-3
    "Here, he is tossing it somewhere else."
    (Cuzco, male, age 6)

39. Pay huk-ni-n-ta hap'i-chka-Ø-n
    3 one-EUF-3POS-ACC grab-PROG-3OBJ-3
    "She is grabbing one of them."
    (Cuzco, male, age 13)

Although a few similar uses occur in the speech of Chuquisaqueño children, many more reflect a use of *huk* as an indefinite determiner: In Chuquisaca, we see that *huk* modifies nominals that exhibit a range of grammatical roles, including subjects, as in example 40; direct objects, as in 41 with *-ta* present; and in 42, with *-ta* omitted; and indirect objects, as in 43:

40. Huk qhari warmi-ta hap'i-chka-Ø-n
    a man woman-ACC grab-PROG-3OBJ-3
    "A man is grabbing the woman."
    (Chuquisaca, female, age 10)

41. Huk qhari-ta tupa-chka-Ø-n
    a man-ACC touch-PROG-3OBJ-3
    "She is touching a man."
    (Chuquisaca, male, age 8; female, age 10)

42.　　Huk　　　　　　warmi　　　　　　　hap'i-chka-Ø-n
　　　a　　　　　　　woman　　　　　　　grab-PROG-3OBJ-3
　　　"He is grabbing a woman."
　　　　　　　　　(Chuquisaca, male, age 11)

43.　　Huk　　　　　　warmi-man　　　　　punchu-chi-chka-Ø-n
　　　a　　　　　　　woman-DAT　　　　　poncho-CAUS-PROG-3OBJ-3
　　　"He is putting the poncho on a woman."
　　　　　　　　　(Chuquisaca, female, age 10)

Unlike Cuzco but like Lamas, Chuquisaca Quechua appears to be on the path to developing full-fledged indefinite determiners from *huk*, "one." Like Sánchez (2003), we observe that a variety that is losing accusative-marking is developing indefinite determiners. However, unlike Sánchez, we do not find a correlation within sentences between the omission of the accusative marker and the use of indefinite *huk*. Rather, when *huk* specifies a direct (or indirect) object as indefinite in Chuquisaca, it more often co-occurs with overt case marking than without: *-ta* marks the direct object in 14 out of the 15 sentences in which *huk* specifies indefiniteness of a direct object in this corpus.

8. Discussion of Results

The fact that rigid use of OV word order in Bolivia correlates with a significantly higher rate of dropped accusative markers can be explained by their shared function as markers of grammatical roles. We suggest that the loss of case marking in Chuquisaca places a greater burden on word order to indicate grammatical roles, resulting in a more consistent use of the canonical OV word order. This tradeoff between case marking and rigidity of word order parallels changes attested cross-linguistically. For instance, Old English employed rich case marking and relatively free word order, and as case marking was lost word order became a more rigid cue to grammatical relations, as seen today in Modern English (Marchand 1951; Tily 2010). Our results are also consistent with experimental work using the artificial language-learning paradigm to explore language change in second language acquisition: When learning a language with optional case marking, adults employ more case marking in their own productions when the input language has a flexible word order (i.e., word order is a less reliable cue to grammatical roles) than when word order is fixed, suggesting a tradeoff between word order and case marking that drives changes in both areas of grammar (Fedzechkina et al. 2016).

The finding that accusative case marking is dropped more frequently in Chuquisaca than in Cuzco could perhaps be explained by the regional tendency to retain penultimate stress on the final syllable after dropping *-ta,* rather than shift stress to the new penultimate syllable, as foreshadowed in Section 6.2. It may be that this prosodic marking made objective case-omission more frequent in Bolivia, but ultimately proved unreliable to fully distinguish subjects from objects, requiring the use of a more rigid word order to specify grammatical relations.[10]

As for differences between our findings and Hintz's, we should note that the loss of the accusative marker places a greater semantic load on nominals to spell out definiteness or specificity even in the absence of word order changes. Since Quechua verbs do not normally occur to the left of nouns but adjectives do, there is no structural reason why the convergent position occupied by the Quechua adjective and the Spanish determiner should not take on this innovative feature specification that is more like Spanish. In fact, the determiner position in Spanish has adjectival qualities since it agrees in number and gender with the noun.

9. Conclusions and Next Steps

Recall that Hintz looked at the suppression of verbal suffixes and the emergence of new verbal auxiliaries as an indicator of typological shift in the Quechua language

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[10]　An anonymous reviewer suggests that greater Aymara influence in the South, even centuries ago, could also contribute to more frequent dropping of accusative *-ta* since Aymara marks the accusative by suppressing the final vowel of the marked N(P) (i.e., via subtractive morphology).

family. Hintz called this increase in auxiliary verbs "periphrasis," and we suggest here that something akin to periphrasis can also occur in noun phrases if a language that relies on a combination of case markers and evidential markers to express definiteness begins to rely instead on a category of newly created function words such as determiners to express it.

We have shown that suppression of morphological marking of objects within clauses and the emergence of an indefinite determiner coincides with more canonical word order in the Chuquisaca variety of Southern Quechua as compared to its close relative in Cuzco. This finding contrasts with the evolutionary trend reported by Hintz and with the trends reported by Sánchez for QI and IIB languages. In Hintz's (2009, 2016) studies, suppression of morphological marking leads to an increase in periphrasis, and word order shift is both a cause and effect of this cycle. In Sánchez's (2003) study, the suppression of accusative marking and emergence of indefinite determiners co-occurs with a higher rate of SVO word order. Overall, however, our findings conform to Hintz's observation of typological shift from polysynthetic to more isolating constructions in the Quechua family and Sánchez's observation of functional convergence in the creation of new functional categories.

An area for future exploration stems from the fact that, in the varieties studied most closely by Hintz and Sánchez, the suffixes marking evidentiality may also contribute to the interpretation of definiteness. Morphological marking of evidentiality is disappearing in some Bolivian varieties (Muntendam 2015). The loss of evidential markers could potentially have exacerbated a void in expression of definiteness perceived by speakers who have dropped accusative markers.

The current study was limited to sentences generated by children and adolescents within a single experimental task type: picture selection and description. A next step would be to analyze the structure of sentences in more complex conversations and narratives produced in Cuzco and Chuquisaca, which are also archived at AILLA (Kalt 2009b, 2016) but are not yet tagged for word order. Such narratives in Cuzco elicited more complex morphology (Kalt 2015), and it would be interesting to see whether the same correlations of word order, morphological marking, and freestanding determiners hold across task types. We hope that this paper has shown that further analysis of comparable adult corpora would continue to yield worthwhile results.

We have shown that contact-induced change is not monolithic nor entirely determined by factors previously discussed in the literature. Two genetically related languages have begun to diverge in their structure, despite the fact that their speakers are all sequential bilinguals and speak a non-elite variety of Quechua that is in contact with roughly the same variety of Andean Spanish and other indigenous languages. The internally and externally motivated mechanisms of change proposed by Hintz (suppression of suffixation leads to acceleration of periphrasis) and Sánchez (frequent activation of diverse functional feature specification in the bilingual mind allows typologically distinct grammars to converge) were extremely useful in conducting this study, even though the language varieties we worked with show emerging speech patterns that differ from the ones documented by Hintz and Sánchez. Small changes to a language's grammar may evolve into larger structural changes over time: Typological shift in morphology and word order is indeed a complex interwoven phenomenon.

Appendix A

Below are sample stimulus sentences and one of the picture sets used to elicit data in the corpus we analyzed (Kalt 2009b).

SOV sentence with ditransitive verb and multiple interpretations of pronominal object:

44. Ana ujut'a-ta chura-Ø-n
    Ana sandal-ACC put-**3OBJ**-3
    "Ana puts the sandal **on him**."
    "Ana puts the sandal **on herself**."
    "Ana puts the sandal **there**."
    "Ana puts the sandal **somewhere**."

SOV sentence with ditransitive verb and reflexive reading:

45. José sumbuku-ta chura-**ku**-Ø-n
    José hat-ACC put-**REFL**-3OBJ-3
    "José puts the hat on himself."

SOOV sentence with ditransitive verb:

46. José chumpa-ta puñuna-pata-man chura-Ø-n
    José sweater-ACC bed-top-DAT put-3OBJ-3
    "José puts the sweater on the bed."

SOV sentence with transitive verb and alienable object:

47. Ana awana-ta hap'i-Ø-n
    Ana loom-ACC grab-3OBJ-3
    "Ana grabs the loom."

SOV sentence with transitive verb and inalienable possessed object:

48. José uma-n-ta hap'i-Ø-n
    José head-3POS-ACC grab-3OBJ-3
    "José grabs her head."
    "José grabs someone's head."

SOV sentence with transitive verb and reflexive inalienable possessed object:

49. José kukuchu-n-ta hap'i-ku-Ø-n
    José elbow-3POS-ACC grab-REFL-3OBJ-3
    "José grabs his elbow."

Stimulus sentence: Ana ujut'ata churan.

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