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Learning the meaning of verbs: insights from Quechua

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Learning the meaning of verbs: insights from Quechua

INTRODUCTION

Learning the argument structure of verbs is a drawn-out process for children, and, by many accounts, children undertake the task of acquiring this aspect of meaning one verb at a time. Researchers have proposed a number of constraints that facilitate the verb learning process, some posited as innate. For example, many claim that children's hypotheses are constrained by prelinguistic cognitive endowments, e.g., the ability to distinguish arguments and predicates, a set of thematic cores (lexical semantic templates), and syntax-semantics linking rules (Pinker, 1989). Even prelinguistic infants are sensitive to the features of events, such as the identity and number of relevant participants (Gordon, 2003). In this regard, Gordon remarks that 'the human conceptual system constructs event representations that possess argument-like structures independent of overt linguistic input' (2003: 1). Noting that children are sensitive to the conceptual-semantic prominence of sentence subjects, Fisher & Song (2006) propose a further cognitive endowment: protoagent and protopatient categories. There is also evidence that children seek one-to-one correspondences as they map form to meaning: they are reluctant to accept synonymous forms. This constraint, either innate or acquired, is embodied in Pinker's (1984) Unique Entry Principle, Clark's (1987) Principle of Contrast, and Markman's (1992) Mutual Exclusivity Assumption. Naigles & Lehrer (2002: 547) explain that the Principle of Uniqueness 'operates by disallowing more than one lexical entry from filling a semantic niche.' For example, Brooks & Zizak (2002) have shown that the repeated occurrence in the input of an unaccusative verb such as *disappear* in a periphrastic causative construction (*make the money disappear*) serves to pre-empt children's incorrectly using the verb as a transitive-causative (**disappear the money*).

All these constraints are based largely on observations of children acquiring English. The challenge to universality is whether or not they operate in other languages, particularly those that are typologically very different from English. A case in point is Landau & Gleitman's (1985) proposal that children acquire aspects of verb meaning through syntactic bootstrapping, whereby the meaning children assign to a verb is constrained by cues in the verb's syntactic environment. This works well for a child acquiring English because an English verb root can stand alone as an independent morpheme, together with its arguments, which are explicit and lined up in a rigid order. How well would it work for Quechua-speaking children? Quechua speakers often omit arguments, and a great deal of information is encoded in suffixes that are added to verb roots, as illustrated in (1). Additionally, verb roots never occur in isolation as free morphemes[1].

(1)	Asi-chi-wa-nku.	Ankay-man chura-ra-n.
	laugh-CAUS-3PL	this-DAT put-PAST-3
	'They make me laugh.'	'He/she put it here.'

In Quechua sentences with explicit arguments, word order is very flexible so that word order is not a cue to the identity of external and internal arguments.

During the protracted process of acquiring verb meaning, children produce errors, incorrectly assigning a particular argument structure to verbs that do not allow it. For example, English-speaking children may use causative-transitive verbs, such as *kill,* intransitively (e.g., *Mary killed*, meaning 'Mary died'), or they may use unaccusative-intransitive verbs, such as *die,* transitively (e.g., *Mary died the fly*, meaning 'Mary killed the fly'). In fact, children produce the second type of overgeneralization far more frequently than the first. If this asymmetry is observed in other languages, we must consider the source of this bias, as well as factors that eventually help children recover from error.

The present study sheds light on these issues by providing insights from Quechua, a language typologically very different from English. First, experimental evidence is provided which corroborates previous findings that Quechua-speaking children produce the same asymmetrical error pattern as English-speaking children in their production of change-of-state verbs. Thereafter, an account of this bias is offered. The paper concludes with a discussion of learnability issues in Quechua verb-learning and recovery from error, with particular attention to some of the constraints that have been proposed for children acquiring English as their first language. Before considering the Quechua data, we turn to a discussion of relevant previous findings.

PREVIOUS FINDINGS

Identifying subjects and objects: Semantic-conceptual criteria

Children make use of semantic-conceptual information to identify the subject and the direct object in an event. Gropen, Pinker, Hollander & Goldberg (1994) argue that children are attentive to the entity in a main event that is affected, or caused to change, noting that in predicates such as *pour the water* and *fill the glass*, the affectedness can be either a change of location or a change of state, respectively. They propose that children 'link the argument that is specified as caused to change in the main event of a verb's semantic representation to the grammatical object' (1994: 289). After teaching 3- to 5-year-olds two novel verbs, one specifying a manner of motion (zig-zagging) and the other, an endstate (sagging), these researchers elicited sentences from children containing the novel verbs. The children's sentences showed recognition of the affected entity and appropriate linking of the entity to the direct object. The authors note, however, that there is an asymmetry in children's errors when they produce sentences with real verbs: they are more likely to produce sentences with **fill the water*

predicates than with **pour the glass* predicates. Apparently, it is more difficult for children to acquire meanings related to changes of state than those related to changes of location.

Fisher & Song (2006) provide experimental evidence that children are sensitive to the semantic prominence of subjects. They argue that semantically prominent arguments are those entities that are animate, agentive, first-and second-person, and situationally 'given' (discourse-old). In one experiment, 3-year-old children were asked questions such as 'Which one is (verb)-ing the other one?' after hearing a sentence with a novel verb and viewing videos of objects in which animacy and mobility were manipulated. For the sentences that were ambiguous, children consistently identified as subjects the participants that were animate or moving. Based on this and other experimental findings, Fisher & Song propose that children are predisposed to mapping the argument which is semantically prominent onto the position that is structurally prominent in a sentence, i.e., the subject. They further suggest that the abstract categories of protoagent and protopatient are part of children's prelinguistic cognitive endowment.

Syntactic Bootstrapping

There is compelling evidence that syntactic bootstrapping helps English-speaking children acquire the argument structure of verbs. Naigles and her colleagues (notably, Naigles, Fowler & Helm, 1992; Naigles, Gleitman & Gleitman, 1993) have demonstrated that two-year-old children adhere to Frame Compliance in their interpretation of verbs; that is, they accept the meaning of a verb corresponding to the syntactic frame in which it is presented, even when the frame is ungrammatical. For example, on hearing the sentence, **The tiger goes the lion*, children initially enact the sentence as if *go* were a transitive verb meaning 'cause to go' because it is presented in a transitive syntactic frame. Bunger & Lidz (2004) have shown that two-year-olds make use of the intransitive and transitive frames in interpreting a novel alternating verb equivalent in meaning to *bounce* (e.g., *Mary bounced the ball; The ball bounced*). According to

Naigles and her colleagues, children eventually move from Frame Compliance (modifying the verb meaning to fit the syntactic frame) to Verb Compliance (modifying the syntax to fit the verb). Nonetheless, Naigles & Lehrer (2002) report an asymmetry in the performance of five-year-old English- and French-speaking children who were asked to enact sentences with verbs presented in ungrammatical syntactic frames: their enactments of intransitive verbs in transitive frames were Frame Compliant, whereas their enactments of transitive verbs in intransitive frames were Verb Compliant.

Asymmetry in overgeneralization

Naigles & Lehrer note that this asymmetry is a consistent finding in studies of the acquisition of argument structure by English-speaking children, one which eludes explanation. Children typically make errors of overgeneralization in verbs, especially those that alternate between intransitive and transitive uses. Among these are verbs that express changes of state, such as English *break*, which may have both intransitive-inchoative and transitive-causative uses:

The cup broke. [intransitive-inchoative]

Peter broke the cup. [causative-transitive]

The overgeneralization errors produced by English-speaking children have been well-documented (notably, Bowerman, 1974; Lord, 1979; Loeb, Pye, Richardson & Redmond, 1998). As shown in the following examples from Loeb, Pye, Richardson & Redmond (1998: 1104), even children as old as six years make overgeneralization errors.

(3;7) The snake cutted in half. [transitive used as inchoative intransitive]

(4;2) Watch me disappear this spaghetti. [inaccusative intransitive as causitive-transitive]

(6;2) You can jump me later dad. [unergative intransitive as causative-transitive]

Researchers report the same asymmetry in the pattern of overgeneralization errors produced by English-speaking children that was observed experimentally by Naigles & Lehrer (2002): even though the errors are bidirectional, children use intransitive verb forms as causative-transitives more frequently than they use transitive verb forms as intransitives.

Overgeneralization errors have been reported in language acquisition studies for several other languages besides English (e.g., Figueira, 1984, for Brazilian Portuguese; Aksu-Koç & Slobin, 1985, for Turkish; Berman, 1986, for Hebrew; Pye, 1993, for K'iche; Allen, 1996, for Inuktitut; Cheung, 1998, for Cantonese; Naigles & Lehrer, 2002, for French). The same asymmetry observed in English-speaking children was reported for children acquiring Brazilian Portuguese, Hebrew, Inuktitut, and French; however, children acquiring K'iche, an ergative language, produced the opposite error pattern. Although reports from other languages strongly suggest that overgeneralization errors are universal and tend to follow an asymmetrical pattern, the proposed constraints on the acquisition of argument structure are largely founded on observations of English-speaking children. As noted by Naigles & Lehrer (2002), language-specific aspects must have a role in children's acquisition of argument structure.

Alternating Change-of-State Verbs

As mentioned previously, alternating change-of-state verbs, such as English *break*, may have both intransitive-inchoative and transitive-causative uses, e.g., *The cup broke* (intransitive-inchoative) and *Peter broke the cup* (causative-transitive). English is unusual in allowing the same verb form in both causative-transitive and inchoative-intransitive uses. In many other languages, the basic verb form is transitive-causative, and the intransitive variant bears an additional inchoative morpheme (e.g., Spanish and French). In others, by contrast, the basic

verb form may be intransitive, and the transitive variant bears an additional morpheme, often a causative marker (e.g., Turkish and Quechua).

In this regard, Haspelmath's (1993) classification of 31 inchoative/causative verb pairs in 21 different languages yielded two interesting findings. First, there was a great deal of typological diversity among the languages represented in the study with regard to the basic, unmarked forms for these verbs. Second, across the languages, verbs expressing events probably instigated by an external entity tended to be basically causative-transitive (e.g., *break, close, open*). In like manner, verbs expressing events likely to occur spontaneously, without the intervention of an external entity, tended to be basically inchoative-intransitive (e.g., *boil, wake up, dry*).

Finally, Haspelmath noted that verbs—change-of-state and others—can be located on a continuum, such as the following, which indicates the 'likelihood of spontaneous occurrence'(adapted from Haspelmath, 1993: 105):

```
    | ------- ----- | ------------ | ------------ ----- |
kill, wash    break, close     boil, melt          ------------------------------
                                                   |                            |
                                          bloom, disappear                laugh, run
```

The verbs at the left end of the continuum express events always interpreted as externally caused (never spontaneous), and those at the right, events that always occur spontaneously. The verbs at the right include unaccusative verbs such as *bloom* and *disappear*, as well as unergative verbs such as *laugh* and *run.* It is the verbs in the middle of the continuum that participate in inchoative/causative alternations. This is because they can be construed as expressing events that are either externally caused or occurring spontaneously. It is these mid-range verbs that participate in the so-called causative alternation in English.

Levin & Rappaport Hovav (1995, 1998) assert that the verbs which participate in the English causative alternation are basically causative-transitive; that is, they are dyadic predicates expressing events construed as externally caused. They present the following lexical semantic representation for the alternating change-of-state verbs (1998: 108):

[x CAUSE [BECOME [y <*STATE*>]]]

On their analysis, the inchoative-intransitive variant of an alternating verb is derived through lexical binding of the CAUSE sub-event, which prevents the projection of [x] to argument structure. Unaccusative verbs such as *disappear*, which describe eventualities that always occur spontaneously, lack the CAUSE sub-event in their lexical semantic representation. In line with Levin & Rappaport Hovav's claim, the basic forms of alternating change-of-state verbs in many of the world's languages describe events that are externally caused (Haspelmath, 1993). However, for some alternating verbs, Levin & Rappaport Hovav acknowledge 'variation both within and across languages with respect to whether verbs describing such events are classified as internally or externally caused' (1998: 99).

Quechua Change-of-State Verbs

Some Quechua change-of-state verb roots are basically transitive, as in English. According to Levin & Rappaport, these are interpreted as expressing events that are externally caused. For example, the verb root, *wisq'a-* 'close', is causative-transitive, and the inchoative intransitive must be formed by affixing the reflexive suffix *-ku-*:

(2) a. Wisq'a-ra-n.
close-PAST-3
'S/he closed it.'

b. Wisq'a-ku-ra-n.
close-REFL-PAST-3

'It closed.'

However, a number—perhaps a majority—of the Quechua change-of-state verbs corresponding to the English alternating verbs are basically intransitive. Following Levin & Rappaport Hovav, these are construed as expressing events that are internally caused—as occurring spontaneously. Thus, an unaccusative verb root such as *t'impu-* 'boil' is inchoative-intransitive, and the causative-transitive variant is formed by affixing the causative suffix *-chi-:*

(3) a. T'impu-chi-ra-n.

boil-CAUS-PAST-3

'S/he boiled it.'

b. T'impu-ra-n.

boil-PAST-3

'It boiled.'

Change-of-State Verbs Derived from Property States

There is a further complication for children learning Quechua change-of-state verbs. Koontz-Garboden (2005) differentiates states which result from prior events, e.g., *breaking*, ('result' states) from those that do not. e.g., *(being) sad* ('property' states). Property states denote properties that are generally described by adjectives, and their lexical semantic representation is simply [x <*STATE*>]. In English, the corresponding result state is often derived by adding the suffix *-en* to the adjectival form, as in *redden, loosen, sadden,* and *brighten*. For other English change-of-state verbs, the property state and the result state may have the same form (e.g., *cool, dry, clear*), as in *The clothes are dry, The clothes dry quickly, The sun and the wind dry the clothes.* Koontz-Garboden asserts that the property state is both conceptually and morphologically basic across languages. Quechua, with its transparent, regular morphology, illustrates this very well. The transformative suffix *-ya-* 'become' is added to adjectival roots to create intransitive result

states; the causative transitive variant is formed by appending causative *-chi-* to this intransitive verb stem. This is shown in (4).

(4) a.	P'acha *qhilli* ka-sha-n.	Pampa *api* ka-sha-n.
	clothes dirty be-PROG-3	floor wet be-PROG-3
	'The clothes are dirty.'	'The floor is wet.'
b.	P'acha *qhilli*-ya-n.	Pampa *api*-ya-n.
	clothes dirty-TRANS-3	floor wet-TRANS-3
	'The clothes get dirty.'	'The floor gets wet.'
c.	P'acha-ta *qhilli*-ya-chi-ra-n.	Pampa-ta *api*-ya-chi-n.
	clothes-ACC dirty-TRANS-CAUS-3	floor-ACC wet-TRANS-CAUS-3
	'S/he dirties the clothes.'	'S/he wets the floor.'

This Quechua morphological process is straightforward, and transformative *-ya-* appears to be fully productive. However, in Quechua, there are near synonyms for some of these verbs, which consist of a nominal root bearing the factitive suffix *-cha-* 'make, make into'. This is possible because there is no clear distinction in Quechua between adjectives and nouns (e.g., Lefebvre & Muysken, 1988). Change-of-state verb stems formed in this way are usually transitive. The factitive morpheme is not productive; that is, Quechua speakers do not freely coin factitive stems by adding the factitive suffix to any noun. Examples of these verb forms are presented in (5).

(5) a. P'acha-ta *qhilli*-cha-n.

clothes-ACC dirt-FACT-3

'S/he dirties the clothes.'

b. Pampa-ta *api*-cha-n.

floor-ACC wet-FACT-3

'S/he wets the floor.'

Faced with the task of producing the Quechua equivalent of *Who dirtied the clothes?* from the prompt, *The clothes are dirty,* a child might know that there is a factitive verb stem corresponding to the property state, producing forms such as those shown in (5). This would be somewhat comparable to an English-speaking child knowing that *clean* can be used to express both the property state and the change of state. Alternatively, if the child does not know a particular factitive stem, s/he might resort to production of a causativized transformative stem as in (4c), making use of a morphological process that is fully productive in Quechua. This is somewhat comparable to the utterance produced by a 3- or 4-year-old English speaking child, provided in Peccei (1999: 101): 'I putted my room clean'.

Previous Findings: Spontaneous Production of Quechua Causatives

In observations of naturalistic speech produced by Quechua-speaking children, Courtney (2002) noted that, by the age of three years, Quechua-speaking children no longer have any difficulty producing appropriate causativized forms of verbs which do not denote changes of state. That is, they successfully produce the transitive and intransitive permutations of unergative verb roots, those expressing events always construed as internally caused, e.g., *puri-/puri-chi-* 'walk' (intransitive/causative-transitive). In fact, by the age of 2;8 to 2;9, Quechua-speaking children produce a number of different causativized verb roots, and, by the age of 3 years, they are using different case-markers on the causee to show direct and indirect causation, as shown in the following examples from Courtney (2002), here renumbered for convenience. The age of each child is shown at the end of the Quechua sentence.

(6) a. Noqa pasa-chi-pusaq wawa-<u>ta</u> pampa-pi. (2;8)

1st-SG pass-CAUS-FUT1 baby-ACC floor-LOC

'I'll make the baby go/pass on the floor.'

b. Chikalla-man puri-chi-sha-n. (2;10)

girl-DAT walk-CAUS-PROG3

'He's having the little girl walk.'

c. Noqa zorro-wan kani-chi-wanchis. (3;2)

1st-SG fox-INSTR bite-CAUS-1PL-OBJ

The case inflection on each causee is underlined, and the different case inflections correspond to different degrees of directness of causation, as follows: Accusative > Dative > Instrumental. By the age of 3 years, Quechua-speaking children even coin unergative verb roots, producing the appropriate causative-transitive variant by affixing Causative *-chi-:*

(7) T'it'i-chi-sa-ni carru-ta. (3;1)

beep-CAUS-PROG-1 car-ACC

'I'm making the car go "beep, beep".'

In like manner, as reported in Courtney (2002), children have no difficulty producing the appropriate intransitive and transitive variants of verb roots that express eventualities invariably interpreted as externally caused (e.g., *paka-/paka-ku-* 'hide' (transitive/intransitive). This includes the manipulation of pairs such as suppletive *sipi-* 'kill' and *wañu-* 'die', illustrated in the following utterances produced by different children and renumbered for convenience (Courtney, 2002: 54-55):

(8) a. Sipi-ru-sun-chu? (2;6)

kill-EXH-1PL-INTERR

'Shall we kill it?'

b. Kuliba-ta ahina wañu-chi-nqa alqo. (2;11)

snake-ACC thus die-CAUS-3FUT dog

'The dog will kill the snake like this.'

It is the alternating change-of-state verbs—those that fall in the middle of Haspelmath's continuum—which are difficult for Quechua-speaking children. If children produced bidirectional overgeneralizations, there would be evidence of four types of errors, as follows:

(9) a.	Manka-ta p'aki-chi-n.	intended:	Manka-ta p'aki-n.
	pot-ACC break-CAUS-3		pot-ACC break-3
	'S/he makes someone break the pot.'		'S/he breaks the pot.'
b.	Manka p'aki-n.	intended:	Manka p'aki-ku-n.
	pot-NOM break-3		pot-NOM break-REFL-3
	'The pot breaks something.'		'The pot breaks.'
(10) a.	* Unu-ta t'impu--n.	intended:	Unu-ta t'impu-chi-n.
	water-ACC boil-3		water-ACC boil-CAUS-3
	???		'S/he boils (the) water.'
b.	*Unu t'impu-ku-n.	intended:	Unu t'impu-n.
	water-NOM boil-REFL-3		water-NOM boil-3
	???		'The water boils.'

The verb root meaning 'break', *p'aki-*, is basically causative-transitive, and the inchoative-intransitive is correctly formed by affixing the reflexive morpheme, *-ku-*. The verb root meaning 'boil', *t'impu-*, is basically unaccusative-intransitive, and the causative-transitive is formed by appending the causative suffix, *-chi-*. The Quechua-speaking children in Courtney's (2002) study produced both of the error types shown in (10); however, they did not produce either of the errors shown in (9). That is, they used unaccusative-intransitive verb roots as causative-transitives, but they did not use the causative-transitive roots as unaccusative-intransitives.

Thus, the overgeneralizations produced spontaneously by the Quechua-speaking children in Courtney's (2002) study displayed the same asymmetry observed in other languages.

In his observation of K'iche-speaking children, Pye (1993) attributed overgeneralization errors to lapses in lexical retrieval, noting that the children's errors were inconsistent. The Quechua-speaking children in Courtney's study also produced the correct forms part of the time; however, adding the reflexive suffix /-ku-/ to inchoative-intransitive verb roots clearly indicates the wrong interpretation and not merely difficulty in lexical access. Nonetheless, the naturalistic data in Courtney's study yielded relatively few tokens of change-of-state verbs, and there is always the problem with this type of data that the communicative context may not conclusively determine whether or not the intended meaning is transitive or intransitive. Consequently, a procedure was designed to elicit child production of the transitive variants of Quechua change-of-state verbs.

FORMAL ELICITATION OF QUECHUA CHANGE-OF-STATE VERBS

Methodology

Participants

In all, 30 children, aged 2;8 to 4;11 (mean age = 48 months), were tested in their home communities, all situated in the province of Paruro in Cusco, Peru. The children live in three different rural communities, which nevertheless share the same variety of Quechua. Additionally, two 12-year-old boys were tested first in order to establish a basis of comparison. Both boys had no difficulty producing all the appropriate elicited verb forms, and they were so captivated by the game format of the test that they immediately volunteered to take on one of the investigator roles in order to keep playing the game. Since the socioeconomic status of all these children is low, even by Peruvian standards, the children lack toys, books, and television, and they are unacquainted with the lifestyle of mainstream Peruvians. The younger children

spend their days with their mothers, generally tending the family livestock out in the fields. The older children attend kindergarten or elementary school, where they typically struggle to learn Spanish. Although the parents of the children may be bilingual in Spanish and Quechua, particularly the fathers, Quechua is spoken at home: it is the children's first language.

Target Forms

The following transitive variants of Quechua change-of-state verbs were elicited in the test, which consisted of ten items. Formation of the transitive variants of the basically intransitive verbs presented on the right requires affixation of the Causative morpheme, -*chi*-.

Basically transitive: (externally caused)			Basically intransitive (internally caused)	
kicha-	open		rikch'a-chi-	wake up
kachari-	untie, loosen		chinka-chi-	make disappear = lose
phuku-	blow (out)		thiqti-chi-	fry
t'ikra-	overturn		qoñi-chi-	warm
api-cha-	wet	OR	api-ya-chi-	wet
qhilli-cha-	dirty	OR	qhilli-ya-chi-	dirty

As shown in the last pair of verb forms in each column and discussed previously, Quechua provides two means of forming the equivalent verbs for *wet* and *dirty*. The factitive suffix –*cha*- is appended to nouns in the derivation of verb stems. These verb stems are usually transitive, and the intransitive variant is formed through the addition of the reflexive suffix -*ku*-. The second option requires affixation of transformative -*ya*- to the root form, resulting in a basically intransitive verb stem. The transitive variant is formed by causativizing the verb stem. Although there are twelve verb forms presented on the list, only ten forms were elicited in the test, including either possibility for the last two verbs, both property states. According to Levin & Rappaport Hovav (1995, 1998), all the verbs except *chinka*- 'disappear' participate in the

causative alternation. They maintain that verbs of (dis-) appearance and existence are always construed as describing events that occur spontaneously, without the intervention of an external entity. However, it is possible that verbs meaning *disappear* once alternated, having lost the external-causation interpretation over time. In this regard, Courtney (2002: 34) states: 'A case in point is the Spanish verb *desaparecer* (disappear), which once alternated' (Moliner, 1992; Peers, Barragán, Vinyals & Mora, 1960). In addition to these semantic and morphological criteria, the test verbs were selected because they are commonly used in everyday life and readily depicted in the game format used for the test.

Test Protocol and Procedures

The test involves two investigators, one of whom manipulates a puppet, Santiago, as well as the props used for displaying the scenes viewed by the participants. This is Investigator B. The second investigator, herein referred to as Investigator A, explains the instructions to the child and carries out all the verbal elicitation portions of the test. Children learn the test procedures during practice trials with verbs other than those selected for the experimental trials.

The format of the test is as follows. Investigator A asks the child to pretend that s/he lives in the house with her and with Santiago, the puppet. Investigator A explains that she and the child are going to the fields and Santiago will remain in charge of the house. The child is told that Santiago sometimes doesn't take very good care of things, so that they can expect to find some changes on their return to the house from the fields (actually, the adjacent room). On their return, Investigator A and the child will take turns asking Santiago who has changed certain things. It must be pointed out that the verb root for result states is given to the child in Investigator A's comment about the scene. In one scene, for example, Investigator A comments, *Wawacha rikch'asqa* 'The baby is awake', using the resultative form of the root *rikch'a-* 'awaken'.

The child's question requires the causativized form of the verb: *Pitaq rikch'a-chi-ran?* 'Who woke him/her up?' (For the property states, the prompt included only an adjective.) In this way, Quechua has the means of providing the lexical root for the child's response without giving away the appropriate transitive verb form. The game consists of five scenes, each eliciting two targeted verb forms. The five scenes are presented to the children in random order. All of the items depicted in each scene are familiar to the children.

One of the five experimental scenes is presented below in the original Quechua and in English translation. The underlined form in the child's response is the elicited verb form.

INVESTIGATOR A, *pointing to different props in the scene*:

Qhawariy, Santiago. Kaypi kashan manka. Manka uhupi calducha kashan.

Look, Santiago. Here's the pot. There's some soup in the pot.

Runtupas kaypi kashan. Alqochaypas kaypi kashan. Velataq k'anchasqa kashan.

And here's an egg. And here's my doggie. The candle is lit.

Santiago, allinta cuidanki!

Santiago, take good care of everything!

On their return from the fields, they see that a number of items in the scene are changed:

INVESTIGATOR A:

Qhawariy! Caldu mikhusqa. Pin calduta mikhuran? Qhawariy, runtu thiqtisqa.

Look! The soup is eaten up. Who ate the soup? Look, the egg is fried.

CHILD: Pitaq <u>thiqtichiran</u>?

Who fried it?

INVESTIGATOR A:

Qhawariy! Alqochayri maypi kashan? Pin suwaran? Qhawariy, vela phukusqa kashan.

Look! *Where's my doggie?* *Who stole it?* *Look, the candle is blown out.*

CHILD: Pitaq phukuran?

Who blew it out?

Results

One child's responses were eliminated from the analysis because he produced only bare roots for every verb, leaving 29 children (14 female and 15 male). Because these 29 children sometimes responded with verbs other than the root/stem provided in the prompt, their responses were coded using six categories, as follows:

Correct verb form	appropriate form of root provided in the prompt
Incorrect verb form	inappropriate form of root provided in the prompt: omission or addition of Causative /-chi-/; omission of /-ya-/ Examples: *thiqti-* for *thiqti-chi-* 'fry'; *t'ikra-chi-* for *t'ikra-* 'overturn'
Good substitution – same transitivity	Substituted root has approximately the same meaning as the root provided in the prompt and the same transitivity status Example: *paska-* 'untie' for *kachari-* 'loosen, untie'
Good substitution – different transitivity	Substituted root has approximately the same meaning as the root provided in the prompt but has a different transitivity status Example: *wañu-chi-* 'extinguish' for '*phuku*' 'blow out'
Inappropriate substitution	Substituted form is different in meaning from given verb Examples: *na-* 'do something' for *t'ikra-* 'overturn'; *mikhu-* 'eat' for *chinka-chi-* 'lose'
No response	Failure to provide any response

In the coding scheme, acceptable substitutions—those with nearly the same meaning as the given verb—are divided into two categories, depending on whether or not the roots of the given verb and the substitute have the same transitivity status. Unacceptable substitutions differed substantially in meaning from that of the given verb, often failing to make sense in the discourse context. Table 1 presents a summary of the percentages of every response type

provided by all the child participants for each of the 10 verbs, categorized on the table as result states (including basically transitive and intransitive roots) and property states.

Table 1: *Percentages for every response type for each of the 10 target verb roots*

N = 29	RESULT STATES								PROPERTY STATES	
	TRANSITIVE					INTRANSITIVE				
	kicha-	phuku-	kacha-	t'ikra-	thiqti-	qoñi-	chinka-	rikch'a-	api-	qhilli-
	open	put out	untie	over-turn	fry	warm	lose	awaken	wet	dirty
Correct form	96.6	79.3	79.3	75.9	31.1	75.9	65.5	72.4	62.1	75.9
Incorrect form	---		3.5	3.4	37.9	3.5	13.9	27.6	10.3	17.2
Good substitution; same transitivity	---	---	3.4	13.8	6.9	6.9	---	---	---	---
Good substitution; different transitivity	---	10.3	---	---	---	---	---	---	---	---
Inappropriate substitution	3.4	6.9	13.8	6.9	20.7	10.3	17.2	---	24.1	3.4
No response	---	3.5	---	---	3.4	3.4	3.4	---	3.4	3.4

With respect to the incorrect verb forms produced by the children, only 12 verb forms were uninflected roots, produced by 7 children, as shown in Table 2, by verb type. The table indicates that most of the bare roots were produced for basically intransitive and property state verbs.

Table 2: *Summary of bare-root responses produced by 7children by type of verb*

Age in months	Transitive	Intransitive	Property State

34	1		
35	1	1	1
42		1	1
43			1
48		1	
50		1	2
53		1	
TOTAL:	2	5	5

For the purpose of investigating developmental change, participants were divided into two age groups, henceforth labelled Older Children and Younger Children. The group of younger children comprised 12 two- and three-year-olds (Mean Age = 3;6), while the older children included 17 four-years-old (Mean Age = 4;5). The percentages of correct verb forms produced by each age group, herein, Target, were computed for the three categories of verbs: transitive, intransitive, and property state. It was decided that substituting a nearly synonymous root requiring exactly the same morphology in the transitive variant was a perfectly acceptable response in the given test situation. For this reason, the sum of the percentages of correct verb forms and acceptable substitutions using forms with the same transitivity status, henceforth, Target+Sub, was also calculated for each age group.

Multiple paired-samples t-tests were computed to determine differences in the number of correct forms produced by all the children for all possible pairs of the 10 individual verbs. The mean of correct forms was significantly higher for one of the basically transitive roots, *kicha-* 'open', than those of all the other verbs. In like manner, the mean of correct forms was significantly lower for one of the basically intransitive roots, *thiqti-* 'fry', than those of all the

other verbs. The outcome of this analysis suggests that *kicha-* 'open' might be more familiar to the children than the other verbs, and, *tiqti-* 'fry', less familiar. For this reason, a third variable was computed, Revised Target-Sub: the sum of the percentages of correct verb forms and same-transitivity substitutions for all verbs except *kicha-* and *thiqti-*. The outcome of these computations is presented in Table 3.

Table 3: *Percentages by age group and verb type: (1) target forms; (2) sum of target forms and same transitivity substitutes; (3) sum of target forms and same-transitivity substitutes, excluding* kicha- *and* thiqti-

		Age Group		
		Older	Younger	Total
	Verb Type	N = 17	N = 12	N = 29
Appropriate target forms [TARGET]	Transitive	82.4	83.3	82.8
	Intransitive	67.7	52.1	61.2
	Property state	82.4	50.0	69.0
Sum of appropriate target forms and same-transitivity substitutions [TARGET+SUB]	Transitive	88.2	85.4	87.1
	Intransitive	73.5	52.1	64.7
	Property state	82.4	50.0	69.0
Sum of appropriate target forms and same-transitivity substitutions, excluding *kicha-* and *thiqti-* [REVISED TARGET+SUB]	Transitive	84.3	83.3	83.9
	Intransitive	82.4	61.1	73.6
	Property state	82.4	50.0	69.0

Three separate mixed within-between subjects ANOVAs were conducted to examine the performance of the two age groups for each category of verb (i.e., transitive root, intransitive

root, property state), considering (a) Target, (b) Target+Sub and (c) Revised Target+Sub. In each analysis, age group was the between-subjects variable and verb type was the within-subjects variable. The outcomes of these analyses are presented in Table 4.

Table 4: *Mixed within-between subjects ANOVAs examining age group and verb type*

	Between-subjects	Within-subjects	
	[age group]	[verb type]	[verb type x age group]
	F (1, 27)	F (2, 54)	F (2, 54)
TARGET	4.45, p <0.05	8.15, p < 0.005	4.02, p < 0.05
TARGET+SUB	7.73 p <0.05	11.26, p < 0.001	3.71, p < 0.05
REVISED TARGET+SUB	6.54 p < 0.05	4.76, p < 0.05	3.70, p < 0.05

With respect to the between-subjects analyses, in each case there was a main effect of age group indicating that the older children performed significantly better on average than the younger children. When examining the within-subjects factor of verb type, there was also a main effect in each analysis. However, this cannot be understood in and of itself since there was also a significant interaction between verb type and age group: relative performance on each verb type differed depending on whether the children were younger or older. Figures 1 and 2 represent the interactions of verb type and age group, respectively, when Target and Target+Sub were considered. The graphs show that the pattern of performance is similar, whether or not the calculation includes acceptable substitutions with the same transitivity status. In both cases, the younger children performed as well as the older children on the basically transitive verbs. While the older children performed almost equally well on the transitive and property state verbs, the younger children did not perform nearly as well on the property state verbs as on the transitive verbs. Finally, all the children were less successful producing the target forms for the intransitive verbs than for the transitive verbs.

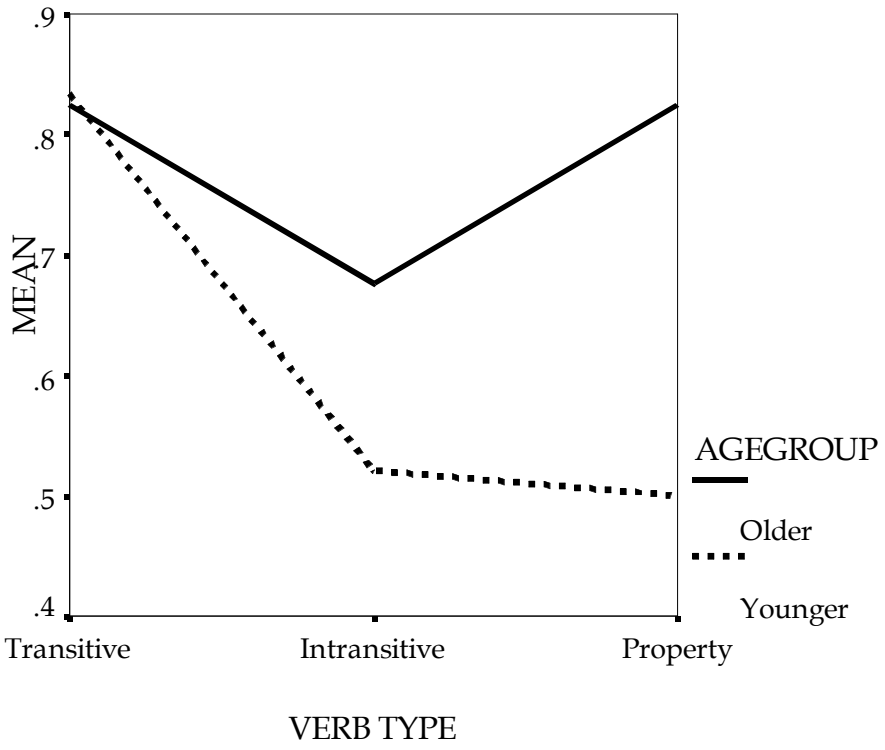

Figure 1: *Interaction of verb type and age group, considering correct Target forms*

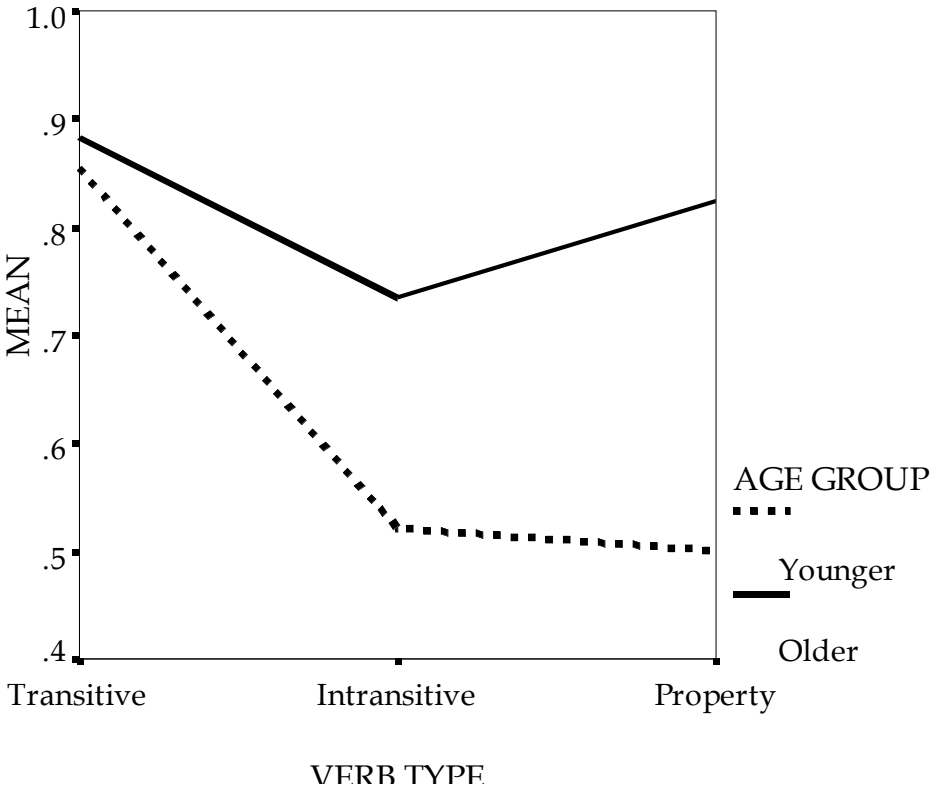

Figure 2: *Interaction of verb type and age group, considering the sum of Target forms and same-transitivity substitutions*

To determine differences in performance for the three different verb categories, independent t-tests were computed, with Target+Sub as the dependent variable and Age Group as the independent variable. These tests yielded significant differences for two of the verb categories, with the older children outperforming the younger children in each case: property states ($t(27) = 2.84$, $p < 0.01$) and intransitive roots ($t(27) = 2.42$, $p < 0.05$). The difference in the percentages for the transitive roots was not significant. This means, as suggested in Figures (1)-(2), that the younger and older children performed equally well in their responses for the category of basically transitive verb roots.

With respect to the interaction of age group and verb type in the analysis for Revised Target-Sub, Figure 3 shows that the exclusion of *thiqti-* from the group of basically intransitive

verbs resulted in a big difference for the older children but not for the younger children. Now, the performance of the older children is similar for all three types of verbs, while the younger children continue to be more successful on the transitive verbs than on the other two types.

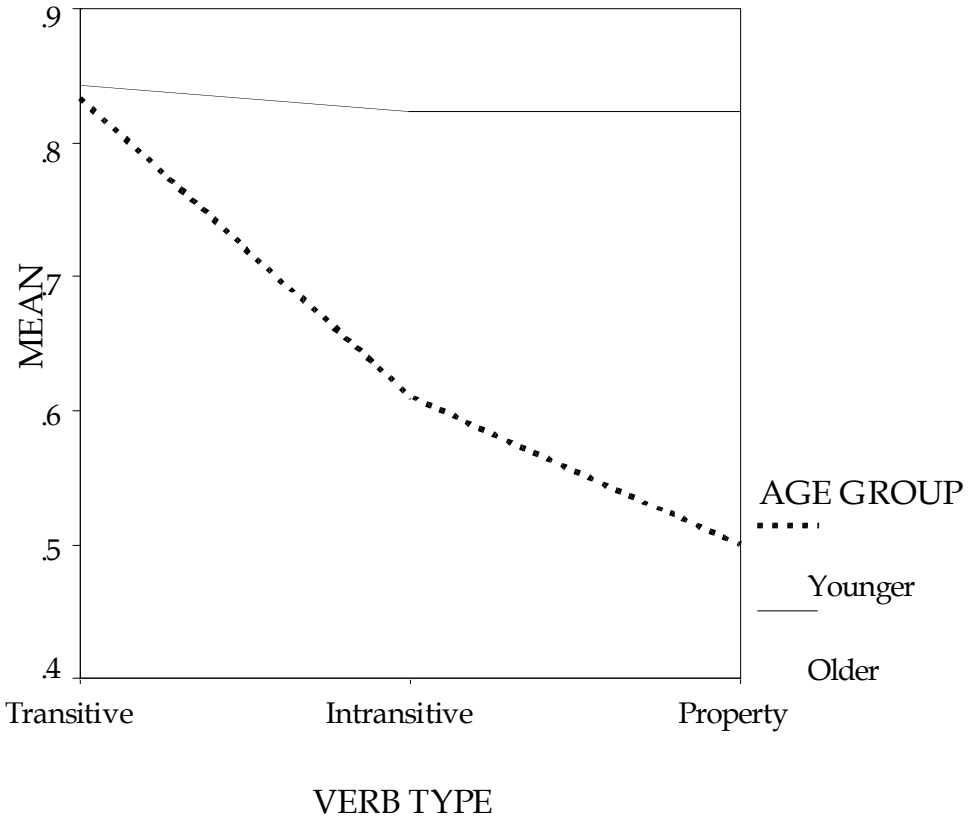

Figure 3: *Interaction of verb type and age group, considering sum of Target forms and same-transitivity substitutions, excluding* kicha- *and* thiqti-

Property States

For the 2- and 3-year-olds, producing the transitive variants of property states presented a particular challenge. By contrast, the 4-year-old children had no more difficulty producing the correct forms of property state verbs than they did producing the transitive variants of result state verbs. Their success is most likely attributable to their having learned the corresponding factitive verbs. All the correct responses were factitive verb stems, i.e., *api-cha-* 'make wet' and *qhilli-cha-* 'make dirty', rather than causativized stems bearing the combination,

/-ya-chi-/. One child, aged 3;9, attempted to produce a causativized stem for both verbs, but he failed to append the required transformative suffix *-ya-*'become' before attaching causative *-chi-*, as in the following response:

(11) Pi-n pampa-ta *api-___-chi-ra-n.

who-EVID floor-ACC wet-CAUS-PAST-3

Intended: 'Who wet the floor?'

Since this child was the only participant who attempted the productive morphological process available in Quechua for forming the transitive variants of property states, it is possible that children do not acquire the process until later. In that case, children would have to have learned the equivalent factitive verbs in order to provide correct responses on the test.

For the property state *api-* 'wet', 7 children (5 younger and 2 older) substituted the verb *hich'a-* 'pour', as in the following sample responses:

(12) a. Pi-n aha-ta hich'a-ra-n.

who-EVID chicha-ACC pour-PAST-3

'Who poured the *chicha*?" [*chicha* = a native beer made from corn]

b. ??Pi-n pampa-ta hich'a-ra-n.

who-EVID floor-ACC pour-PAST-3

'Who poured the floor?'

For the prompt meaning, 'Look! The floor is wet', four children produced responses similar to (12a), meaning 'Who poured the chicha?' This response type is marginally acceptable in the given scenario. However, three children produced anomalous responses such as that provided in (12b), meaning 'Who poured the floor?' These responses suggest some difficulty in learning the semantic structure of *hich'a-* 'pour'. An error such as *pour the floor* is reminiscent of the *pour the glass* error discussed by Gropen, Pinker, Hollander & Goldberg (1994), who noted that

English-speaking children are more likely to produce erroneous **fill the water* predicates than **pour the glass* predicates. Although we might not anticipate errors in children's use of a change-of-location verb meaning 'pour', we know that English-speaking children have difficulty with endstate verbs such as English *fill*. English *fill*, like Quechua *api-cha-* 'wet' is a transitive change-of-state verb derived from a property state.

Overgeneralization Errors: Result States

These findings suggest that 4-year-old children are successful at producing the transitive variants of both basically transitive and basically intransitive result state verbs. Additionally, while 2- and 3-year-old children correctly interpret the basically transitive verbs as describing events that are externally caused, they may overgeneralize this construal to change-of-state verbs that are inherently interpreted as occurring spontaneously. It might be argued that the younger children mistakenly produced intransitive forms during the test in their attempts to provide the transitive-causative variants because these forms are morphologically simpler. For example, intransitive *rikch'a-* 'wake up' is morphologically simpler than the required causativized form, *rikch'a-chi-*, whereas the transitive-causative form of *t'ikra-* 'overturn' requires no additional morphology. On looking more closely at the children's responses, one may refute such an argument:

- Although children produced a few bare roots (Table 2), most of their erroneous responses for the basically intransitive verbs were morphologically complex forms that were missing only the causative suffix. The verbs in the data samples shown in (13), both produced by younger children, are highly inflected, even though they lack *-chi-*, as indicated in each example by an underlined space.

(13) a. Pi-n runtu-ta *thiqti-ru-___-ra-n.

who-EVID egg-ACC fry-EXH-PAST-3

*'Who fried (intransitive) the egg?'

b. Pi-n wawa-cha-ta *rikch'a-____-sha-ra-n.

who-EVID baby-DIM-ACC awake-PROG-PAST-3

*'Who woke up (intransitive) the baby?'

These examples indicate that morphological complexity does not represent a challenge to these children.

- Only one child inappropriately causativized a basically transitive verb root; here, affixation of *-chi-* results in a more complex form indicating an additional argument:

(14) *Pi-n tiyana-ta t'ikra-chi-ra-n.

who-EVID chair-ACC overturn-CAUS-PAST-3

*'Who made someone overturn the chair?'

- None of the children failed to causativize all four intransitive verbs. Even the youngest child [2;8] produced the appropriate transitive variants of the basically intransitive verbs half the time, as exemplified in his two correct responses:

(15) a. Pi-n oveja-ta chinka-ra-chi-ra-n.

who-EVID sheep-ACC disappear-EXH-CAUS-PAST-3

'Who lost [=caused to disappear] the sheep?'

b. Pi-n caldu-ta quñi-chi-n.

who-EVID soup-ACC warm-CAUS-3

'Who's warmed the soup?'

These facts suggest that children actually overgeneralize the argument structure of basically transitive verb roots to basically intransitive verb roots—they do not merely experience processing difficulty brought on by morphological complexity.

Discussion

The outcome of this formal elicitation procedure corroborates the findings in Courtney's (2002) analysis of naturalistic data: the pattern of overgeneralization errors produced by Quechua-speaking children shows the same asymmetry observed elsewhere. Like children acquiring other languages, Quechua-speaking children use intransitive verb forms as causative-transitives more frequently than they use transitive verb forms as intransitives. To account for this asymmetry, Montrul (2001) suggests that children may have a fallback strategy when they are uncertain about the lexico-syntactic representation of a verb: they adopt the bi-eventive (dyadic) template of an accomplishment as the default because they perceive it as the most basic of the UG inventory. This template corresponds to the lexical-semantic representation discussed previously: [x CAUSE [BECOME [y <*STATE*>]]]. Montrul proposes that children incorrectly hypothesize that all unaccusative verbs are dyadic predicates because of this default strategy. The need for such a strategy is plausible. As noted by Rispoli (1995: 338-9), 'it is entirely unclear what a 2-year-old child understands about intentional and natural causation.' However, while this account is reasonable, it begs the question why children should perceive the dyadic template as the most basic.

Courtney (2002) suggests that children may initially construe alternating change-of state verbs as expressing changes that are externally caused because this is the universal tendency (Levin & Rappaport Hovav, 1994, 1995). That is, cross-linguistically, these verbs tend to be basically transitive (dyadic), therefore construed as expressing external causation. This is an extension of Pinker's (1984) proposal that children are innately constrained to hypothesize those

features that are the most prevalent across languages. With specific reference to Quechua, children have no difficulty manipulating the transitive and intransitive variants of verb roots that express dynamic events brought about intentionally by agents (e.g., *sipi-* 'kill') or unergative verb roots that express dynamic events that are clearly spontaneous (e.g., *asi-* 'laugh'; *puri-* 'walk). Perhaps the alternating change-of-state verbs are particularly challenging because changes of state are not as salient to children as dynamic events.

LEARNABILITY ISSUES IN QUECHUA VERB-LEARNING

Quechua is a nominative-accusative language with very regular agglutinating morphology, flexible word order, and frequent argument ellipsis. Subjects, when explicit, are in nominative case (zero morpheme), and direct objects uniformly bear the accusative case marker /-ta/. As shown in (16)-(19), infinitival complements are also marked in accusative case, as are adverbs of manner and direction.

(16) Juan m'iski-ta muna-n.
Juan candy-ACC want-3
'Juan wants candy.'

(17) Juan puklla-y-ta muna-n.
Juan play-INFIN-ACC want-3
'Juan wants to play.'

(18) Juan asiy-ta puri-n.
Juan slow-ACC walk-3
'Juan walks slowly.'

(19) Juan llaqta-ta puri-n.
Juan town-ACC walk-3
'Juan walks to town.'

Quechua-speaking children are attuned to the participants in events: they distinguish the subject and complement morphologically, even when they fail to produce the verb, either because they do not know the particular verb or have difficulty retrieving it. In the following typical utterances from a corpus of naturalistic speech produced by two-year-old children (Courtney, 1998), the subject is the first-person pronoun, *noqa*, and different types of accusative complements are marked in accusative case.

	Utterance	Intended
(20)	Noqa kaldo-ta	
	I soup-ACC	'I (cook) soup.'
(21)	Noqa wasi-ta	
	I house-ACC	'I (walk) to the house.'
(22)	Calli-ta noqa puri-y-ta	
	street-ACC I walk-INFIN-ACC	'I (want) to walk to the street.'
(23)	Platu-ta noqa *quiero*	
	money-ACC I want-*Spanish*	'I want money.'

It is likely that two constraints work in tandem to help children discriminate external and internal arguments: (1) morphological cueing (e.g., the accusative suffix on most verb complements) and (2) the conceptual-semantic prominence of the subject and object categories (Gropen, Pinker, Hollander & Goldberg, 1994; Fisher & Song, 2006). Nonetheless, syntactic bootstrapping would not provide much information about the transitivity status of Quechua verb roots. This is because an unergative-intransitive verb such as *tusu-* 'dance' or *puri-* 'walk' may have an accusative-marked constituent in its syntactic environment:

(24) Sumaq-ta tusu-n.

very well-ACC dance-3SG

'He/she dances very well.'

(25) Wasi-ta puri-n.

House-ACC walk-3SG

'He/she walks to the house.'

Even the so-called object-marking morphology (1st- and 2nd-person only) is an unreliable indication of transitivity[2]:

(26) Maqa-wa-n.

hit-1OBJ-3

'He/she hits me.'

(27) Hamu-wa-n.

come-1OBJ-3

'He comes towards me/my way.'

Verb forms bearing the causative marker /-chi-/ are always transitive because whenever this suffix is appended to a verb root/stem, an internal argument is added. However, because of the possibility of argument ellipsis in Quechua, the number of internal arguments is not necessarily revealed by the morphosyntactic environment, as illustrated in (28)-(29).

(28) Juan sara-ta mikhu-chi-n.

Juan-NOM corn-ACC eat-CAUS-3SG

'Juan makes (someone) eat corn.'

[transitive root - 3 arguments]

Juan wawa-ta puri-chi-n.

Juan-NOM child-ACC walk-CAUS-3SG

'Juan makes the baby walk.'

[intransitive root - 2 arguments]

In these two examples, each causativized verb root appears with an accusative-marked internal argument. In the first case, the explicit argument is the direct object of the lower clause, while, in the second, the explicit argument is the causee. As shown in the examples in (29), even the addition of the first person-of-object morpheme, /-wa-/fails to elucidate the argument structure of the verb roots.

(29)	Foto-chi-wa-n.	Puri-chi-wa-n.
	photograph-CAUS-1OBJ-3SG	walk-CAUS-1OBJ-3SG
	'He/she makes someone photograph me.'	'He/she makes me walk.'
	'He/she makes me photograph someone.'	
	[transitive root - 3 arguments]	[intransitive root - 2 arguments]

None of these forms presents morphosyntactic cues that would help a child zoom in on the transitivity status of the verb root itself. Children must have to rely on a semantic-conceptual strategy. Following Gropen, Pinker, Hollander & Goldberg (1994), they single out the affected entity in the main event and link it to the direct object. It is plausible that, in this way, Quechua-speaking children are able to distinguish the direct objects of transitive verbs with agentive subjects from the directional complements of intransitive verbs of motion. They are able to do so because directional complements are not affected objects.

Change-of-state verbs: recovery from overgeneralization errors

We have seen that the pattern of overgeneralization errors produced by Quechua-speaking children shows the same asymmetry observed in children acquiring other languages: Quechua-speaking children use intransitive verb forms as causative-transitives more frequently than they use transitive verb forms as intransitives. Children appear to start off with a default interpretation, whereby change-of-state verbs are dyadic predicates expressing externally caused events brought about under volitional control of agentive subjects. How do Quechua-

speaking children recover from these patterns of overgeneralization? How do they sort out the lexical semantic structures of change-of-state verbs? Again, the answer may lie in children's attention to both morphosyntactic cues and semantic factors.

A reliable source of information is the imperative. Children attend to directives, and, in Quechua directives with transitive imperatives, the direct object is frequently expressed. If children are instructed to untie the cows (*Wakakuna-ta kachari-y*) or are warned not to lose the money (*Ama qolqeta chinka-chi-y-chu*), they have clear morphosyntactic evidence that *kachari-* 'untie' and *chinka-chi-* 'lose' are transitive forms. Quechua child-directed speech abounds with such directives. Several mother-child conversations were recorded at children's homes in rural communities outlying the city of Cusco, Peru. One of the conversations, between a mother and her child, aged 2;11, included 110 utterances produced by the mother, of which 60 (55%) contained directives. In the following examples, (29)-(39), from the same corpus of mother-child conversations, the ages of the children are indicated, and the directives they receive from their mothers are underlined. These include imperatives, verbs inflected in 2nd-person future and conditional, and verbs in 1st-person plural future. As shown in the examples, the directives are primarily instructions for chores to be done, and Quechua-speaking mothers often repeat directives for their children.

(29) 2;6 Lllant'ata <u>aparawanki</u>. Ninata <u>yawrarachimunki</u>.

'You'll fetch me firewood. You'll get the fire burning.'

(30) 2;11 Pichanata <u>apakamuy</u> wasita pichanaykipaq.

'Fetch the broom so you can sweep the house.'

(31) 2;11 Papichata <u>wahamuy</u>. Papichata <u>waharamunki</u>.

'Go and call your daddy. You'll go and call your daddy.'

(32) 3;1 Carrupi <u>pukllamusun</u>. Carruykiwan <u>pukllay</u>.

'Let's play in the car. Play with your car.'

(34) 3;4 Pastuchata apamunki, wasinta pichanki.

'You'll bring hay, and you'll sweep throughout the house.'

(35) 3;4 Papa bondayta yanapawanki.

'You'll help me peel the potatoes.'

(36) 4;0 Sayariy, sayariy. Uwihanchista qhawariramusunchis.

'Get up, get up. Let's go and take a look at our sheep.'

(37) 4;0 Ankayman papataqa churay. Ankaypataman churay.

'Put the potatoes here. Put them on top of this.'

(38) 4;0 Uwihata qatirakamuwaq riki.

'You really should go and herd the sheep.'

(39) 6;1 Wakanchista qhawasawaqchu. Aman dañuchinkichu.

'Would you take a look at our cows? You won't let them damage anything.'

If children incorrectly hypothesize that the unaccusative-intransitive root, *t'impu-* 'boil' is transitive, attending to the transitive variant provided in the directive, *t'impuchiy unuta* 'boil the water', will help them recover from error, as long as they notice that the verb root bears the causative suffix /-chi-/. At work here is the Principle of Uniqueness (Naigles & Lehrer, 2002), which operates by preventing more than one form being assigned the same meaning.

With regard to semantic constraints, recovery from overgeneralization may also involve children's paying attention to the properties of each verb's external and internal arguments when the verb is used in its basic form. Levin (1993: 246-7) explains that basically intransitive change-of-state verbs are entity-specific; that is, they denote changes that 'often cannot be directly caused, but rather are inherent to the entities that undergo them.' A case in point is the

verb *t'impu-* 'boil-INTRANSITIVE'. The only possible subjects of this verb are inanimate entities that can change from a liquid to a vapor. By contrast, for verbs whose basic forms express events interpreted as externally caused, there are few restrictions on the entities that can occur as subjects (McKoon & Macfarland, 2000). Children are biased to expect subjects to be animate, mobile entities (Fisher & Song, 2006), but young Quechua speakers must eventually notice that basically intransitive change-of-state verbs present an exception.

CONCLUSION

This study presents corroborating experimental evidence that Quechua-speaking two- and three-year-olds have not yet fully acquired the argument structures of change-of-state verbs, and they produce the same asymmetrical pattern of overgeneralization errors as children acquiring other languages. They appear to adopt a dyadic template for all change-of-state verb roots, even though many Quechua change-of-state verb roots are basically unaccusative-intransitive. If, as Montrul (2001) has proposed, this is a default strategy, children may select the transitive template because it is less marked cross-linguistically (Levin & Rappaport, 1995, 1998). However, another factor in children's adoption of the transitive template may be their expectation that subjects are animate entities with prominent roles in dynamic events (Fisher & Song, 2006). It is therefore plausible that children have particular trouble with Quechua change-of-state verbs because changes of state are not salient events, and, for many of the Quechua verbs, subjects are inanimate and entity-specific.

Syntactic bootstrapping, which relies on the presence of explicit arguments in the verb's syntactic environment, is perhaps less helpful to children acquiring a language with frequent argument ellipsis and flexible word order than it is to young English and French speakers. Because of the nature of Quechua morphosyntax, children must also have to make use of morphological cues and the semantic-conceptual features of arguments, whenever these are

explicit. In this regard, the many directives available to Quechua-speaking children in caretaker speech provide valuable input, as long as children pay attention to the morphology of the verb stems used in the directives, e.g., with or without Causative /-chi-/. Thus, in verb-learning and recovery from error, Quechua-speaking children probably rely on a combination of morphosyntactic cues and semantic information. This is a working hypothesis, one that calls for fine-tuned experimental studies, such as those undertaken for English-speaking children.

ENDNOTES

[1] The terms represented by abbreviations in the interlinear glosses are provided in the Appendix.

[2] Adelaar (1986: 496) notes, 'Person-of-object markers are primarily selected for the identification of a NONSUBJECT PARTICIPANT in the speech act. This participant is human by definition, or at least animate, and equals or includes the speaker, the addressee, or both.'

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APPENDIX

Terms for abbreviations used in interlinear glosses

NOM	Nominative	---
ACC	Accusative	*-ta*
DAT	Dative	*-man*
LOC	Locative	*-pi*
INSTR	Instrumental	*-wan*
DIM	Diminutive	*-cha*
1	1st-person Present	*-ni*
2	2nd-person Present/Future	*-nki*
3	3rd-person Present	*-n*
3FUT	3rd-person Future	*-nqa*
1OBJ	1st-person Object	*-wa-*
PAST	Past Tense	*-r(q)a-*
PROG	Progressive	*-sha-*
INFIN	Infinitive	*-y*
REFL	Reflexive	*-ku-*
CAUS	Causative	*-chi-*
REG	Regressive	*-pu-*
EXH	Exhortative	*-ru-*
FACT	Factitive	*-cha-*
TRANS	Transformative	*-ya-*
EVID	Evidential	*-mi/-n*
INTERR	Interrogative	*-chu*