

Reference to contexts in Zuni temporal and modal domains

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Counterfactual interpretation is constructed from two evaluation contexts plus morphology that indicates that the worlds in one of these contexts are located outside the other context serving as a basis of reference (Nichols 2003a). In Zuni (and English), the morphology used to indicate this relation between contexts is also used for 'past' temporal reference. This study argues that 'past' morphology in its temporal interpretation shares the same basic meaning as the modal cases: past tense specifies the type of relationship between a Reference Context and some other context of evaluation. While in English the temporal Reference Context is the Utterance Context, Zuni allows the temporal Reference Context to be shifted away from the Utterance Context. In addition to the argument that tense interpretation involves reference to contexts, the study makes the case for detailed studies distinguishing language-specific morphological idiosyncrasies from the semantic properties that form the core of the counterfactual conditional construction.

1. Introduction

In recent work (Nichols 2002, 2003a,b) I have argued that counterfactual interpretation of a proposition has at least three components: the context set of worlds serving as the basis of comparison (ordering source; Kratzer 1991, Lewis 1973), the context set of worlds in which the truth of the proposition is evaluated, and morphology that indicates the relationship between these two context sets. The semantic contribution of the morphology is constant across conditional types; differences between true contrary-to-fact vs. hypothetical interpretation fall out straightforwardly from the nature of the context sets involved. Languages may differ in the particular morphological solution they choose for the indication of this relationship of the two contexts (e.g. tense; aspect; attitudes), but the form of counterfactuals and hypotheticals are by and large expected to display a similar pattern crosslinguistically.

The morphological expression of counterfactuality in Zuni departs in at least two ways from more familiar patterns of counterfactual conditional form such as those in English. In this study I show that Zuni counterfactuals can indeed be understood in terms of the analysis of counterfactuality sketched above, the differences being attributable to (a) a language-specific semantic property involved in the determination of temporal

reference in Zuni, and (b) a second semantic property of scope specific to Zuni morphology itself. This investigation builds on work by Klein (1994), Klein et al. (2000) suggesting that tense morphology refers to topic times rather than event times. Here I argue that the notion 'topic time' might more accurately be characterized as 'assertion context'.

This study illustrates that the above analysis of the source of counterfactual interpretation allows us to successfully distinguish language-specific morphological idiosyncrasies from the semantic properties that form the core of the counterfactual conditional construction. That is, it may be possible to attribute variation in counterfactual conditional form crosslinguistically to a small set of language-specific differences in morphemes involving temporal anchoring (as discussed in the present study), attitude composition, and tense/(ir)realis reference. The claim is that counterfactuals may draw from the same semantic principles but, depending on individual details, they may look quite different on the surface given the morphological resources that a particular language brings to bear on the problem.

2. Double-marked vs. Single-marked Counterfactuality

Example [1] illustrates the form that counterfactual conditionals take in English, [1a] a present counterfactual and [1b] a past counterfactual.

- [1] a. If John were rich, he would be happy.
 b. If John had taken the medicine, he would have gotten better.

Three properties of these constructions are of interest here. First, as illustrated most clearly by the *be* + past form of the present counterfactual verb in the protasis of [1a], counterfactuality is marked by what can be called for now the modal use of 'past' morphology. Second, counterfactuality with respect to the current utterance time is marked with a single instance of past morphology, in [1a] *be* + *past*, while past counterfactuality is marked with two instances of past morphology, in [1b] *take* + *perfect have* + *past*. Third, the modal 'past' morphology in English counterfactuals appears in both the protasis subordinate clause and apodosis main clause.

Turning to the form of Zuni past counterfactuals in [2], we can see that Zuni shares the first property, namely that modal 'past' morphology – here the verbal suffix *-kya*, is used in the expression of counterfactuality in Zuni conditionals as well. Example [3] illustrates the indicative use of this tense suffix.

- [2] wish – apc'i – nap – ka – tappa kok^w – 'an towo – 'a – ti – k'ya – nnaN – kya
 neck – cut – pl.subj. – PAST – sub. katchina-to shoot-punct.-inch.-caus.-IRR. – PAST
 "If they had cut his throat, he would have shot the Katchinas" (Bunzel 87.93)
- [3] koyemshi yam nana homachi yate – kya
 mudheads refl.poss. grandchild H. catch –PAST
 'Koyemshi seized his grandchild Homachi.' (Bunzel 86.91)

The second and third morphological properties of English counterfactuals do not hold for Zuni, however. As [2] indicates, in contrast with English, past counterfactuality in Zuni is indicated via only a single past morpheme *-kya* in each of the clauses of the conditional. (I will lay aside discussion of Zuni present counterfactuals, since unlike English these appear to take a form identical to simple conditionals, with a plain protasis and irrealis suffix on the apodosis, cf. example [4] vs. [5] below. The interpretation(s) of irrealis morphology on the apodosis appears to be the source of this ambiguity.)¹

- [4] tewana:we k'ecca – na – ppa ... hon chuw yu' - hatiya: - k'ya - nna
 daily happy - stat. – sub. ... 1pl.nom. who indef. – hear - caus. - IRR.
 "If we were always happy, we would listen [for that which we wish]"
 (Bunzel 56.76)
- [5] hon 'a:chi ayna - na:w - ap kop lilh'k'on leya te - k'yanna
 1pl.nom. dual kill - pl.subj. – sub. what here hold be - IRR.
 'If we kill them now, what will happen?' (Bunzel 137.96)

There is a fourth difference in the form of English vs. Zuni counterfactual conditionals, illustrated below. This property of Zuni counterfactuals is the central concern of this study. In Zuni, past counterfactuals sometimes take a form identical to present counterfactuals/simple conditionals; compare this alternative past counterfactual in [6] to the present counterfactual in [7]. The difference in interpretation is clear from context ([6] is uttered in a story about a set of past events), but both protasis and apodosis bear the same morphology: simply subordinating morphology in the protasis *-p(pa)* and an irrealis suffix *-nna* in the apodosis.

- [6] hish 'akcek'i c'ana 'ash – e – p kok^w 'ash - e - nna
 very boy small die – cont. – sub. katchina die - cont. - IRR.
 "If the little boy had died, the katchinas would have died" (Bunzel 87.94)
- [7] tewana:we k'ecca – na – ppa ... hon chuw yu' - hatiya: - k'ya - nna
 daily happy - stat. – sub. ... 1pl.nom. who indef. – hear - caus. - IRR.
 "If we were always happy, we would listen [for that which we wish]"

Past counterfactual examples [2] and [6] therefore have different morphological form, with only the former bearing overt 'past' morphology, modal 'past' (in the protasis)

¹ Hypotheticals, e.g. [i] below, are morphologically identical in English to counterfactuals, cf. [ii]. Hypotheticals in Zuni are identical to these 'unmarked' present counterfactuals, a clause initial particle contributing the additional modal attitude meaning, [iii]. The use of these modal particles is in line with the general treatment of attitude evaluation in Zuni grammar, where clausal attitude subordination of the sort illustrated in [iv] for English is not possible in Zuni.

- [i] [We don't know anything about John's financial status, but ...]
 If John were rich, he would be happy.
- [ii] [We know that John has not money, but ...]
 If John were rich, he would be happy.
- [iii] ma'sh ho' pen - ap 'isnok'on ton tse'ma - nna
 well-Q. I.nom. speak – sub. there you.2.nom. think- IRR.
 "If I said that, you might think that were true"
- [iv] John thinks that Mary left.

and real 'past' (in the apodosis) morphology, yet both have a similar past counterfactual interpretation. In what follows I will argue that the form of the Zuni past counterfactual in [6] is not due to a peculiarity of counterfactual composition or interpretation in Zuni; counterfactuality in Zuni can be shown to take canonical form in all cases. Rather, some property of Zuni temporal reference different from English makes past morphology in the past counterfactual optional in certain contexts. Interestingly, it is not just the indicative usage of 'past' that is affected by this aspect of temporal reference, since the modal use of 'past' in the apodosis is also absent from [6] but required in [2].

The following section reviews the discussion of the semantic composition of counterfactual interpretation from earlier work, which makes the case that modal use of past morphology specifies a particular kind of relationship between context sets for the truth evaluation of a proposition. The subsequent section will make the argument that the behavior of Zuni tense marking can also be attributed to the same basic meaning of reference to contexts (rather than something like reference times, as in the view of e.g. Reichenbach 1947, Hornstein 1990, Comrie 1985). Thus 'past' morphology both in Zuni and in English share the property of exhibiting the same basic meaning in both modal and non-modal domains, though the two languages ultimately part ways, however, in how contexts may be referred to in the non-modal domain.

3. The Nature of Counterfactual Interpretation

The truth value of any proposition is determined with respect to some context. Contexts consist of sets of worlds (sets of sets of propositions) in which the proposition may be evaluated. Ordinarily, the worlds in which the truth of a proposition is to be evaluated are specified by a selection function, determined by the conversational background or else speaker's attitude (more on this below).

It is argued in Nichols (2003a,b) that counterfactual interpretation arises from an evaluation with respect to two types of contexts, the context serving as the basis of comparison (essentially the ordering source² of Kratzer 1991, Lewis 1973 but figuring into the interpretation somewhat differently than in those discussions) and the context in which the truth of the proposition is evaluated. The evaluation context serving as the point of reference may be the common ground context set, the set of all propositions assumed by the participants at the start of the conversation³, or this context set may consist of a subset of the common ground as determined by the speaker's attitude, e.g. what the speaker expects, what the speaker knows about X, etc. The final component of counterfactual interpretation is the semantic contribution of the morphology in counterfactual conditional clauses. This morphology indicates the nature of the relationship between these two evaluation contexts with respect to a particular proposition. In English (and Zuni) a 'past' morpheme is used for this function, as in [8] below.

² The term 'ordering source' may be understood to refer either to the ordering selection function over worlds or for the values assigned by this function; here the term is primarily used in the latter sense, to refer to the set of worlds determined by this function.

³ This common context set is vague (Lewis 1973, Stalnaker 1978) rather than precise, assumed to specify those propositions/worlds relevant to the current conversational context and vague on the content of the remainder.

Specifically this 'past' marks a proposition as evaluated as consistent with a context set of worlds that lie *outside* the reference context set. The interpretation of the conditional will then straightforwardly follow from the nature of the reference context set. In the case that the reference set is the entire common ground, 'past' indicates that P is evaluated as true only in worlds outside the common ground and so receives contrary-to-fact interpretation. This is the source of the counterfactual interpretation for the protasis in English example [8] and Zuni example [9] (repeated from [2] above).

[8] **Protasis has counterfactual interpretation:**

[We know that John has no money, but ...]
If John were rich, he would be happy.

- [9] wish – apc'i – nap – ka – tappa kok^w – 'an towo – 'a – ti – k'ya – nnaN – kya
neck – cut – pl.subj. – PAST – sub. katchina-to shoot-punct.-inch.-caus.-IRR. – PAST
"If they had cut his throat, he would have shot the Katchinas" (Bunzel 87.93)

Alternatively, the reference context set may be a proper subset of the common ground, determined by speakers attitude, e.g. in the case of [10], containing worlds characterized by propositions true with respect to *what we know about John*.

[10] **Protasis has hypothetical interpretation:**

[We don't know anything about John's financial status, but ...]
If John were rich, he would be happy.

'Past' morphology here indicates that protasis proposition P *John is rich* is evaluated as true (or more precisely, consistent) only in a set of worlds outside this set, i.e. it may be that P or ~P in these worlds, we just don't know. Thus, in the case (like [10]) where the reference context is a subset of the common ground, the conditional protasis receives a hypothetical rather than contrary-to-fact interpretation. (Evidence for hypothetical interpretation comes from the fact that the counterfactuality of the protasis in [10] can be subsequently asserted without redundancy, cf. *If John were rich, he would be happy. Since he always seems depressed, he doesn't have any money.*)

We might assume that the specified reference set functions as an ordering source in indicating that not all worlds outside the reference set are considered for the evaluation of proposition P, rather worlds are considered while remaining as close to the common ground as possible. Hence, where this reference context set is a subset of the common ground, P is evaluated in worlds that are outside the reference set but within the common ground. Hypothetical interpretation with respect to the common ground is therefore directly related to the choice of the reference context as a proper subset.

Counterfactual and hypothetical propositions in English are marked in identical fashion with this 'past' morphology, as indicated by examples [8] vs. [10]. The resulting counterfactual or hypothetical interpretation falls out directly from the character of that reference context set. In this study I will only be concerned with cases of true contrary-to-fact conditionals (where the context set for the truth evaluation of P lies outside the entire common ground).

Finally, the morphological patterns in counterfactuals also depend on the nature of the semantic relationship between the protasis and apodosis.

In a simple conditional such as *If John takes the medicine, he will get better*, the apodosis prediction *Q he will get better* is not evaluated simply with respect to the common ground. A context is constructed for the evaluation of the apodosis prediction *Q* from the common ground context set (the modal base) of the protasis plus the protasis proposition. This means that the truth of *Q* is evaluated in those worlds in which *P* is also true.

This same type of evaluation takes place in a counterfactual conditional. Since protasis proposition *P* is counterfactual (true only in worlds outside the protasis ordering source context set), the worlds in which both *P* and *Q* are true cannot include worlds in the common ground evaluation context set. In other words, past morphology in the apodosis indicates that *Q* is true in a world far from the apodosis common ground ordering source; this large set of worlds is narrowed down by the requirements of the modal base context supplied by the protasis: the worlds in which *Q* is true must also be worlds in which *P John takes the medicine* is true.

Since English uses the modal auxiliary *will* for other purposes, namely to contribute an attitude evaluation of prediction (Nichols 2003a, Enç 1996) in the apodosis, 'past' morphology is used in the apodosis to indicate that apodosis proposition is evaluated in worlds outside the common ground. In Zuni, on the other hand, the irrealis suffix both contributes the apodosis prediction as well as indicates that the apodosis proposition *Q* is evaluated in worlds outside the common ground. Therefore Zuni does not require any other morphological indication of the relationship of *Q* to the reference context (such as modal use of 'past' morphology). Therefore, while English and Zuni counterfactuals ultimately look somewhat different in morphological form, the semantic composition and interpretation of the counterfactuals are the same. The differences arise from superficial properties specific to the lexical inventory.

4. Temporal Reference to Contexts

Counterfactual interpretation is constructed from two evaluation contexts plus morphology that indicates that the worlds in one of these contexts are located outside the other context serving as a basis of reference. In English and Zuni, the morphology used to indicate this relation between contexts is also used for 'past' temporal reference. In this section I will set out the argument that 'past' morphology in its temporal interpretation shares the same basic meaning as the modal cases: past tense specifies the type of relationship between a reference context and some other context of evaluation. Not only will we then be able to make sense of the form of Zuni past counterfactuals described above in [2] vs. the unmarked past counterfactual in [6], Zuni provides a different (and perhaps clearer) type of evidence for the role of contexts in temporal interpretation than that found in English – though reference to contexts is nonetheless a semantic component of tense meaning in both languages.

4.1 Assertion Contexts

Example [11] illustrates again the basic temporal use of the Zuni 'past' suffix *-kya*. Here the speaker is referring to an event part of a larger incident that occurred when the speaker was younger.

- [11] koyemshi yam nana homachi yate - kya
 mudheads refl.poss. grandchild H. catch -PAST
 'Koyemshi seized his grandchild Homachi.' (Bunzel 86.91)

Standard approaches to the semantics of tense treat tense as marking a temporal relation between the speech time and some event time/situation time (or interval), and sometimes additional temporal reference points are assumed; cf. Reichenbach (1947) and Comrie (1985) for discussion of this approach. Klein (1994) and Klein et al. (2000) argue, however, that tense does not mark a relation between the speech time/Time of Utterance (TU) and the situation time (TSit) but rather between the Time of Utterance and a time the speaker wants to make an assertion about, a Topic Time. Evidence for this characterization of tense comes, for example, from the use of past tense in examples like [12]. Past tense may be used here even though John is still sick at the time at which [12] is uttered. Past marking here is not referencing the time of the situation – John's having a cold – with respect to the utterance time but rather the time that the speaker wants to make an assertion about. Here this topic time, what I will instead refer to as assertion time, is the time interval that included the speaker's visit to John.

- [12] [Said upon return from a visit to John:]
 John had a cold.

This explanation appears to capture the semantics of English past tense more accurately than the standard approach, and, with minor adaptation, can be shown to reflect the same semantics of English 'past' in counterfactual contexts. The first adaptation is that 'past' morphology expresses the relation that one reference point is *outside* another reference point in the temporal domain as well as in the modal domain as discussed earlier. The second adaptation is that what tense is relating in the temporal domain is not reference times, such as a topic time, but rather reference contexts, of which a <time> specification is just one element, in addition to <speaker>, <hearer> (together these allow for a specification of locus), and <context set>. A similar claim that propositions are associated with multivariable contexts is made by Schlenker (1999). English 'past' tense marking then functions to indicate that the context about which an assertion is made (the Assertion Context) lies outside the Utterance Context.⁴

Note that we do not need to add that the Assertion Context lies outside *and prior* to the Utterance Context; the temporally past interpretation (rather than future) falls out by implication, since an assertion about a future context would always fall within the utterance context: all of the propositions at the current context are a subset of any future context set, but there are propositions in the current utterance context that were not

⁴ I gloss over here discussion of how the relation *outside* applies only to the temporal component in indicative assertions and not also world component; the issue is resolvable via something like vacuous application of the relation since the world component (=the common ground) is the same for each context.

necessarily part of the assertion context holding at a prior time (hence the only context set that the relation *outside* can pick out is a temporally prior context set).

4.2 Reference Contexts

One further development of this proposal is needed in order to explain how tense is marked in Zuni. I have said that past tense indicates the relationship between the Assertion Context and the Utterance Context, a proposal that remains fairly close to Klein's original idea that the Utterance Context (Time) is one of the points of reference. In fact, Zuni suggests that this reference context is not specifically the Utterance Context but more generally some Reference Context, for which the Utterance Context is merely the default case. I turn now to the Zuni evidence indicating both that tense interpretation makes reference to contexts as well as that tense makes reference to a more general notion of Reference Context rather than Utterance Context.

The sentences in example [13] below refer to separate events that make up part of a larger incident related by the narrator. The main verb in each of the propositions describing one of the (sub)events is marked with past suffix *-kya*.

- [13] a. ho' c'a - na - p 'atel 'imi - kya
1sg.nom. small - stat. - sub. earth cave.in - PAST
"When I was young, there was a landslide"
- b. hish 'a: - ho"i hish temlha 'i - k'ya'she - ti - kya
very pl. - person very all pl.sub. - busy.oneself - inch. - PAST
"All the people were excited."
- c. 'a: - k'o - ye - kkya
pl.sub. - cry - cont. - PAST
"They cried." (Bunzel 52.98)

Sometimes, however, the relation of past events in Zuni takes a form like the set of sentences in [14], that is, with no overt use of past tense morphology. (Note that the examples in [14] continue the narrative begun in [13].)

- [14] a. ham 'a: - shiwi mu:k"i - na - k"i 'a:w - a:n - e t - iha
some pl. - Zuni Hopi - stat.-to pl.subj. - go - pres. pl.subj. - DESID.PRES.
"Some of the Zunis were going to the Hopi country"

...Perhaps they still know how to tighten it up. Perhaps the earth is really opening up...

- b. 'a: - shiwi 'a:w - okyaccik'i ... yam cha-we' 'a:w - ito - k'ya - na:w - e
pl.- Zuni pl. - woman refl.poss child-pl. pl.obj.-eat-caus.-pl.subj.-PRES.
"The Zuni women [took out whatever they were saving and] gave it to their children to eat"
- c. 'a: - k'o - ye: - 'a
pl.sub. - cry - cont. - PRES.
"They were crying" (Bunzel 53.14-16)

In the case of [13], the reference context for temporal relations is the Utterance Context. Therefore tense marking indicates the relationship between the Utterance Context and the context with respect to which the assertion is made. Specifically, past tense marking indicates that the context about which the proposition is asserted lies outside the utterance context (again, as defined by variables <speaker, hearer, time, world>).

The set of examples in [14] indicate that the Reference Context need not be the Utterance Context. Here, the Reference Context appears to be shifted to some context that temporally precedes the Utterance Context. This prior context can also be defined in terms of sets of worlds: the set of propositions in a temporally prior context will be fewer than the set of propositions assumed at the utterance context and, therefore, in the case of the prior context, will be consistent with a larger set of worlds. The specific composition of the context set is not crucial, rather simply that the two contexts sets are in fact different. The speaker may choose either (or any other) context set as the Reference Context with respect to which tense marking applies.

When the Reference Context is this context/context set of worlds associated with temporally prior time, temporal relations of propositions are marked relative to this context. Events that are asserted to be concurrent with this [past] Reference Context are marked with present morphology, as in [14] – though they are nonetheless interpreted as past with respect to the current *Utterance Context*. What determines the interpretation of tense marking then is not simply the lexical semantic content of the morphology but rather the context that the morphology is marked with respect to. In other words, part of the meaning of tense marking is reference to some context, and manipulation of the Reference Context for temporal relations may change the interpretation of tense morphology. 'Past' morphology is not used in the Zuni examples in [14] since 'past' indicates that an assertion context is outside the Reference Context, while the propositions contained in [14] are in fact asserted as included within the (shifted) Reference Context.

A single basic meaning can therefore be identified for 'past' morphology in Zuni (and English) in temporal and modal contexts: the marking of some proposition as true in an Assertion Context that lies outside some specified Reference Context. Both in the non-modal and modal domains the particular character of the Reference Context (sub)set selected will determine the interpretation of the morphology.

One might wonder whether the examples in [14] illustrate a phenomenon sometimes referred to in English as the 'narrative present', where present tense morphology can take on past interpretation in special narrative contexts.⁵ Present tense is not the only morphology in Zuni with the ability to refer to a Reference Context other than the Utterance Context, suggesting that reference to contexts may be a general property of temporal reference in Zuni rather than specific to certain lexical items. Consider [15b,c] below, which illustrate the use of the irrealis suffix to mark the habitual for a series of past recollections.

⁵English narrative present usage may in fact be simply another example of a Reference Context set to a context other than the Utterance Context.

[15] "...Those who drank, when they came to their senses, they were poor....In order to drink a little they would waste all their property..."

a. k^wa' y - ay - yu'ya: - na - mm - e
neg. refl. - to - understand - stat. - neg. - PRES.
"They had no sense."

b. 'i - lhak - na:w - a
refl. - fight - pl.subj. - IRR.
"They fought together."

c. yam k^wa'holh lheyā k'uhmo - k'ya - na:w - a
refl.poss. what.indef. wear break - cause - pl.subj. - IRR.
"They tore their clothing."

(Bunzel 45.50)

Here habitual morphology is able to refer to a shifted Reference Context that is temporally prior to the Utterance Context, no overt past morphology is necessary.

I will have nothing further to say on the shifting of the Reference Context itself other than either (a) this may simply be stipulated as available to the grammar as a semantic mapping function, or (b) the Reference Context may be shifted due to the present of an implicit attitude operative (of narrative mode) with scope over a specified portion of the discourse (see Baker and Travis 1997 for some discussion of such a phenomenon with respect to Mohawk).

5. Zuni Counterfactuals Demystified

At first puzzling, the form of the Zuni past counterfactual below now follows straightforwardly from the shifting of the Reference Context from the Utterance Context to some other, temporally prior, context. Tense/mood morphology is interpreted in [16] with respect to this shifted reference context.

[16] hish 'akcek'i c'ana 'ash - e - p kok^w 'ash - e - nna
very boy small die - cont. - sub. katchina die - cont. - IRR.
"If the little boy had died, the katchinas would have died" (Bunzel 87.94)

Since this study is concerned with the form and interpretation of tense morphology in counterfactuals, a second aspect of the form of past counterfactuals in Zuni bears comment. Zuni past counterfactuals overtly marked as past differ from English past counterfactuals, briefly mentioned above, with respect to the single (Zuni) vs. double (English) marking of 'past' morphology in each clause of the counterfactual. The Zuni example in [17], bearing one past suffix in the protasis and one past suffix in the apodosis, can be contrasted in this respect with the English translation just below, which bears past + perfect morphology in each clause.

[17] wish - apc'i - nap - ka - tappa kok^w - 'an towo - 'a - ti - k'ya - nnaN - kya
neck - cut - pl.subj. - PAST - sub. katchina-to shoot-punct.-inch.-caus.-IRR. - PAST
"If they had cut his throat, he would have shot the Katchinas" (Bunzel 87.93)

The difference reduces to a fairly superficial morphological property of the grammars, from which the scope of the tense morphemes in each of the languages follows. The protasis in the Zuni example in [17] is a subordinate clause, and, like all subordinate clauses in Zuni, bears subordinating morphology suffixed to the verb, here *-tappa* (indicates a shift in event structure). Subordinating suffixes in Zuni turn verbs into a sort of temporally dependent participle, so that subordinated clauses are unable to bear their own tense morphology (unless of course tense features are contained in the subordinating suffix itself as in the case of the past *-kowa'* and non-past *-ona'* relative clause nominalizers). Instead, the tense suffix in a Zuni main clause has scope over its own clause as well as any associated subordinate clauses. Example [18] illustrates this in the case of non-modal indicative clauses.

[18] ho' c'a - na - p 'atel 'imi - kya
1sg.nom. small - stat. - sub. earth cave.in - PAST
"When I was young, there was a landslide" (Bunzel 52.98)

Zuni past counterfactuals such as [17] therefore bear only a single instance of 'past' marking used temporally because the *-kya* suffix in the apodosis (second) clause of the Zuni counterfactual has scope over both clauses (the *-kya* in the protasis (first) clause is interpreted modally). Similarly in unmarked past counterfactuals such as [16] above, where the Reference Context has been shifted away from the Utterance Context, only the main clause verb is marked irrealis; this irrealis suffix likewise has scope over both its own and the subordinate participial clause (and strictly with regard to form, is present counterfactual in both clauses).

In contrast, the counterfactual protasis in English is a full, independently inflected clause, its subordinate status indicated by the modal complementizer *if*. Both temporal and modal marking are required therefore in each clause of the English past counterfactual.

A final morphological question remains: why then is modal past *-kya* required in the first clause of the overtly past Zuni counterfactual in [17] if the main clause irrealis and tense morphemes have scope over both clauses? The answer for now must be empirical: *-kya* in the protasis of the past counterfactual in [17] is required for this subordinate clause to have modal interpretation. Without *-kya* the first clause would be interpreted as presupposed with respect to the common ground, and the sentence would have the interpretation "*They cut his throat, but he would have shot the Katchinas.*" Further explanation lies with a better understanding of the interaction of tense and modality affixes in the main clause in anchoring the various clauses of an utterance to the speech context.

6. Final Word

The discussion of the role of reference contexts in temporal interpretation in Zuni highlights the importance of providing precise semantic accounts of temporal and modal components of the grammars of particular languages. On the one hand, the discussion aims at opening up a broader research program toward a more detailed study of the formal semantic composition of tense and mood morphology, particularly with respect to the role of context in interpretation. In addition such treatments are important in the crosslinguistic study of conditional and counterfactual interpretation in order to determine which issues should be resolved on a language-specific basis and which properties reflect more general properties of conditional interpretation in natural language.

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