Characterizing and Progressive Readings of the Imperfective
Partitions as Quantificational Domains
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**Problem:** In languages with imperfective marking (e.g. Gujarati (1)), imperfective sentences exhibit at least two readings: the ongoing event or progressive reading and the characterizing reading, expressing generalizations over eventualities. Progressive marking (e.g. English), in contrast, typically allows only the former reading.

(1) niśā rasōḍā-mā roṭli baṇāv-e ch-e  
N.NOM kitchen-LOC bread.NOM make-IMPF.3.SG PRES-3.SG  
Niśā is making bread in the kitchen (right now).  
Progressive Niśā makes bread in the kitchen (at dawn).  
Characterizing

The meaning of imperfective marking is therefore more general than that of progressive marking. This cross-linguistic pattern of variation presents two challenges for a unified analysis of the imperfective and the progressive aspects: (a) finding a single meaning that can yield both progressive and characterizing readings; and (b) determining the source of the typological variation in the manifestation of imperfectivity – the semantically narrow progressive (as in English) and the more general imperfective (as in Gujarati).

Attempts have been made to account for the characterizing reading of the imperfective by assuming that it introduces a universal quantifier over (relevant) subintervals of the reference interval (Bonomi 1997), or characteristic sub-situations of a larger situation (Cipria & Roberts 2000). These analyses suffer from three shortcomings:

a. **Too strong:** Imperfective-marked sentences like (1) tolerate exceptions. The universal quantifier is too strong for this exception-tolerating property (one reason for positing GEN in the logical form of characterizing sentences).

b. **Extensional:** Imperfective-marked sentences describe non-accidental generalizations with *expected continuation in time*. A universal quantifier ranging over an extensional domain cannot account for this intensionality (also associated with GEN).

c. **Non-explicit restriction:** No explication of whether the set of ‘relevant’ intervals or ‘characteristic’ sub-situations is itself understood as the restriction (e.g. a predicate rel) or whether these terms refer to a pragmatic mechanism for determining the restriction predicate. In the absence of a theory for determining suitable restrictions, the restriction to “relevant” entities is unsatisfying and requires an adhoc weakening of the universal quantifier.

This paper proposes a unified analysis of the imperfective that overcomes these shortcomings and also accounts for the cross-linguistic variation. The analysis is couched in a semantics with branching times and preserves the association of universal force with the imperfective. The domain of the universal quantifier, on this theory, is a subset of a *regular partition* (i.e. a set of collectively exhaustive, non-overlapping, equimeasured subsets) of a history continuing the reference interval. The measure (length) for such a partition is a free variable whose value is assigned by context.

**Assumptions:** A pair \( \langle T, \prec \rangle \), where \( T \) is a nonempty domain of times with dense ordering and \( \prec \) is a transitive tree-like relation on \( T \) with the property of backwards linearity. A *history* (or maximal chain) \( h \) on \( T \) is a maximal totally ordered subset of \( T \). For any \( t \in T \), \( H_t \) is the set of histories containing \( t \). \( I \) is a non-null domain of intervals \( i \), where \( i \) is a proper subset of some history \( h \) in \( T \) and for all \( t_1, t_2, t_3 \in h \), if \( t_1, t_3 \in i \) and \( t_1 \prec t_2 \prec t_3 \) then \( t_2 \in i \). The function \( Inr \) assigns to each \( i \in I \) a proper subset of the histories containing \( i \) – the inertia futures of \( i \) (Dowty, 1979: 152). A regular partition of some history \( h, R_h \), is a set of intervals \( \{i, j, k...n\} \) such that
a. $\bigcup \{i, j, k\ldots n\} = h$

b. $\forall i, j \in \mathcal{R}_h \rightarrow i \cap j = \emptyset$ if $i \neq j$

c. $\forall i, j \in \mathcal{R}_h \rightarrow \mu(i) = \mu(j)$ (where $\mu(x)$ stands for the Lebesgue measure of $x$).

$\mathcal{E}$ is a domain of eventualities. A function $\tau$ from $\mathcal{E}$ to $\mathcal{I}$ gives the time span of an eventuality. Arguments to aspectual operators are predicates of eventualities – *sentence radicals* (saturated event descriptions) or of intervals – sentence radicals modified by Q-adverbs and quantified PPs.

**Proposal:** Imperfective marking realizes the aspectual operator IMPF, while progressive marking realizes the semantically narrower aspectual operator IMPF$_{prog}$. IMPF applies to a predicate $P$ over eventualities/interests to yield a set of intervals $i$ s.t. every inertial history continuing $i$ contains a $j$ where $i \subset_{nf} j$ and every subinterval $k$ of $j$ that is also a member of a contextually provided regular partition of $h$, $\mathcal{R}_h^c$, COINcides with $P$, where COIN is a relation defined as in (3). The context provides the measure (e.g. weeks, months, centuries...) for equimeasured subsets of $\mathcal{R}_h$.

\begin{align}
(2) \quad \text{IMPF} &= \lambda P \lambda i \forall h \in \text{Inr}(i) \rightarrow \exists j[i \subset_{nf} j \subseteq h \land \forall k \in \mathcal{R}_h^c[k \subset j \rightarrow \text{COIN}(P, k)]] \\
(3) \quad \text{COIN}(P, i) &= \begin{cases} \\
\{e \in P(e) \land \tau(e) \bigcirc i \} & \text{if } P \subseteq \mathcal{E} \\
\{P(i)\} & \text{if } P \subseteq \mathcal{I}
\end{cases}
\end{align}

The assumption that the domain of the universal quantifier is a subset of $\mathcal{R}_h^c$ as specified, allows us to overcome each of the shortcomings listed above. Imperfective sentences may be judged true despite exceptions because the domain of quantification guarantees a regular distribution of $P$ events in time, not an exclusive correlation between (possibly implicit) $Q$ events and $P$ events.

(1) is true even if Niša makes bread outside the kitchen, or if she makes pasta instead of bread, on some days, as long as there is a salient partition whose every member ($k \subset j$) overlaps with a bread-making event by Niša. Quantification over subintervals of alternative futures of the reference interval captures the intensional *expected continuation* element of the imperfective.

The progressive reading of IMPF arises when the measure for the partition is set to an *infinitesimally small* length. $\mathcal{R}_h^\inf$ (called an *I-partition*) is the set of subsets of $h$ of infinitesimally small measure. The progressive operator IMPF$_{prog}$ is just such a function. The setting of the partition to subsets of infinitesimal measure guarantees that $P$ COINcides with *every* subinterval of the reference interval $i$. This generates the ongoing event reading for accomplishment and activity predicates.

\begin{align}
(4) \quad \text{IMPF}_{prog} &= \lambda P \lambda i \forall h \in \text{Inr}(i) \rightarrow \exists j[i \subset_{nf} j \subseteq h \land \forall k \in \mathcal{R}_h^\inf[k \subset j \rightarrow \text{COIN}(P, k)]]
\end{align}

Imperfectivity is associated with two distinct operators – IMPF and IMPF$_{prog}$ – either (or both) of which may be realized morphologically cross-linguistically. IMPF allows for both characterizing and ongoing event readings; the measure for the partition (non-infinitesimal or infinitesimal) being contextually determined. The partition for IMPF$_{prog}$, in contrast, is obligatorily set to be an I-partition and can only be associated with the ongoing event reading. The paper will also show how the habitual, temporally contingent reading for IMPF$_{prog}$ arises in languages like English (c.f. John was eating only Ramen noodles until he developed Ulcerative Colitis.).

**Additional advantages:** This proposal also provides an elegant account of the interaction between Q-adverbs and IMPF (assuming the default scope to be IMPF $<$ Q-adverb), and presents an argument against the necessity of positing covert operators like GEN/HAB at least in some cases, assigning the semantic load they carry to the frequently morphologically overt IMPF.