Hab and Gen in the Expression of Habituality

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1. Introduction[1]

The term *habituality* is used in the linguistics literature for two different notions: an aspectual notion (Comrie 1976, Verkuyl 1995, Bonomi 1997, Xrakovskij 1997, Lenci & Bertinetto 2000, van Geenhoven 2004, Ferreira 2005), and a modal notion (Dahl 1985, Carlson 1977, Schubert & Pelletier 1987, Krifka *et al*. 1995, Landman 2008). Under the latter notion, habituality is sometimes viewed as a subtype of genericity, in the sense that it is gnomic and rule-like.

In this paper we propose an analysis of habituality with both aspectual and modal meaning components, but we reject the view that habituality is a subtype of genericity. We represent habituality by means of an operator Hab, an intensional summation of events, which is distinct from the generic operator Gen.

For the study of the different ingredients of habituality, English is a particularly well-suited language, as it is rich in habitual forms, especially in the past tense. In (1a), the simple past tense form of the verb appears, which can be interpreted habitually, in (b-d) – two periphrastic forms with two different auxiliaries: *used to* and *would*.

(1)   a. In the good old days, people **dressed** elegantly to go to the opera.

        b. In the good old days, people **used to dress** elegantly to go to the opera.

        c. In the good old days, people **would dress** elegantly to go to the opera.

But whereas habitual sentences in the simple past tense (2a) and those with the auxiliary *used to* (2b) do not require reference to the episodes which constitute the habit, habitual sentences with *would* require the episodes to be explicit, if not already presupposed in the context. This is illustrated by the contrast between (2c) and (2d):

(2)   (At the opera). Look at how sloppily people are dressed.

    a. In the good old days, people **dressed** elegantly.

    b. In the good old days, people **used to dress** elegantly.

    c. # In the good old days, people **would dress** elegantly.

    d. In the good old days, people **would dress** elegantly to go to the opera.

In this paper we discuss the contribution of the different components of English habituality expressions: how the verb is interpreted in its habitual reading, and how the two auxiliaries are interpreted. We argue that habituality is contributed by the verb itself, not the auxiliaries. The verb by itself is shifted to a habitual reading by a habitual operator we call Hab, which is a modalized existential quantifier over sums of events. In sentences which contribute an explicit restriction over events, a different operator, Gen, can be used instead. Gen is a modalized universal quantifier (Krifka et al. 1995). Both operators are expressed by the simple form of the verb. In the periphrastic forms of the verb, the auxiliaries do not mark habituality but rather introduce distinctions of mood and aspect. *Would* is traditionally taken to mark marks a mood distinction between factual and non-factual (e.g. in counterfactual conditionals). *Used to* is an aspectual marker, which is complex in that it marks a combination of two different aspectual dimensions: a viewpoint aspect distinction between imperfective and perfective, and a perspective distinction between internal and external (retrospective) perspective.

The paper is organized as follows. In section 2, we present our proposal, showing first why it is necessary to assume an existential habitual operator distinct from Gen, therefore

rejecting the view that Gen is the only operator underlying habituality (2.1); the semantic definitions of the various modal and aspectual operators we assume is detailed in section 2.2. In section 3 we provide evidence for our proposal, first centering on the temporal properties of the various habitual expressions, and then focusing on issues of quantification. Section 4 presents a new puzzle concerning the interaction of genericity with mood and aspect:

(3)   a. In the 19th century, French teachers / a French teacher would know Latin.

       b. In the 19th century, French teachers / *a French teacher used to know Latin.

Would, which is otherwise incompatible with individual-level predicates (*In the 50's, my French teacher would know Latin*), co-occurs both with a bare plural and an indefinite singular subject. *Used to,* which is equally compatible with stage-level and individual-level predicates (*In the 50's, my French teacher used to know Latin*) does not co-occur with an indefinite singular subject. We show how the solution to the puzzle relies on the role of the different meaning components in the expression of habituality clarified in our proposal. Section 5 is the conclusion.

2. The proposal

2.1   The grounds for distinguishing Gen from Hab

Not all habitual sentences involve universal quantification over events. This insight is found in Lenci (1995), who emphasizes a contrast between quantificational and non-quantificational habitual sentences, mentioned also in Krifka *et al.* (1995), (cf. Kleiber 1987, van Geenhoven 2001, Spector 2003, Rimell 2005):

(4)   a. Mary smokes a cigarette after dinner.

b. #Mary smokes a cigarette.

(4a) is felicitous since it is quantificational, i.e. its LF includes the quantifier Gen restricted to Mary-after-dinner events, and *a cigarette* can scope under Gen, allowing a different cigarette per Mary-after-dinner smoking event.

(5)   a. Gen e [after-dinner(e, Mary)] $\exists$x [cigarette(x) & smoke(e, Mary, x)]

(4b) is infelicitous since there is no explicit restrictor provided for the quantifier Gen.

(5)   b. Gen e [------ (e, Mary)] $\exists$x [cigarette(x) & smoke (e, Mary, x)]

(4b) is only interpreted with the existential quantifier taking scope over the habitual clause, which is infelicitous since it is impossible to smoke the same cigarette habitually;[2] *Mary smokes cigarettes* is in contrast felicitous since a kind (cigarettes) can be habitually smoked.

In the same way, a revision is required for many well-know examples which have been analyzed as involving universal quantification, since the existential quantifier does not scope under this purported universal quantifier. For instance, Carlson's example (6a), which is a generic sentence with an existential bare plural, has been analyzed with an existential quantifier in the matrix of a Gen operator. But this could not be correct, since the existential quantifier actually has wide scope over Gen, as seen in (6b):

(6)   a. Flowers grow out behind the old shed.   (Carlson 1989)

       b. A flower grows out behind the old shed.

(6b) is interpreted such that the same flower grows out behind the shed. This phenomenon is also attested in examples with iteration that is not generic:

(7)   a. Max killed rabbits repeatedly.   (Dowty 1979)

       b. #Max killed a rabbit repeatedly.

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[2] The felicity of the following example is due to the fact that *a pipe* is an instrument adverbial:
(i) a. Mary smokes a pipe
     b. Gen e [smoke(e, Mary)] $\exists$x [pipe(x) & instrument(e,x)]

The infelicity of (7b) arises from 'a rabbit' taking scope over the quantifier supplied by the adverbial, resulting in the same rabbit being repeatedly killed.

The contrast between examples (4b), (6b), (7b) and the example in (4a), repeated below, where the existential quantifier can scope below the universal quantifier, leads us to adopt the assumption that the restrictor for the universal quantifier over events, Gen in (5a), must be given explicitly:

(4)   a. Mary smokes a cigarette after dinner.

Sentences which do not have such a restrictor, e.g. (6b) and (7b), as well as (4b), repeated here, involve a different operator, which has been called Hab (Schoorlemmer 1995, Dobrovie-Sorin 2001, Scheiner 2002, Spector 2003, Van Geenhoven 2004, Rimell 2005), which is not universal, and thus does not create scopal distinctions with the existential quantifier.

(4)   b. # Mary smokes a cigarette.

The plurality of events in (4b) is thus the output of the operator Hab distinct from Gen, as shown in (8) below:[3]

(8) $\exists$x [cigarette(x) & Hab e smoke (e, Mary, x)]

As an operator distinct from Gen, Hab can also be found within the scope of Gen. In (9), Gen cannot give rise to habituality, since there is no restrictor on events in the sentence. Only the variable y is restricted (woman(y)), not an event variable. The operator Hab is the one which introduces habituality. Therefore (9b) is just as anomalous as (4b), though it is generic:

(9)   a. Women smoke.

          Gen y [woman(y)] [Hab e smoke(e, y)]

        b. #Women smoke a cigarette.

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[3] Doetjes (2007) presents an analogous contrast between degree modifiers and quantification adverbs with respect to the availability of a wide scope reading over an indefinite.

Gen y [woman(y)] $\exists$x [cigarette(x) & Hab e smoke(e, y, x)]

Gen may quantify over events when an explicit restrictor on events is found in the sentence:

(10)   Women smoke a cigarette after dinner.

Gen y, e [woman(y) & after-dinner(e, y)] $\exists$x [cigarette(x) & smoke(e, y, x)]

So far, a satisfactory definition for Hab has not been proposed. Van Geenhoven's (2004) definition is extensional, as is Scheiner's (2002), and relies on events with temporal gaps between them (in Boneh & Doron 2008 we show that temporal gaps are not necessary). Ferreira (2005) characterizes Hab as the plural counterpart of the progressive operator Prog, where Prog is defined on an atomic event, and Hab – on a sum of events. Like Ferreira, we propose that Hab is summational and modal, but we think that its modality is distinct from that of Prog, i.e. these are operators with different accessibility relations. The difference can be illustrated with the minimal pair in (11):

(11)   a. This student writes good papers.

b. This student is writing good papers.

The sentence in (11a) describes a disposition of the student, expressed by iterations of good-paper writing in all worlds close to the ideal world of the modal base. In (11b) on the other hand, the good-paper-writing may very well be accidental, with the progressive only requiring the continuation of a particular sequence of good-paper-writing in those accessible worlds were these particular good papers are written.

In our analysis of Hab in the next section, we explicitly define it as an operator which depends on summation of events in all the accessible worlds of the modal base $MB_{i,w}$ which is a set of gnomic alternatives to world w at time i, ordered with respect to an ideal world where dispositions hold indefinitely once initiated. Thus, Hab unlike Gen, is not a universal quantifier over events, but is dispositional.
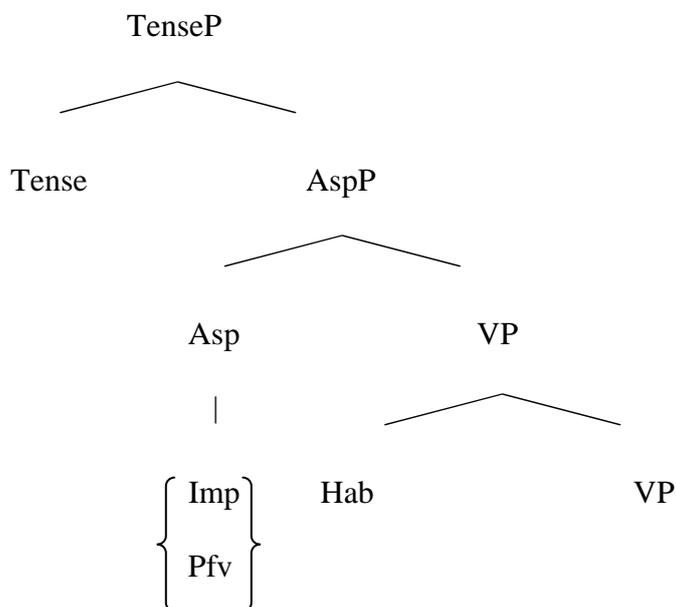
2.2   The various modal and aspectual operators

In the next subsections we provide the denotations of the operators involved in the
derivation of the habitual meaning by the three English habitual verb forms.

2.2.1 Denotation of Hab

We take Hab to be a modal VP adverb, selected by an AspP, and thus can be the input to
both imperfective and perfective aspect. Evidence for this aspectual variability is provided
in section 3.1. In our view, Hab is not the realization of imperfective aspect (Imp), as is
widely held (cf. Comrie 1976, Bonomi 1997, Cipria & Roberts 2000, Ferreira 2005, a.o).

(12)   TenseP

                    Tense   AspP

                              Asp   VP

                               |

                            ⎰ Imp ⎱   Hab   VP
                            ⎱ Pfv ⎰

Hab requires the existence of an iteration of events which 'continues' an actual event, for
each and every world w' of the appropriate sort.

(13)   Hab ~> $\lambda P \lambda s \lambda w$ [INIT (P,s,w) & $\forall w' \in MB_{\tau(s),w}$ $\exists e$ [$\tau(s) \subseteq \tau(e)$ & ITER (P,e,w')]]

Hab(P) is true of a state s in world w iff s is initiated in w, and for all worlds w' which are worlds close to the ideal world of the modal base $MB_{\tau(s),w}$ there is an event e, which temporally extends the state s, such that e is an iteration of P-events in w'. The modal base (Kratzer 1981, 1991) is a function from world-time pairs to a set of worlds, which are a set of gnomic alternatives to world w at time i, where dispositions are as in w at i. The alternatives are ordered by their closeness to the ideal world where dispositions hold constantly once initiated.

The definition of ITER is provided in (14) below. The notion at the basis of habituality is event iteration (e.g. Vlach 1993). We define iteration on the basis of Kratzer (2005), where P is a variable over properties of plural events (where plurality includes singularity) and σ is the sum operator of Link (1983).

(14)   ITER ~> $\lambda P \lambda e \lambda w[P(e, w)$ & $e = \sigma e'[P(e', w)$ & $e' \subset e]]$

e is an ITER(P)-event in w iff e is a sum of P-events in w, where the sum has proper P-subparts, i.e. it consists of at least two P-events.

The definition of INIT is found in (15) below. Hab does not require the actualization of the predicate P, but it does require some initiating event, an event which P-initiates the state s:

(15)   INIT ~> $\lambda P \lambda s \lambda w \exists e[\tau(e) < \tau(s)$ & e is an event indicating a disposition for P in w]

A state s is P-initiated in world w iff there is a prior event e indicating a disposition for P in w. We do not give an analysis of the notion of "indicating-a-disposition", but we have in mind events which satisfy either P itself (e.g. 16a-b below) or something like the signing of a contract in (16c) or the manufacturing of an inanimate object with particular telic *qualia* in (16d) etc.

(16)   a. John smokes.

        b. Bob jumps 8.90 meters.

c. Mary handles the mail from Antarctica.

d. This machine crushes oranges.

According to our definition of Hab, a habit can be predicated on the basis of event iteration in alternatives to the actual world, yet some initiating event is required in the actual world. In the case of many habituals, the initiating event will itself simply satisfy P. This fact is what allows (17) below to be felicitous:
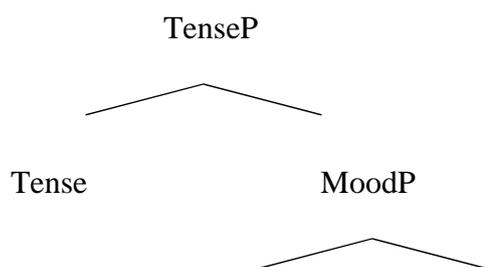
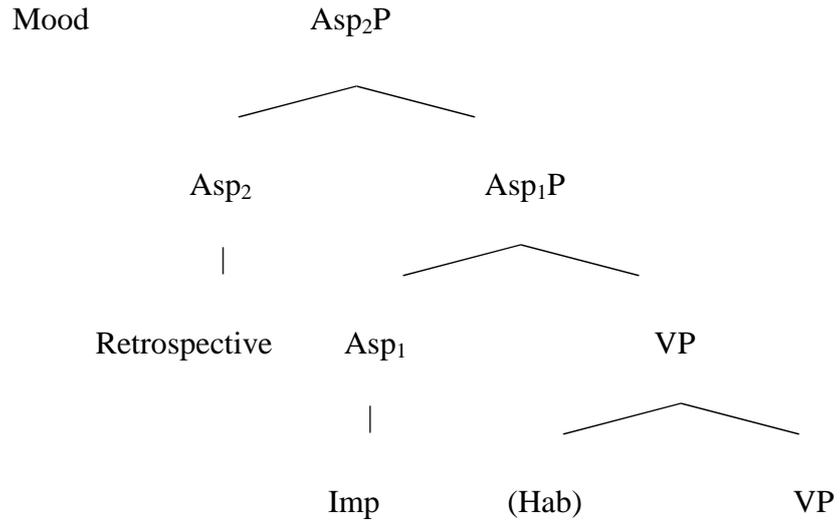(17) When did you start to smoke? (said while you smoke for the first time)

Though initiation can be a one-time event, iteration is central to Hab. It is found in all the accessible worlds, which are worlds where nothing inhibits the disposition from being manifested habitually. But in the actual world, nothing is required to occur beyond the initiating event, therefore there is no requirement for further actualization, only for disposition; in section 3.2 we show that this is different for habituals with *used to*.

2.2.2 Denotations of *used to* and habitual *would*

We view the auxiliary *used to* as a combination of two aspectual nodes: imperfectivity and retrospectivity. *used to* selects subintervals R (the reference time) of states s, including habits, and locates R as prior in time to a perspective time P (cf. the variables i and i^* below respectively):
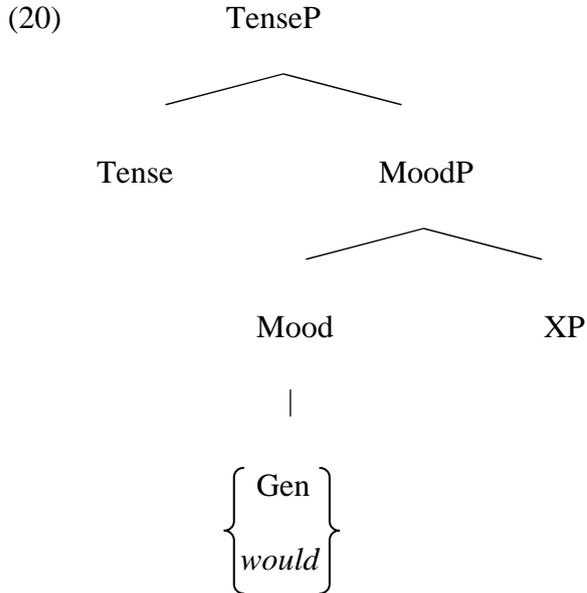
(18)   The Retrospective Habitual *used to* (=Asp_1 + Asp_2)

TenseP

Tense   MoodP

9

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        Mood                    Asp₂P
                            ╱          ╲
                      Asp₂              Asp₁P
                       |            ╱          ╲
                 Retrospective   Asp₁            VP
                                  |          ╱      ╲
                                 Imp      (Hab)      VP
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(19) a. Imp ~> λPλiλw∃s [P(s,w) & i ⊆ τ(s)]

     b. Retrospective ~> λPλi*λw∃i [P(i,w) & i < i*]

The denotation of Gen and of habitual *would* is as follows:

(20)   TenseP
          ╱   ╲
      Tense   MoodP
                   ╱   ╲
               Mood   XP
                |
            ⎧ Gen ⎫
            ⎨   ⎬
            ⎩*would*⎭

(21) Gen ~> λPλQλiλw∀z [[τ(z) ⊆ i & Q(z, w)] → ∀w'∈ MB$_{i,w}$ P(z, w')]

Gen(P)(Q) is true at time i in world w iff every z which is a Q-individual (object or event)

temporally included in i is a P-individual in all worlds w' close to the ideal world of the

modal base MB$_{i,w}$.

Would is a special case of Gen

(22)   a.   *would* ~> $\lambda P \lambda w \text{Gen}(P, P_C, i_C, w)$

where both the restriction and the temporal interval are provided by the context:

(22)   b. $\exists P_C \, \exists i_C \, [\exists s \, [i_C = \tau(s) \, \& \, \text{Hab}(P_C, s, w)] \, \lor \, \exists Q \, \text{Gen}(P_C, Q, i_C, w)]$

Thus, *would*(P) is true in a world w iff there is a contextually given P_C-habit such that every episode of this habit is in general also a P-event. This characterizes *would* in habitual contexts, it can be generalized to other modal contexts such as counterfactuality and modal subordination, but we will not do so here.

   According to the structures in (18) and (20), *would* is structurally higher than *used to.* Some basic motivation is provided by a couple of distributional facts. In (23), negation shows the relative order of the two auxiliaries: negation follows *would* and precedes *used to.*[4] The examples in (24) show that would and used to are not in complementary distribution (24b-c were found on the internet).

(23)   a.   In those days, Mary wouldn't smoke after dinner.

        b.   In those days, Mary didn't use to smoke.

(24)   a.   I wouldn't use to do my homework until six o'clock in the morning before school.

(Andrews 1978, ex. 24b)

        b.   My Dad, William Hugh Whitaker, began smoking cigars beginning in his late teens and truly had a love for a good cigar. When he died very suddenly in 1991, I had never had the opportunity to share a cigar with him. I do regret that we never sat down under the shade tree of our family home in Alabama, like he **would use to** do with his friends and family members, and enjoy a good cigar together.

(http://www.man-uppcigars.com/about)

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[4] Tough in formal registers of English one also finds negation infixed within *used to*, i.e. *used not to*.

c. My description of him in the last paragraph may have gotten you to think he was a very serious man who always told stories. But no, he is actually a very down-to-earth person. For instance, he **would use to** go jogging everyday and I would follow him walking all around youth park where monkeys would inhabit the trees in it and often we would stop look at them.

(http://fender-boy.blogspot.com/)

3. Substantiating the analysis

To substantiate our semantic analysis, we will first be concerned with the temporal differences between the three forms expressing habituality in English (section 3.1). In so doing we go against the received view that habituality is a subtype of imperfectivity. We show that although imperfectivity is most naturally associated with habituality, the two notions are not reducible to one another. The first step will be to show that the simple form expressing habituality may also be interpreted perfectively. Then, we show that *used to* instantiates a complex aspectual relation, assimilating it to a perfect form. Constructions with *would* will be shown to be the least marked in this respect, which is not surprising if the form is rather marked for mood. The second part of the section (3.2) centers on the distinctions between the two periphrastic forms, *used to* and *would*, adducing evidence for the purely aspectual nature of the first and the quantificational nature of the second.

3.1 Temporal aspects of habituality

3.1.1 Viewpoint aspect

Here we consider the viewpoint aspect interpretation of the forms expressing habituality in English. We first show that they can all be interpreted imperfectively, and we then show that the simple form can also be interpreted perfectively. The existence of perfective habituals is also argued for in Filip & Carlson (1997), and Boneh & Doron (2010).

A classical environment which can be used to demonstrate that all the habitual forms, including the periphrastic ones, can be interpreted imperfectively is modification by punctual *when*-clauses; the habit overlaps the time of the *when*-clause, rather than following it.

(25) a. When I met her, Yael slept during the day and worked at night.

  b. When I met her, Yael used to sleep during the day and work at night.

  c. When I met her, Yael would sleep during the day and work at night.

Another environment involves the reference time adverbial *in the 80's*. All three forms give rise to imperfective readings, i.e. all three forms can be interpreted so that the reference time, the 80's, is included in the habit, i.e. the habit could have started earlier and ended later:

(26) a. In the 80's, John went to work by bus.

  b. In the 80's, John used to / would go to work by bus.

But the habit expressed by the simple form (26a) also has a different interpretation, where the habit is included in the reference time, *in the 80's*. Under this interpretation, (26a) is true if the habit is only in part of the 80's, i.e. the simple past form can be interpreted perfectively. On the other hand, in (26b) with the periphrastic forms, the habit may only be understood as including the reference time, i.e. covering the whole of the 80's. (26b) is false if the habit of going to work by bus ended somewhere in the midst of the 80's.

Similarly, restriction by durational adverbials (e.g. *for*-adverbial) also results in perfectivity for the simple form, though not for the periphrastic forms:

(27) a. In the 80's, I worked in the garden for three years.

b. # In the 80's, I used to work in the garden for three years.

c. # In the 80's, he would work in the garden for three years.

Only the simple form (27a) is compatible with durational adverbs modifying the extent of the habit as a whole. The periphrastic forms are not; (27b-c) are only felicitous if the durational adverbial measures each episode underlying the habit, not the overall length of the habit.

We conclude that habituality is independent of imperfectivity, yet the periphrastic forms are only interpreted imperfectively. The next subsections are concerned with distinguishing temporal properties of the periphrastic forms.

3.1.2 Perspective time

The obligatory imperfectivity of the *used to* form seems at first sight to be contradicted by the retrospective view inherent to this auxiliary, with an effect of a habitual which is felt to be cut off from speech time (e.g. Tagliamonte & Lawrence 2000). The retrospective view is typical of *used to* periphrastic forms in general, whether they denote a habit, as in (28a), or other states, as in (28b) and (29):

(28) a. I used to dance, but I don't dance now.

b. It's just not like it used to be at all.   (Tagliamonte & Lawrence 2000, 9a-b)

(29) Her parents used to live in Paris.

We claim that retrospectivity, i.e. the disjointness of the periphrastic habitual from speech time (S) is actually not part of the semantics of this form, but arises as a conversational implicature. This is also the view of Comrie (1976) and Binnick (2005). Since it is an

implicature, retrospectivity can be cancelled, as illustrates the following attested example found on the internet:

(30)   … revivals of Broadway musicals that your parents **used to go** to. **Still do**.

Similarly there is a difference between the implicature in (31a) below from *used to* to *don't any longer* and the entailment in (31b) from *failed* to *did not pass*. (31a) could be true for a total of 10 classmates, whereas (31b) requires 15 classmates to be true:

(31)   a. Ten of my classmates used to live in Paris, and five still do.

      b. Ten of my classmates failed the exam, and five passed.

We suggest that what gives rise to the retrospectivity implicature is the competition between *used to* and a stronger form, the perfect, which entails that the state continues until S. An example is shown in (32a) vs. (32b):

(32)   a. For years he has been an idealist.

      b. For years he used to be an idealist.

We assume that the perfect and the periphrastic form with *used to* form an information scale (Horn 1989). The contrast between the two forms can be illustrated by (33), where the reference time R is explicitly claimed to stretch until S. In that case, only the perfect is allowed, since the reference time for *used to* does not extend until speech time:

(33)   Ruti sold her car in 1990.

      a. Since then, she has been going to work by bus.

      b. *Since then, she used to go to work by bus.

Both the periphrastic form with *used to* and the perfect are complex aspects, involving a relation between two temporal intervals and an event (cf. McCoard 1978, Kamp & Reyle 1993, Iatridou *et al.* 2001, Pancheva 2003, Pancheva & von Stechow 2004, Mittwoch 2008; see also Binnick 2005 on the parallelism between *used to* and the perfect). This

additional interval has been called P (Perspective time) by Kamp & Reyle (1993). The temporal relations between P and R are schematized in (34):

(34) a. Perfect

----------($_R$----------------------------($_P$---))-----

    b. Retrospective Habitual (*used to*)

----------($_R$------------)-----------------($_P$---)------

In the case of the perfect, P is the final subinterval of R, whereas with *used to*, R and P are disjoint. In the unmarked case, P is identified with the speech time S, as we have done in our discussion so far, but in other cases, P may be different from speech time.

We provide two diagnostics for the presence of a Perspective time, P, with *used to*. The first is incompatibility with the adverb *now* (Kamp & Reyle 1993). As shown by Kamp and Reyle, the simple past is compatible with the adverb *now*, since in the simple past, it is possible to associate P with the time of some past propositional attitude, overlapping R. An example is given in (35a). We show in (35b) that it is not possible to use *now* with *used to*, and we account for it by the requirement that R precede P:

(35) a. Mary was very happy. She now **went** to work by bus.

    b. Mary was very happy. *She now **used to go** to work by bus.

The second diagnostic concerns Sequence of Tense (SOT). Stative past tense clauses embedded under the past tense have a 'simultaneous reading' (cf. e.g. Abusch 1988, Ogihara 1989). If we view SOT as stemming from the fact that, as suggested in Abusch (1997), the past tense morphology of the embedded clause may express the pastness of the embedded R with respect to S, while it overlaps the time P of the propositional attitude, we predict that only the simple form, but not *used to*, gives rise to SOT. This prediction is borne out:

(36) a. John assured us that Mary **played** tennis twice a week.

b. John assured us that Mary **used to play** tennis twice a week.

In (36a), a simultaneous reading is available if the simple form is understood as habitual, i.e. as stative; whereas in (36b), only a past shifted reading is available with the form expressing habituality. The habit of playing tennis twice a week precedes the time of the embedding verb 'assure'. This property of *used to* is independent of habituality and manifests itself with states in general:

(37) a. Last year, rocker John Wesley Harding spent five days in San Francisco, where

        his parents **lived**.

           (http://articles.sfgate.com/2005-04-18/entertainment/17369224_1_john-wesley-harding-wesley-stace-duets)

     b. Last year, rocker John Wesley Harding spent five days in San Francisco, where

        his parents **used to live**.

In (37a), the embedded simple form may be interpreted with an internal perspective, whereby his five day visit in San Francisco takes place while his parents live there. The same does not hold in (37b), where only a retrospective reading is found: the period of his parents living in San Francisco precedes his five day visit.

    Turning now to the periphrastic habitual form with *would*, we see that the perspective time does not have to be cut off from the reference time. First, as illustrated in (38), *would* is compatible with the adverb *now*, indicating that the clause describes a state holding at P.

(38) Any plan for the future depended on the term of the girl's life now ending, and

      neither could speak of that. Sometimes, though, the boy **would now talk** of the past.

                                               (internet)

Second, the following example from Jespersen (1931), which is an attested example from 1906, shows that an embedded *would* allows for a simultaneous reading:

(39) We **used to meet** at the country house, where we **would spend** the weekend

      together.   (Jespersen 1931, 5.3(2))

In (39) the habit of spending the weekend together is simultaneous to the habit of meeting in the country house. Notice that if we reverse the habituality expressions, then the weekends spent together are interpreted as being in a period prior to the time of the meetings:

(40)   We **would meet** at the country house, where we **used to spend** the weekend
        together.

This is so since *used to* now only has scope over the embedded clause, and situates it as prior to P (and R) of the main clause. But *would* does not do the same in (39), it exclusively implies an internal perspective.

The temporal properties of the three forms expressing habituality are summed up in the following table:

(41)

	Viewpoint aspect	**Perspective**
simple form	imperfective/perfective	internal/retrospective
used to	imperfective	retrospective
would	imperfective	internal

The simple past tense form may be the input to both imperfective and perfective aspect, this is not different when Hab is present. Since Hab stativizes the VP, the imperfective is felt as more natural, but is not exclusively tied to this form. The periphrastic forms differ from the simple form in that the auxiliaries are attached above AspP, and thus impose selectional restrictions on it: Asp is imperfective for both periphrastic forms.

3.2   Actualization

The periphrastic form with *used to* patterns differently from the other verb forms with respect to instantiation of the habit in the actual world. The following example illustrates a habit which is only instantiated in actuality by a single episode. In this context, the simple form is true both under the episodic reading and the habitual reading, the form with *would* is true as well, but the periphrastic form with *used to* is not:

(42) **Context**: Ruti started a new job. She decided to go to work by bus. She only went there once, and shortly after that she died. In a eulogy, one could say:

a. Ruti was such a modest person. She **went** to work by bus.   TRUE

b. Ruti was such a modest person. She **would go** to work by bus.   TRUE

c. Ruti was such a modest person. She **used to go** to work by bus.   FALSE

We suggest that the requirement for the actualization of more than a single episode with *used to* does not signal lack of modality when it expresses a habit (cf. Bhatt 1999, Hacquard 2006 for actualization requirements for other modal operators). Rather, it stems from the aspectual properties of this form. The retrospective habitual, like the perfect, is characterized as involving an extended interval R, which is not an instant. Together with the imperfective interpretation of the retrospective habitual, the extended nature of R gives rise to the effect of the *used to* form as 'characterizing' a period of time, an effect which has been mentioned in literature (e.g. Comrie 1976). We assume that only properties which are actualized (at least at both ends of an interval) can serve to characterize a temporal interval, and not unactualized dispositions. We thus reduce the observation that *used to* forms only denote actualized habits to its aspectual characteristics.

3.3   Issues of quantification: *used to* vs. *would*

The two periphrastic forms differ in ways clearly indicating that *would* always requires the presence of a quantificational element in its clause, while *used to* does not.

First, *would* and *used to* contrast as to their properties in modal subordination. As is well known, *would*, even in non-habitual sentences, appears modally subordinated:

(43)   A thief might enter the house. He **would take** the computer first.

used to, on the other hand, serves to trigger modal subordination, e.g. *used to bake* in (44a), which forms a modal environment for the subordination of *would* in (44b-c):

(44)   a.   My grandmother **used to bake** the most wonderful pies.

b.   She **would go** to the orchard on Shady Lane early in the morning,

and **pick** a basket each of apples and peaches.

c.   Then she **would go** into the kitchen and **shoo** everyone else away.

d.   About 4 o'clock an irresistible aroma wafted through the entire house.

(based on Carlson & Spejewski 1997)

Thus, the temporal simultaneity of embedded clauses with *would*, discussed in section 3.1, is also found in modally subordinated main clauses. An additional illustration to this contrast is provided in (45):

(45)   a.   George **used to wait** for her outside school. They **would walk** up the mountain

road together.   (Internet)

b.   George **used to wait** for her outside school. They **used to walk** up the mountain

road together.

In (45a), the habit expressed by *would* can only be understood as intertwined in the habit expressed by *used to* in the first clause, whereas (45b) may be describing two separate habits.

Second, *would* contrasts with *used to* in scopally interacting with indefinites. In (46a) with *would*, the nurse may vary from episode to episode, however in (46b), with *used to*, the nurse is the same in the different episodes:

(46) a. I received eight more treatments, and the temporary amnesia became severe. I thought nothing bad about the treatments, however, for I was given a wonderful anaesthetic. When I awoke, a kind nurse **would be sitting** beside me with warm milk for my stomach if it hurt.   (Internet)

     b. I received eight more treatments, and the temporary amnesia became severe. I thought nothing bad about the treatments, however, for I was given a wonderful anaesthetic. When I awoke, a kind nurse **used to sit** beside me with warm milk for my stomach if it hurt.

The indefinite *a nurse* has narrow scope in (46a) and wide scope in (46b). This contrast is predicted by our analysis of the habitual *would* as including Gen. The indefinite *a nurse* is interpreted in the matrix of Gen, and has narrow scope relative to the episodes. On the other hand, according to our analysis, it is not Gen which derives the habituality of *used to* in (46b), but Hab, and thus the indefinite *a nurse* is interpreted with wide scope relative to the episodes.

To sum up, the habitual form with *would* is always constructed as modally subordinated, even in main clauses. It marks its clause as interpreted under a modal operator. *Would* itself is not a habitual marker but a subjunctive modal. In always occurring in the scope of quantifiers (including conditionals), it contrasts with the habitual interpretation of the periphrastic form with *used to*, which does not depend on a quantifier for its instantiation. *Used to* was shown to express a complex aspect, selecting states. As such, neither auxiliary is a form dedicated exclusively to the expression of habituality.

4. Resolving a puzzle: genericity meets mood and aspect

Our proposal explains a hitherto unnoticed contrast between *would* and *used to* involving bare plural and indefinite singular subjects.

(47)   a. In the 19th century, French teachers / a French teacher would know Latin.

     b. In the 19th century, French teachers / *a French teacher used to know Latin.

There are two ingredients to the puzzle: (i) what enables *would* which, unlike *used to*, is generally unacceptable with individual level-predicates to felicitously appear in (47a)? and (ii) what is the source of ungrammaticality of *used to* with an indefinite singular subject?

    Starting with (i), we first show that *would*, contrary to *used to*, is indeed not acceptable with individual-level predicates:

(48)   a. The London Bridge **used to** stand on the Thames, now it stands in Arizona.

     b. *The London Bridge **would** stand on the Thames, now it stands in Arizona.

Would is only compatible with stage-level predicates:

(49)   …The meetings **would** be loud and noisy…

This state of affairs is in accordance with our analysis. *Used to* is an aspectual operator selecting for states, including individual-level states. Habitual *would*, on the other hand, is interpreted as Gen, but an individual-level predicate is incompatible with an episodic restrictor, e.g. *#John is intelligent after dinner*. Yet (47a) shows that there are cases in which *would* is possible with an individual-level predicate such as *know Latin*. This type of example is possible since the restrictor of Gen is not a predicate of events but of objects. The restrictor can be provided by an indefinite singular or a bare plural. Moreover, bare plurals and indefinite singulars pattern alike in this context since the property of knowing Latin counts as inherent (rather than accidental), and can thus be predicated of a singular indefinite (Lawler 1973, Cohen 2001, Greenberg 2002).

Turning now to (ii), our analysis predicts that replacing *would* by *used to* would not keep the symmetry between the bare plural subject and the indefinite singular subject, since *used to* is aspectual and not quantificational. In (47b) the property *know Latin* is predicated of the kind $K_{French-teachers}$, which can be expressed by the bare plural but not by the singular indefinite. Unlike a bare plural, which can denote a kind (e.g. *Dodos are extinct*), a singular indefinite does not denote a kind (*A dodo is extinct*), rather it obtains a generic reading through the operator Gen binding its variable. In (47b), Gen takes scope over the whole clause, above the aspectual *used to*, yielding the wrong truth conditions (i.e. stating that typical teachers are such that in the 19th century they knew Latin). The interaction between the semantic components in (47b) is given in (50).

(50) a. *used to* (know-Latin ($K_{French-teachers}$))

b. Gen z [French-teacher (z)][*used to* (know-Latin (z))]

The difference between the auxiliaries *would* and *used to* in the way they interact with indefinite noun phrases in the clause thus receives a simple explanation if the former is a modal operator and the latter a marker of aspect.

5. Concluding remarks

Habituality is expressed in natural language by several combinations of modal and aspectual operators. We have argued that two different modal operators, Gen and Hab, are found in the expression of habituality, where Hab basically corresponds to Carlson's (1977) original definition of Gen as a monadic operator. We have shown how they interact with two different aspectual dimensions: a viewpoint aspect distinction between imperfective and perfective, and a perspective distinction between internal and retrospective perspective.

Specifically, we argued that the habitual form with *would* marks that its clause is interpreted under a Gen operator. Thus *would* itself is not a habitual marker but a subjunctive modal. In always introducing a conditional, it contrasts with the habitual interpretation of the simple past tense and of the periphrastic form with *used to. Used to* was shown to instantiate a complex aspect, selecting states. Thus, neither *would* nor *used to* are forms dedicated exclusively to the expression of habituality.

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Abstract (100-150)

The paper shows that habituality is expressed in natural language by various combinations of modal and aspectual operators. It is argued on the basis of English habitual forms (the simple form, periphrastic *used to* and *would*) that two different modal operators may be found in the expression of habituality: Gen, which is the operator in Krifka *et al.* (1995), and Hab, an operator which depends on summation of events in all the accessible worlds of a gnomic modal base. Hab, unlike Gen, which quantifies over events, is thus dispositional. It is further shown how Hab and Gen interact with mood and two different aspectual dimensions: a viewpoint aspect distinction between imperfective and perfective, and a perspective distinction between internal and external (retrospective) perspective, to derive the division of labor between the forms.

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