ON THE INTERACTION BETWEEN MODAL AND ASPECTUAL PERIPHRASES[*]

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ABSTRACT. This paper explores the semantics of combinations in which a modal verb is preceded by a progressive, an incremental or a habitual periphrasis. Two distinct readings in context, aspectualized VP and aspectualized modality readings are found to correlate with the (not-)at-issue status of the modal according to Tonhauser's diagnostics. Implicative readings (a generalization of the more restrictive notion of actuality entailments) emerge obligatorily in aspectualized VP readings, but are also present in some aspectualized modality readings. Aspectualized modality readings provide evidence for the claim that modalized event descriptions are stative.

Keywords. modals; aspectual periphrases; actuality entailment; (not-)at-issue- meaning

RESUMEN. Este trabajo investiga la semántica de las combinaciones en las cuales un verbo modal es precedido por las perífrasis progresiva, incremental o habitual. Se formula una correlación entre dos interpretaciones contextuales diferentes, la lectura de VP aspectualizado y la lectura de modalidad aspectualizada, por un lado, y el estatus del modal como contenido (no) en discusión según los tests de Tonhauser. Las lecturas implicativas (una generalización de la implicación realista) son obligatorias en las interpretaciones de VP aspectualizado, pero también están presentes en algunas lecturas de modalidad aspectualizada. Las lecturas de modalidad aspectualizada confirman indirectamente la idea de que las descripciones de evento modalizadas son estativas.

Palabras clave. modales; perífrasis aspectuales; implicación realista; contenido en discusión

1. Introduction

The field of modal-temporal interactions is one of the most actively researched in contemporary syntax and semantics (cf. Portner 2009, Chap. 5 and the literature cited therein, Falaus & Laca to appear, Rullman & Matthewson 2018), and it cannot be said to be stabilized. As for temporal categories with periphrastic expression, research has concentrated on the interaction between modals and compound ("perfect") tenses (Condoravdi 2002, Hacquard 2006, 2009, Demirdache & Uribe-Etxeberria 2008, Laca 2018 among many others), so that we still know relatively little about interactions with other temporal or aspectual periphrases. This is a promising field of inquiry, which is apt to shed light both on the semantics of different aspectual periphrases and on the issue of the different flavors of modality, particularly in the non-epistemic domain.

The goal of this paper is exploratory and descriptive: based on an extensive corpus investigation,[1] I will analyze some of the attested combination patterns and their

interpretations in Spanish, which are particularly challenging against the background of some recent proposal as to the syntactic-semantic architecture of sentences containing modal verbs, most notably Rullman & Matthewson (2018).

To my knowledge, the combinatorics of modals with aspectual periphrases has only been covered in some detail by Olbertz (1998) and Cinque (2001a). In both approaches, modal periphrases are interwoven into the architecture assumed for temporal and aspectual periphrases in a way that (a) refines the traditional distinction between epistemic and non-epistemic modalities and (b) follows the generally accepted view that epistemic modality scopes higher than non-epistemic modality, and, especially, higher than aspectual and/or temporal operators. Thus, for instance, the pattern Span. *tener*+*que*+VINF ('have+that+VINF) may be an expression of epistemic necessity (deduction), as in (1a), but it can only be an expression of deontic or teleological necessity when it is preceded by the aspectual/temporal periphrasis *ir* +*a* +VINF 'go +to+VINF) (1b):

(1)   a. Estos ejercicios **tienen   que ser**   muy fáciles para ti.
           these exercices have.PRS.3PL. that be.INF   very easy   for you
          'These exercises must be very easy for you'
        b. Estos ejercicios **van   a tener   que ser**   muy fáciles
           these exercices go.PRS.3PL. to have.INF   that be.INF very easy
           si queremos   que apruebe un 50% de los candidatos.
           if want.PRS.1PL   that approve a 50% of the candidates
          'These exercises will have to be very easy if we want 50% of the candidates to pass'

The most debated issue concerning this distribution of readings is whether epistemic modals occupy dedicated positions in the architecture of the clause -above Tense and Aspect (Hacquard 2006, 2009) or above Aspect (Homer 2010)- or whether there is a semantic-pragmatic rationale accounting for the impossibility of epistemic readings when modals scope below certain tenses and/or certain aspects.[2] This issue will be for the most part glossed over in this paper. Instead, we will concentrate on the semantic properties of combinations in which an aspectual periphrasis precedes a modal periphrasis (ASP>MOD>VP), such as those illustrated in (2a-d):

(2)   a. Ahora **estamos   pudiendo superar**   nuestras diferencias.
           now   LOC-be.PRS.1PL CAN.GER overcome.INF our   differences
          'We are now able to overcome our differences'
        b. Yo **solía   poder   estudiar** muchas horas de corrido.
            I use.IMPF.1SG CAN.INF study.INF many   hours at-a-stretch
          'I used to be able to study nonstop for hours'
        c. Poco a poco **fue   pudiendo   superar**   esas dificultades.
           little to little go.SP.3SG CAN.GER   overcome.INF these difficulties
          'Little by little s/he was able to overcome these difficulties'

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[2] For discussion of this issue, see, among many others, Condoravdi (2002), Papafragou (2005) , Rullman & Matthewson (2018,) Falaus & Laca (to appear).

In (2a) the modal is preceded by *estar* +VGER, the progressive periphrasis (**PROG**), in (2b) by *soler* +VINF, the habitual periphrasis (**HAB**), and in (2c) by *ir* +VGER, the incremental periphrasis (**INCR**). In such combinations, the modal verb receives overwhelmingly a non-epistemic reading,[3] but the intuition is that there are several distinct types of readings, some of them involving **aspectualized modality,** others involving simply **aspectual specification of the VP.** Thus, for instance, the progressive operator in (2a) apparently restricts the time of the possibility, producing the temporal contingency effect which characterizes combinations of the progressive with states and habituals (Deo 2015): this is a case of aspectualized modality. By contrast, the incremental operator in (2c) does not seem to act on the modality (which would give rise to a reading of gradual increase in the degree of possibility), but directly on the eventuality denoted by the VP, implying a successive and cumulative increase in the number of difficulties which have been overcome. In fact, no semantic differences are apparent between the linearisation (2c) and that in (3), corresponding to the ordering (MOD>ASP>VP):

(3)   Poco a poco **pudo**   **ir**   **superando**   esas dificultades.
            little to little CAN.SP.3SG go.INF overcome.GER these difficulties
            'Little by little s/he was able to overcome those difficulties'

Moreover, in [ASP>MOD>VP] combinations the modal verb often comes very close in meaning to an implicative verb (e.g. *to manage, to be forced to*), thus giving rise to what has come to be known in the literature as the **actuality entailment**. So, for instance, (4), whose second conjunct is a negation of the actuality entailment presumably carried by (2c), sounds contradictory:

(4) ?#Poco a poco **fue pudiendo superar** esas dificultades, pero no las fue superando/
      pero no las superó.
      'Little by little s/he was able to overcome these difficulties, but s/he did not
      overcome them"

In this paper, I will concentrate on determining whether the aspectual operator takes semantic scope over [MODAL+VP] or simply over [VP] and on the relation holding between this distinction and the implicative-like behavior of some combinations. Developing suggestions advanced by Mari (2015) and Rubio Vallejo (2017), I will claim that one of the main factors affecting the interpretation is whether the semantic contribution of the modal belongs to the at-issue-content of the utterance or expresses not-at-issue (projective) content. In aspectualized modality readings, the modal belongs to the at-issue-content, whereas in aspectualized VP readings, the modal expresses not-at-issue content. Aspectualized VP readings are invariably implicative, in a sense to be defined more precisely below. By contrast, aspectualized modality readings may or may not be implicative.

The paper is organized as follows: Section 2 is an introductory section, in which we review the main stances in the literature as to the problem of having aspectual operators scoping above modal operators and we characterize the semantic contribution of the aspectual periphrases involved. Section 3 is devoted to the distinction between at-issue and not-at-issue content and to actuality entailments,

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[3] Out of over 800 examined occurrences, only one or two could perhaps qualify as epistemic readings.
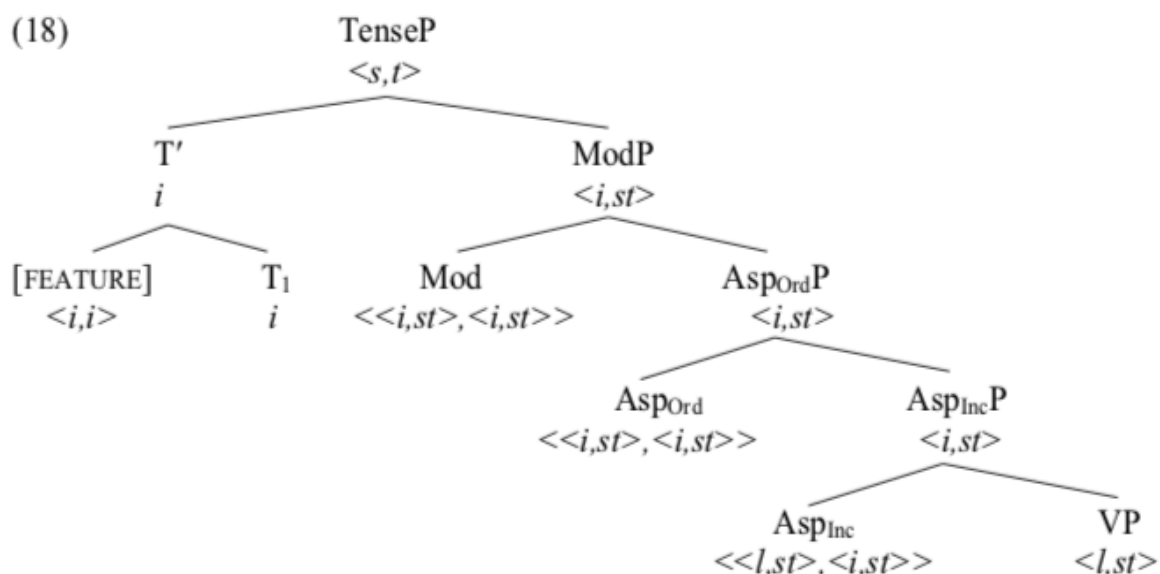
which, for reasons that will become evident in the discussion, I prefer to call implicative readings of modals. Section 4 is devoted to aspectualized modality readings. Section 5 concludes.

2. Modals and aspect in the architecture of the clause

2.1. Aspect below or above modals?

In a recent paper on modal-temporal interactions, Rullman & Matthewson (2018) propose a general and simple architecture for sentences containing modal verbs, which we reproduce below as (5). The structure is meant to capture what constitutes the null-hypothesis, it is claimed to apply equally to epistemic and non-epistemic modals, and provides a syntactic basis for the generalization that the temporal perspective of sentences containing modals is determined by Tense, whereas their temporal orientation is determined by Aspect together with the Aktionsart of the VP. Temporal orientation and temporal perspective are technical notions introduced by Condoravdi (2002), the former determining the time from which the modal background is accessed, the latter determining the temporal relation between this time and the time of the (type of) eventuality denoted by the VP.[4]

(5)

(18) TenseP $\langle s,t \rangle$

T′ i ModP $\langle i,st \rangle$

[FEATURE] $\langle i,i \rangle$ T$_1$ i Mod $\langle\langle i,st \rangle, \langle i,st \rangle\rangle$ Asp$_{Ord}$P $\langle i,st \rangle$

Asp$_{Ord}$ $\langle\langle i,st \rangle, \langle i,st \rangle\rangle$ Asp$_{Inc}$P $\langle i,st \rangle$

Asp$_{Inc}$ $\langle\langle l,st \rangle, \langle i,st \rangle\rangle$ VP $\langle l,st \rangle$

VPs have the type of predicates of events, i.e they are functions from events into (functions from worlds into) truth-values; a first layer of Aspect, inclusion Aspect, comprising imperfective and perfective aspects, is a function taking predicates of events as arguments and returning predicates of times; the second layer of Aspect, ordering Aspect, comprising perfect and prospective aspects, is a function from predicates of times into predicates of times. Modal verbs are also functions from
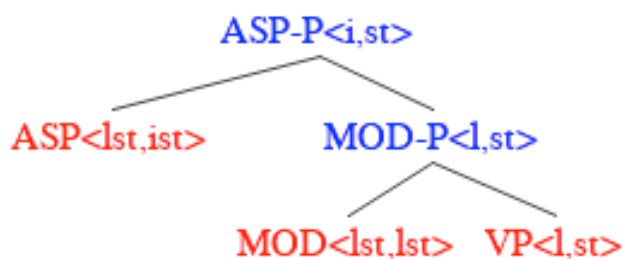
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[4] Demirdache & Uribe-Etxeberria (2008) propose this very same structure as the base structure from which other scope configurations may be derived, essentially by semantically motivated movement of the temporal arguments which, in their approach, occupy the specifier position of each projection.

predicates of times into predicates of times.[5] Having Aspect below the Modal projection is essential, among other things, for the account of the actuality entailment developed in Matthewson (2011). In this account, which develops an original suggestion by Angelika Kratzer, actuality entailments arise whenever the modal takes a perfective aspect projection as its complement; actuality entailments are, in fact, a consequence of the lack of an ordering aspect (prospective or perfect) below the modal.

However attractive in its elegance and simplicity, this proposal runs into serious problems when trying to account for the combinations which are the focus of this paper. First, the surface linearisations in (2a-c) above clearly suggest that in these cases, Aspect takes the modal projection as its complement, and not the other way around. Secondly, one of the periphrases involved, **PROG** (which, incidentally, is the most frequent one in such combinations), cannot but be an expression of Inclusion Aspect, and as such a function from eventuality descriptions into predicates of times (as we will see in the next subsection, the other periphrases present analogous problems). By contrast with what happens in the case of overt perfective aspect, which in Spanish is inflectionally expressed in combination with the past tense,[6] no plausible case can be built for scope inversion when periphrastic aspect is involved. Scope inversion not being an option, [PROG+[MODAL+VP]] is incompatible with the type-logical definition of modal verbs as functions from predicates of times into predicates of times. Progressive aspect takes an eventuality description as an argument, not a predicate of times (as we will see, this problem is compounded in the case of the incremental periphrasis by the semantic type of the output). Thus, modals below **PROG** would have to be modifiers of eventuality descriptions.

In fact, root modals had been previously analysed by Hacquard (2006, 2009) as functions from eventuality descriptions into eventuality descriptions, thus heading projections which can be the argument of (inclusion) Aspect, with an architecture as in (6):

(6)

Hacquard's influential account of the difference between root and epistemic modals builds precisely on the hypothesis that root modals differ in syntactic position and

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[5] Inclusion Aspect comprises in fact the two cases in which there is overlap between the interval and the temporal trace of the event. Ordering Aspect comprises those cases in which the two intervals are disjoint.

[6] Since the expression of perfective aspect is amalgamated with that of past tense, and past tense is amalgamated with Agreement, its morphological exponent can only appear on the modal verb. See Laca (2014) for this line of explanation in cases of "scope inversion" involving epistemic readings.

semantic type from epistemic modals, inasfar as they merge below Aspect and are modifiers of eventuality descriptions. A root possibility modal, for instance, is defined as follows:

(7)   a. $\lambda P_{<l,\ t>}$ $\lambda e.$ $\exists w'$ compatible with circumstances in w: P (w')

In words: a possibility modal as a modifier of event descriptions takes an event description P as an argument and returns a "modalized" event description, a property of events which in some world compatible with the circumstances in the world of evaluation are P-events.

When applied to a property of events such as *Mary-swim*, a root possibility modal returns the modalized event description in (7b):

(7)   b. $\lambda e.$ $\exists w'$ compatible with the circumstances in w: *Mary-swim* (e, w')

As for Aspect, over and above quantifying over the event variable, it introduces its own world variable, with a restriction requiring that the event "takes place" in that world. This free world variable will be identified with the world of evaluation in the absence of higher modal operators. Perfective aspect is thus defined as follows:

(8) $[|\text{PERFECTIVE}|]^{\ w,B\ \leq,\ c}\ = \lambda P_{<\varepsilon l,t>}.\ \lambda t_{<i>}\ \exists e\ [\underline{\text{e in w}}\ \&\ \tau\ (e) \subseteq t\ \&\ P\ (e)]$

In words: perfective aspect takes an event description P as its argument and returns a property of times such that the temporal trace of a P-event in a given world is included in that time.

By applying the perfective operator to the modalized event description in (6), we obtain:

(9) $\lambda t_{<i>}.\exists e\ [\underline{\text{e in w}}\ \&\ \tau\ (e) \subseteq t\ \&\ \exists w'$ compatible with circumstances in w:
        Mary swim (e,w')]

In order to ensure that the event in the world of evaluation whose temporal trace is included in the reference time is a swimming by Mary (i.e. has the same description as the "possible" event), Hacquard introduces the **Principle of Preservation of Event Descriptions Accross Worlds**, a pragmatic default which stipulates that if *e* is a P-event in a world w', it is also a P-event in all other accessible worlds.

Hacquard's proposal is meant to provide a formal account for the generalization that modals bearing perfective aspect give rise to the actuality entailment, i.e. they invite the inference that there is a P-event in the actual world (Bhatt 1999). As shown by the anomaly of the continuations in (10a-b), this seems to be an entailment of sentences with possibility modals in the perfective past in French, which however disappears with imperfective aspect (11a-b):

(10)   a. Hier,   Marie a   pu   nager   dans la piscine ,
             Yesterday, Marie have.PRS3SG CAN.PP swim.INF in   the pool,
            #mais elle ne   l'a   pas fait.
             but   she not it+have3SPRS NEG do.PP
            'Yesterday, Maria was able to swim in the pool, but she didn't'.
             b. Hier,   Marie a   pu   nager   dans la piscine
             Yesterday, Marie have.PRS3SG CAN.PP swim.INF in the pool

#et elle l'a   fait.
 and she it+have.PRS3SG do.PP
'Yesterday, Maria was able to swim in the pool, and she did'.

(11) a.Hier,   Marie pouvait   nager   dans la piscine,
Yesterday, Marie CAN.IMPF.3SG swim.INF in the pool,
mais elle ne l'a   pas fait.
but   she not it+have.PRS3SG   NEG do.PP

b. Hier,   Marie pouvait   nager   dans la piscine
 Yesterday, Marie CAN.IMPF.3SG swim.INF in the pool
 et   elle l'a   fait.
 and she it+have.PRS3SG   do.PP

This proposal has raised several criticisms, on which we cannot dwell here (see Portner 2009, Mari & Martin 2008, Homer 2009). The major problem with it is, in our view, that the empirical generalization it is designed to account for is not accurate, that is to say, perfective aspect does not always give rise to the actuality entailment, and imperfective aspect is apt to give rise to inference patterns closely matching the actuality entailment, as will be shown in Section 4.

To sum up, the combinations examined in this paper, in which a modal periphrasis is preceded by an aspectual periphrasis, suggest that some modals scope below Aspect, and that a treatment along the lines of Hacquard (2006, 2009) could be empirically preferable to the uniform treatment proposed by Rullman & Matthewson (2018). However, Hacquard's analysis comes at a rather high theoretical cost: modals should be given two different syntactic positions in the architecture of the clause, and two different logical types. Moreover, we lose the possibility of accounting for the correlation between the emergence of actuality entailments and the absence of (overt or covert) prospective aspect on the VP - for which a convincing case based on cross-linguistic evidence is made in Rullmann & Matthewson (2018) and Matthewson (2011). Instead, we seem bound to adopt the notion of modalized event descriptions and a much criticized pragmatic principle, Preservation of Event Descriptions, in order to ensure that the event variable existentially bound by the aspectual operator verifies the same predicate as the one in the modalized event description. This high theoretical cost   indicates that a clear understanding of the semantics of [ASP>MOD>VP] sequences is crucial.

2.2. The semantics of aspectual periphrases

For this investigation, we have selected the incremental periphrasis **INCR** (*ir* +VGER), the progressive periphrasis **PROG** (*estar* +VGER), and the habitual periphrasis **HAB** (*soler* +VINF). There are some indications that they belong to different layers of aspect (Laca 2004a, 2004b). Thus, for instance, **INCR** may be preceded by phasal periphrases (12a), it exhibits selectional restrictions as to the type of eventuality it may combine with (12b), and it is compatible with any tense, most notably with an aspectually specified tense such as the perfective past (12c).

(12) a. El avión **empezaba   a ir   perdiendo** altura.
      the plane begin.IMPF.3SG to go.INF lose.GER   height
      'The plane began to gradually lose height'

b. *__Iba__ __siendo__ víctima de una alucinación.
　go.IMPF.3SG　be.GER　victim of a hallucination
*'S/he went being the victim of an hallucination'
c. __Iban/__ __Fueron__ demoliendo la casa.
　go.IMPF.3SG/go.SP.3SG　demolish.GER the house
'They were gradually tearing down the house'

By contrast, **PROG** cannot be preceded by other eventuality modification periphrases, it does not exhibit selectional restrictions, and its semantic profile changes when combined with the perfective past.

(13)　a. *El avión **empezaba** **a estar** **perdiendo** altura.
　　　the plane begin.IMPF.3SG to LOC-be.INF lose.GER　height
　　　*'The plane began to be losing height'
　　b. **Estaba** **siendo** víctima de una alucinación.
　　　LOC-be.IMPF.3SG　be.GER victim of a hallucination
　　'S/he was being the victim of an hallucination'
　　c. ??El nivel del　mar **estaba/** **?*estuvo** **aumentando**.
　　　the level of+the sea LOC-be.IMPF.3SG/LOC-be.SP.3SG increase.GER
　　　'Sea level was rising'

HAB cannot be preceded by any other periphrasis and exhibits clear tense restrictions (it is only possible in the present and in the imperfective past):

(14)　a. *Va　a soler.INF /*Ha　solido escribir cartas.
　　　　go.PRES.3SG to use.INF / have.PRES.3SG use.PP write. INF letters
　　b. *Solió　escribir cartas.
　　　use.SP.3SG write. INF letters

Both **INCR** and **HAB** are pluractional operators, in the sense that they require event pluralities distributed in time (Laca 2004b). This common element in their semantics can be partially captured by the ITER operator defined by Boneh & Doron (2008):

(15) ITER ≈> $\lambda P_{<l,st>}$ λe λw [P(e,w) ∧ e=σe': [P (e',w) ∧ e'⊂ e]]
　　　(where σ is the sum operator)
In words: the ITER operator takes an eventuality description P as an argument and returns an eventuality description which is true of (strict) pluralities of P-events

We also follow Boneh & Doron (2008) in assuming that **HAB** is modal in nature, and that it applies to a predicate of events and yields a predicate of states/times (a disposition). **INCR** differs from **HAB** in three important respects: it is not modal in nature, it does not yield a predicate of states/times, but of events (a degree achievement), and it does not require that the events in the event plurality be (complete) P-events. Thus, (16) requires that P (Juan's dying) holds of the "big" degree achievement, but because of its quantized and once-only nature, it cannot possibly hold of the events in the plurality constituting this degree achievement.

(16) Juan se **fue** **muriendo** de a poco.
　　Juan REFL go.SP.3SG die.GER　of a little

'Juan died slowly'

As for **PROG,** it applies to predicates of eventualities and yields a property of times which are properly included in the temporal trace of the eventuality and do not contain neither the initial nor the final subinterval of the temporal trace. As standardly assumed, **PROG** is modal in nature, since it does not entail the existence of a P-event in the world of evaluation, but only in those world histories which are inertial or stereotypical continuations of the world of evaluation at the time of evaluation.

To sum up, we will study the semantics of [ASP-MOD] combinations for three distinct realizations of ASP. One of them, **INCR,** is not modal in nature and outputs eventuality descriptions with a specific temporal structure (degree achievements). The two others, **PROG** and **HAB** have a modal component, requiring quantification over inertial or stereotypical continuations of the world of evaluation, and output predicates of times.

3. *Aspectualized modality*- versus *aspectualized VP*- readings and (not)-at-issue content.

3.1. Semantically 'transparent' modals?

As advanced in the introduction, in some of the readings of [ASP-MOD] combinations the aspectual operator seems to affect the VP and not the [MOD-VP] combination. It is as if the modal were in some sense transparent to the semantic contribution of the aspectual operator.[7] This intuition can be confirmed by the following observation: **INCR** has strong selectional restrictions as regards the temporal structures it can combine with, excluding states and instantaneous events which cannot be coerced into durative readings. As shown by the sets of examples (17a-b) and (18a-b), on the one hand, and (19a-b) and (20a-b), on the other, the factors that exclude or allow the combination [INCR-MOD-VP] are the same which exclude or allow the combination [INCR-VP]:

(17) a. *****Iba**   **pudiendo vivir** en un ambiente   contaminado
          go.IMPF.3SG CAN.GER   live.INF in an environment contaminated
     b. *****Iba**   **viviendo** en un ambiente contaminado
          go.IMPF.3SG live.GER in an environment contaminated
(18) a. **Iba**   **pudiendo vivir**   en un ambiente   cada vez
       go.IMPF.3SG CAN.GER   live.INF in an environment each time
    más   contaminado.
    more contaminated
    'S/he was able to survive in an ever more contaminated environment'
     b. **Iba**   **viviendo** en un ambiente   cada vez más contaminado.
       go.IMPF.3SG live.GER   in an environment each time more contaminated
    'S/he was living in an ever more contaminated environment'
(19) a. *El muchacho **fue**   **teniendo que emigrar**.
      the boy   go.SP.3SG have.GER that emigrate.INF

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[7] Bravo, García & Krivochen (2015) invoke transparency as a property of functional auxiliaries, which distinguishes them from lexical auxiliaries. In using "transparency" as a merely descriptive term, intended to capture the fact that the selectional restrictions of the aspectual periphrasis are fulfilled by the VP, and not by the [MOD-VP] combination, I'm not taking any principled stance as to the distinction between lexical and functional auxiliaries.

    b. *El muchacho **fue**   **emigrando**.
      the boy   go.SP.3SG emigrate.GER
(20) a. La gente   **fue**   **teniendo que emigrar**.
       the people go.SP.3SG have.GER that emigrate.INF
      'Gradually, people had to emigrate'
    b. La gente   **fue**   **emigrando**.
      the people go.SP.3SG emigrate.GER
      'Gradually, people emigrated'

The stative character of the VP 'live in a contaminated environment' accounts for the unacceptability of both (17a) and (17b). Providing a scalar degree structure by means of the modifier 'ever more contaminated', as in (18a-b), ensures the compatibility of **INCR** both with the VP and with the [MOD-VP] combination. Furthermore, the instantaneous change of state denoted by the VP 'the boy emigrates' accounts for the unacceptability of both (19a) and (19b). Supplying an argument denoting a plurality, 'people', which allows for the creation of an incremental chain of participants in the event, ensures the compatibility of **INCR** both with the VP and with the [MOD-VP] combination. That is to say, the modal is transparent with regard to the selectional restrictions of **INCR.**

The question arises as to how it is possible that the semantic contribution of an expression remains transparent to the influence of an operator it combines with. The answer I'd like to explore is that this happens when the "transparent" semantic contribution constitutes a not-at-issue content.

3.2. At-issue and not-at issue-content and how to distinguish them

In most natural language utterances, the Speaker commits herself to a set of propositions, not all of which are the main point of the utterance. The main point of an utterance, its *at-issue*-content, is the propositional content via which the Speaker intends to address the Question-Under-Discussion in such a way in that the Addressee can be reasonably expected to recognize this intention. Most notably, the *at-issue*-content is the content which can be the object of direct assent or dissent. By contrast, *not-at-issue*-content comprises "secondary" or "backgrounded" propositions, which do not constitute the main point of the utterance. *Not-at-issue*-content is typically projective, in the sense that it survives embedding under operators such as negation and non-assertive sentence modalities. It comprises phenomena such as presupposition, conventional implicature and parentheticals (Potts 2005, Simons & al. 2010, see also Karttunen (2016) for a critical view).

Tonhauser (2012) proposes a series of 6 tests designed to distinguish at-issue- from not-at-issue-content on the basis of the acceptability or unacceptability of certain utterance - response patterns. From this series, I have adapted 3 tests in order to ascertain whether in (what was intuitively identified as) aspectualized VP-readings the prejacent is the at issue-content of the utterance in context. The first two tests, **assent with positive continuation** and **answer to a polar question**, were devised to ascertain whether the truth value of the prejacent (*p*) justifies assent or dissent with the modalized sentence (*Mod (p)*). The third, **answer to the Question-Under-Discussion**, is meant to test whether *Mod (p)*) is an acceptable answer to a Wh-question regarding *p*, thus showing that the at-issue content of *Mod (p)* is *p.*

In the following, I present first a set of examples in which the results of the tests indicate that *p* constitutes the at-issue-content of *Mod (p)* - these are the readings we have intuitively identified as aspectualized VP-readings, in which the modal seems

transparent to the influence of the aspectual operator. They are contrasted with a second parallel set of examples, which fail to show that *p* constitutes the at-issue-content of *Mod (p).*

Test 1: *Assent with positive continuation*
(21)   A. Hoy   Luis asiste   a la   escuela y con mucho esfuerzo y dedicación
          Today Luis attends to the school and with much effort   and dedication
          está   **pudiendo**   **obtener**   grandes logros.
          LOC-be.PRES.3SG CAN.GER   obtain.INF great achievements
          B. Es   cierto, **está**   **obteniendo** grandes logros.
            be.PRES.3SG   right, LOC-be.PRES.3SG obtain.GER great achievements
          'A. Nowadays, Luis is going to school and with a lot of effort and dedication
          he's been able to achieve great results.
          B. Right, he is achieving great results'

    The acceptability of B's response shows that *p* justifies assent to *Mod (p).* It may be inferred that the modal does not belong to the at-issue-content of *Mod (p).*

Test 2: *Answer to a polar question*
(22)   A. ¿El neoliberalismo **está**   **pudiendo**   **hacer** sus estragos
            the neoliberalism   LOC-be.PRES.3SG CAN.GER   make its havoc
          sin encontrar resistencia?
          without finding resistance?
          B. Sí, **está**   **haciendo**   sus estragos sin encontrar resistencia/
            yes LOC-be.PRES.3SG make.GER   its havoc   without finding resistance
          No, no **está**   **haciendo**   sus estragos sin encontrar resistencia
           no not LOC-be.PRES.3SG make.GER   its havoc without finding resisteance
          'A. Is neoliberalism able at the moment   to wreak havoc without meeting
          resistance?
          B. Yes, it is wreaking havoc without meeting resistance/No, it is not wreaking
          havoc without meeting resistance'

    The acceptability of B's response shows that the truth-value of *p* justifies the assertion of *Mod (p)* or of its negation. It may be inferred that the modal does not belong to the at-issue-content of *Mod (p).*

Test 3: Answer to the Question Under Discussion
(23)   A. ¿Quién **está**   **construyendo** todo?
             who   LOC-be.PRES.3SG build.GER   everything
          B. Los chinos **están**   **teniendo que construir** todo.
            the Chinese LOC-be.PRES.3SG have.GER that build. INF everything
          'A. Who is building everything?
           B. At the moment, the Chinese have to build everything'
(24)   A. ¿Cuántos   proyectos sociales se **están**   **llevando** a cabo?
             how-many projects social   REFL LOC-be.PRES.3SG carry.GER to end
          B. En este momento, **estamos**   **pudiendo realizar** 40 proyectos sociales.
            in this moment   LOC-be.PRES.1PL CAN.GER realize 40 projects social
          'A. How many social programs are being carried out?
           At the moment we are able to carry out 40 social programs'

In both examples, the acceptability of B's response shows that *Mod(p)* is an adequate answer to a **QUD** concerning *p.* It may be inferred that the modal does not belong to the at-issue- content of *Mod(p).*

The tests give very different results with the following set of examples, in which we use the same aspectual operator in order to ensure comparability:

Test 1: *Assent with positive continuation*
(25)   A. Hoy día [...] casi toda la gente   **está**   **pudiendo optar** *a*
          today day   almost all the people LOC-be.PRES.3SG CAN.GER   opt to
       mejores trabajos
       better   jobs

       B. # Es   cierto, la gente   **está**   **optando** a mejores trabajos.
          be.PRES.3SG right, the people LOC-be.PRES.3SG opt.GER   to better jobs
       'A. Nowadays almost everybody is able to choose better jobs.
         B. Right, people are choosing better jobs'

The unacceptability of B's response shows that *p* does not justify assent to *Mod (p)*. It may be inferred that the modal belongs to the at-issue-content of *Mod (p).*

Test 2: *Answer to a polar question*
(26)   A. ¿Se **está**   **pudiendo hacer** la licitación?
          REFL LOC-be.PRES.3SG CAN.GER   make the call-for-bidding
       B. #Sí, se   **está**   **haciendo**   la licitación[8]/
          yes REFL LOC-be.PRES.3SG make.GER   the call-for-bidding
       #No, no se   **está**   **haciendo** la licitación.
       no not REFL LOC-be.PRES.3SG make.GER   the call-for-bidding
        'A. Is a call for bidding possible at the time?
         B. Yes, we are making a call for bidding/ No, we are not making a call for bidding'

The unacceptability of B's response shows that the truth-value of *p* does not justify the assertion of *Mod (p)* or of its negation. It may be inferred that the modal belongs to the at-issue-content of *Mod (p).*

Test 3: Answer to the Question Under Discussion
(27)   A. ¿Quiénes **están**   **subiendo**   fotos a sus cuentas ?
          who.pl LOC-be.PRES.3SG upload.GER photos to their accounts?
       B. #Los usuarios de Instance   **están**   **pudiendo subir** fotos
          the users   of Instance   LOC-be.PRES.3SG   CAN.GER   upload photos
          a sus cuentas.
          to their accounts
       'A. Who is uploading photos to their accounts?
         B. Instance users are able at the moment to upload photos to their accounts'
(28)   A. ¿Qué empleados   **están**   **probando** que son competentes?
          which employees LOC-be.PRES.3SG prove.GER that are competent

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[8] Some speakers find the response (26B) coherent in its affirmative version. This is to be expected: by virtue of the entailment p $\models \lozenge$ p, which is valid in most modal backgrounds (except for those involving permission), asserting *p* can count as justification for the truth of POS(*p*).

B. #Los empleados más jóvenes **están**   **teniendo que probar**
    the employees more young   LOC-be.PRES.3SG have.GER that prove.INF
    que son competentes.
     that are competent
'A. Which employees are proving themselves to be competent ?
  B. Younger employees are having to prove themselves competent'

In both examples, the unacceptability of B's response shows that *Mod(p)* is not an adequate answer to a **QUD** concerning *p.* It may be inferred that the modal belongs to the at-issue-content of *Mod (p).*

Thus, the proposed adaptation of Tonhauser's tests provides a rather objective correlate for the initial intuition as to the existence of two different readings for [ASP>MOD>VP] combinations, the **aspectualized VP readings**, now defined as readings in which the modal does not belong to the at-issue-content but contributes some sort of projective content, and the **aspectualized modality readings**, in which the modal belongs to the at-issue-content.

3.3. Aspectualized VP-readings, implicative readings and the actuality entailment.
Since aspectualized VP readings are those in which the main point of the utterance of *Mod(p)* is *p*, they are automatically **implicative readings**. This does not mean, however, that they carry an actuality entailment. In its usual sense in the literature, an actuality entailment is an entailment to the effect that a situation of the type described in the prejacent is instantiated in the world of evaluation. However, such an entailment may not be warranted by temporal-aspectual morphology, independently of the modal. To make this clear with an example: (28a) does not carry an actuality entailment, but then neither does the unmodalized sentence (28b) -by virtue of the "imperfective paradox".

(28)   a. Por fin, Juan **está**   **pudiendo pagar** todas sus deudas.
     by last Juan LOC-be.PRES.3SG CAN.GER pay.INF all his debts
    At last, Juan is able to pay all his debts'

⊭ There is at some time in w* an event (e) such that JUAN-PAY-ALL HIS DEBTS (e)

   b. Por fin, Juan **está**   **pagando** todas sus deudas.
    by last Juan LOC-be.PRES.3SG pay.GER   all his debts
   'At last, Juan is paying all his debts'

⊭ There is at some time in w* an event (e) such that JUAN-PAY-ALL HIS DEBTS (e)

This notwithstanding, (28a) apparently entails (28b), as can be shown by the fact that coordination with the negation of (28b) is felt to be contradictory and coordination with the assertion of (28b) is felt to be redundant:

(29)   Por fin, Juan **está**   **pudiendo pagar** todas sus deudas,
    by last Juan LOC-be.PRES.3SG CAN.GER pay all his debts
   a. # pero no las   **está**   **pagando**.
     but not them LOC-be.PRES.3SG pay.GER
   b. # y las   **está**   **pagando**.
     and them LOC-be.PRES.3SG pay.GER

What we are calling implicative readings are a generalization of the actuality entailment: in such readings, commitment to a sentence containing a modal goes hand in hand with commitment to the sentence obtained by suppressing the modal while keeping the aspectual and temporal specifications of the original sentence. Thus, (30a) carries an actuality entailment and exemplifies an implicative reading. (30b) neither carries an actuality entailment nor exemplifies an implicative reading. Finally, (30c) does not carry an actuality entailment, but it does exemplify an implicative reading:

(30)   a. Por fin, Juan pudo   pagar todas sus deudas.
          by last   Juan CAN.SP.3SG   pay.INF all his debts
          |= There is at some time in w* an event (e) such that JUAN-PAY-ALL HIS DEBTS (e)
          |= Juan pagó   todas sus deudas
             Juan pay.SP.3SG   all   his debts

          b. Por fin, Juan puede   pagar   todas sus deudas.
            by last Juan CAN.PRES.3SG pay.INF   all   his debts
          |≠ There is at some time in w*   an event (e) such that JUAN-PAY-ALL HIS DEBTS (e)
            |≠ Juan paga   todas sus deudas.
               Juan pay.PRES.3SG   all his debts

          c. Por fin, Juan está   pudiendo pagar   todas su deudas.
            by last Juan   LOC-be.PRES.3SG CAN.GER pay.INF all his debts
          |≠ There is at some time in w*   an event (e) such that JUAN-PAY-ALL HIS DEBTS (e)
          |= Juan está   pagando todas su deudas.
             Juan LOC-be.PRES.3SG pay.GER   all   his debts

Implicative readings can be identified by two main tests.[9] First, assertion of the modalized sentence is incompatible with the negation of the prejacent -in the understanding that the prejacent keeps the aspectual and temporal specifications of the modalized sentence:

(31)   Las empresas nacionales **están   pudiendo autofinanciarse,**
          the companys national   LOC-be.PRES.3PL CAN.GER   self finance
          #pero no se   **están   autofinanciando**.
             but not REFL LOC-be.PRES.3PL self finance.GER
          'National companies are able to self-finance at the moment, but they are not self-financing'

Secondly, the modal verb can be replaced by an implicative predicate without much change in meaning:

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[9] See Bértola (2019) for an application of these tests to combinations of modals with the synthetic and the periphrastic future in Spanish.

(32)   a. durante las tormentas y   lluvias torrenciales los sistemas
           during   the storms   and rains heavy   the systems
        suelen   tener   que procesar un mayor volumen de líquidos
        use.PRES.3PL have.INF that process.INF a greater volume of liquids
        'During storms and heavy rainfalls the systems usually have to process a
        greater liquid volume'
        b. ..suelen   **verse   obligados** a procesar...
           use.PRES 3PL see.REFL.INF obliged   to process.INF
           'are forced to process'

The second test capitalizes on the semantic closeness of certain readings of modals
with implicative verbs, which has been linked to the issue of actuality entailments at
least since Bhatt's (1999) original analysis. I agree with Hacquard (2014) that giving
an implicative semantics to modals in implicative readings (as Bhatt proposed for *be
able to)* is unsatisfactory, since it introduces unwarranted ambiguities which appear to
be systematic with root modals. However, a closer look at what we know about
implicative verbs can help us understand what is at stake in aspectualized VP
readings, which are invariably also implicative.

3.4. The semantic contribution of the modal in aspectualized VP-readings
    Modals giving rise to implicative readings behave as two-way implicative verbs
(Karttunen 1971, 2016), in as far as they support the following inferences:

(33)   a. Vimpl (p) $\rightarrow$ p
        b. ¬Vimpl (p) $\rightarrow$ ¬p

(34)   a. Juan logró comprarse una casa $\rightarrow$ Juan se compró una casa.
           Juan managed to buy a house   Juan bought a house
        b. Juan no logró comprarse una casa $\rightarrow$ Juan no se compró una casa.
           Juan didn't manage to buy a house   Juan didn't buy a house

(35)   a. Juan pudo/tuvo que comprarse una casa $\rightarrow$ Juan se compró una casa.
           Juan was able to/ had to buy a house   Juan bought a house
        b. Juan no pudo/tuvo que comprarse una casa[10] $\rightarrow$ Juan no se compró una
           casa.
           Juan was not able to/ did not have to buy a house Juan didn't buy a house

    In two-way implicative situations, there is thus truth-conditional equivalence
between the sentence with the implicative verb/with the modal and the proposition the
implicative verb/the modal applies to. The question thus arises as to the semantic
contribution of the implicative verb. According to Karttunen (2016), implicative verbs
contribute a projective content (a conventional implicature) which varies according to
the lexical expression and is not always easy to capture in words. An attempt to
capture the semantics of *lograr* 'manage' and *verse obligado a* 'be forced to', which

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[10] Metalinguistic negation, which is recognizable by intonational emphasis on the modal, may cancel
the implicative reading of the negated necessity modal. Notice that for Karttunen (2016), necessity and
their ilk are only one way implicative, the negation of the prejacent being only an invited inference (a
conversational implicature) in this case.

are often the closest paraphrases for the possibility and for the necessity modal, respectively, may look as follows:

(36)   Juan logró comprarse una casa.
         'Juan managed to buy a house'
         (a) *At-issue-content*: Juan bought a house.
         (b) *Projective content*: There is some impediment for Juan's buying the house, and Juan prefers buying a house to not buying it.

(37) Juan se vio obligado a comprar una casa.
         'Juan was forced to buy a house'
         (a) *At-issue-content*: Juan bought a house.
         (b) *Projective content*: Something causes Juan to buy a house, and Juan prefers not buying a house to buying it.

The at-issue content neatly matches the at-issue content we had identified for aspectualized VP readings, since it is the content of the prejacent. But what is the projective content in aspectualized VP-readings? Although the modality appears to be truth-conditionally trivialized in such cases, according to the very apt expression coined by Borgonovo & Cummins (2007), possibility and necessity modals make a distinct semantic contribution, something that can be shown by comparing the modalized sentence with the prejacent.

First and foremost, the modalized sentence conveys the preference of an Agent[11] for the prejacent, in the case of the possibility modal (38a), or for the negation of the prejacent, in the case of the necessity modal (38b). Such preferences are entirely absent in the non-modalized sentence (38c):

(38)   a. **Fuimos pudiendo   superar**   nuestras diferencias,
             go.SP.1PL CAN.GER   overcome.INF our   differences
           como queríamos/   #aunque no   queríamos.
           as   want.IMPF.1PL / although not want.IMPF.1PL
           'We were gradually able to overcome our differences, as we wished/#though we didn't wish to'

         b. **Fuimos   teniendo que superar**   nuestras diferencias,
             go.SP.1PL have.GER that overcome.INF our differences
         #como queríamos/   aunque no queríamos.
           as   want.IMPF.1PL / although not want.IMPF.1PL
           'We were gradually forced to overcome our differences, #as we wished/though we didn't wish to'

         c. **Fuimos   superando**   nuestras diferencias,
             go.SP.1PL overcome.GER our differences
           como queríamos/ aunque no   queríamos.
           as   want.IMPF.1PL / although not want.IMPF.1PL
           "We gradually overcame our differences, as we wished/though we didn't wish to'

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[11] The relevant Agent is often, but not necessarily the sentential subject .

Secondly, implicative readings with the possibility modal convey that there is some difficulty or unexpectedness in the carrying out of the action described in the prejacent (Karttunen 1971, Mari 2015). Thus, (39b), which contrasts with (39a), appears unfelicitous due to the implication that if somebody can solve a problem which is difficult to a degree *d*, she is expected to be able to solve problems which are difficult to a lesser degree. As shown by (39c), the unmodalized sentence is neutral with regard to this implication:

(39)   a. **Fue   pudiendo   resolver** problemas cada vez más difíciles.
          go.SP.3SG CAN.GER   solve.INF   problems each time more difficult
       'S/he was able to solve ever more difficult problems'
       b. #**Fue   pudiendo   resolver** problemas cada vez menos difíciles.
          go.SP.3SG CAN.GER   solve.INF   problems each time less difficult
       'S/he was able to solve ever less difficult problems'
       c. **Fue   resolviendo** problemas cada vez más/menos difíciles.
          go.SP.3SG solve.GER .INF problems each time more/less difficult
       'S/he was solving ever more/less difficult problems'

The projective content conveyed by the modal in the aspectualized VP readings is thus also close to that conveyed by implicative verbs -which is to be expected, in the light of the fact that they are most of the time substitutable for each other. But in the case of implicative verbs, this projective content is determined lexically. Purely lexical determination of the projective content cannot be assumed in the case of modals without introducing an ambiguity in their treatment.

Hacquard (2006, 2014), Mari (2015) and Rubio Vallejo (2017) provide some cues as to how the projective content may be derived. For all three of them, the contrast between the modalized sentence and the unmodalized sentence in the case of the possibility modal contributes to foreground the implication that things might have been otherwise (that ¬p was a live possibility), which relates to the difficulty or unexpectedness component. Both Mari (2015) and Rubio Vallejo (2017) assume, furthermore, that the flavor of modality involved is quite specific: the conversational background includes a bouletic/teleological ordering source containing propositions about the relevant agent's goals and intentions. This assumption relates to the preference component. However, much work is still needed in order to develop a precise account of the projective content and how it arises.

4. Aspectualized modality readings

4.1. When the modal is at-issue

As mentioned in section 3.2. above, some [ASP>MOD] combinations fail the tests devised to show that the at-issue content of **Mod(p)** is **p**. For the sake of clarity, we introduce below a new set of examples of this kind:

Test 1: *Assent with positive continuation*
(40)   A. A medida   que el niño   progresa en sus capacidades **va   pudiendo**
          to measure that the child progress in its abilities   go.PRES.3SG CAN.GER
       conservar dentro de sí la seguridad de la existencia de la madre
         keep.INF   inside of itself the certainty of the existence of the mother
       B. # **Es   **cierto, el niño **va   conservando** esa seguridad.
          be.PRES.3SG right   the child go.PRES.3SG keep.GER   this certainty

'A. As the child's capacities increase, it becomes able to maintain in his inner
being   the certainty of its mother's existence
B. Right, he maintains this certainty'

The unacceptability of B's response shows that *p* does not justify assent to *Mod (p)*.
It may be inferred that the modal belongs to the at-issue-content of *Mod (p).*

Test 2: *Answer to a polar question*
(41)   A. ¿**Va   teniendo que tomar** decisiones?
            go.PRES.3SG have.GER   that take decisions
        B. #Sí, **va   tomando** decisiones/ #No,   no **va   tomando**
            Yes, go.PRES.3SG   take.GER decisions/No, not go.PRES.3SG   take.GER
        decisiones.
        decisions
        'A. Does s/he have to take decisions?
        B. Yes, s/he takes decisions/ No, s/he doesn't take decisions'

The unacceptability of B's response shows that the truth-value of *p* does not justify
the assertion of *Mod (p)* or of its negation*.* It may be inferred that the modal belongs
to the at-issue-content of *Mod (p)*.

Test 3: Answer to the Question Under Discussion
(42)   A. ¿Quién se **iba   encargando**   de cosas más importantes?
            who REFL go.IMPF.3SG take-charge.GER of things more important
        B. #El asistente se **iba   teniendo que encargar**   de cosas más
            the assistant REFL go.IMP3SG have.GER that take-charge of things more
        importantes.
        important
        'A. Who was taking upon himself ever more important things?
         B. The assistant had to take upon himself ever more important things'

(43)   A. ¿Cuánta   gente **van   estafando**?
            how-many people go.PRES.3PL cheat.GER
        B. #**Van   pudiendo estafar** cada vez menos gente.
            go.PRES.3PL CAN.GER   cheat   each time less people
        'A. How many people have they cheated up to now?
        b. They are able to cheat less and less people'

In both examples, the unacceptability of B's response shows that *Mod(p)* is not an
adequate answer to a **QUD** concerning *p.* It may be inferred that the modal belongs to
the at-issue-content of *Mod (p).*
    Interestingly, both the preference effect and the difficulty/unexpectedness effect
(see examples (38) and (39) above) disappear in the examples that fail the tests
devised to show that the modal does not belong to the at-issue content. Absence of the
preference effect makes continuations either asserting or denying the preference both
felicitous (44a) or both infelicitous (44b):

(44)   a. El asistente se iba teniendo que encargar de cosas más importantes, como
        quería/aunque no quería.

'The assistant had to take upon himself ever more important things, as he wished/though he didn't wish to'

b. El niño va pudiendo conservar la seguridad de la existencia de su madre, #como quería/#aunque no quería.
'The child becomes able to maintain in his inner   being the certainty of its mother's existence, as he wished/though he didn't wish to'

Absence of the difficulty/unexpectedness effect is evidenced by an example such as (45), which parallels (39b) above: if someone can cheat on a certain number of people, it is to be expected that she can cheat on a lesser number of people, but nonetheless, (45) is acceptable:

(45) **Van pudiendo estafar** cada vez menos gente.
     ' They are able to cheat less and less people'

The fact that the preference and the difficulty/unexpectedness effect disappear when the modal belongs to the at-issue content provides further evidence for these effects as byproducts of the not-at-issue status of the modal.

4.2. The semantics of aspectualized modality readings
As stated in the introduction, this paper is descriptive and exploratory in nature. Therefore, I will not attempt to provide a full-fledged analysis of aspectualized modality. I will concentrate instead on two issues, the temporal structure of modalized eventuality descriptions and its interaction with aspectual operators, on the one hand, and the existence of implicative readings with aspectualized modality, on the other.

4.2.1. On the temporal structure of modalized eventuality descriptions
Aspectualized modality readings pose the problem of reconciling the semantic contribution of the aspectual operator with the semantic contribution of the modal. As stated in section 2.2. above, **INCR**, **HAB** and **PROG** are standardly characterized as operators taking eventuality descriptions as their input and returning either eventuality descriptions or properties of times as their output. Furthermore, they exert some selectional restrictions on the temporal structure of their input. Modal verbs, in the Kratzerian tradition, are standardly defined as quantifiers on a domain of possible worlds which is contextually restricted by a conversational background (modal base and ordering source). Let us assume, following Hacquard (2006, 2009), that root modals apply to eventuality descriptions in order to obtain modalized eventuality descriptions, with definitions such as (46ab), repeated here for convenience from section 2.1:

(46)   a. [|poder|] = $\lambda P_{<l,\,t>} \lambda e. \exists w'$ compatible with circumstances in w: P (e,w')
        b. [|tener-que|] = $\lambda P_{<l,\,t>} \lambda e. \forall w'$ compatible with circumstances in w: P (e,w')

The question that arises is whether modalized eventuality descriptions have a temporal structure of their own, which may differ from that of the eventuality description they apply to. What the definitions above say is that modal verbs applied to an event description P return properties of events which in some, resp. in all worlds are P events. If we have to determine the temporal structure of modalized event

descriptions, we cannot but assume that they are states. They are, at the very least, totally homogeneous down to instants, or segmentally homogeneous (Landman 2008), which is the hallmark of stativity. This squares well with the general intuition that modal verbs, if they have at all a temporal structure, have the temporal structure of states: if you have an ability or an obligation for an interval I, you have this ability or this obligation at all the subintervals of I, down to its minimal segments.[12]

The aspectual operators **INCR**, **HAB** and **PROG** are all three problematic, though in different ways, when applied to states, either as a matter of selectional restrictions or as a matter of redundancy of their semantic contribution.[13] More importantly, they give rise to rather well-known specific meaning effects in such combinations. If we find the same specific meaning effects in aspectualized modality readings, this constitutes indirect evidence for the stativity of modalized event descriptions.

And this is indeed what examination of an extensive corpus shows. Let's first look at [PROG-MOD] combinations. **PROG** is said to resist combinations with states. When such combinations are at all acceptable, they give rise to two main meaning effects, reinterpretation of the state as gradual change, as in (47a), and what is known as the temporal contingency effect, as in (47b):

(47)   a. John is liking this novel [more and more].
        b. John is living with his parents [for the time being].

Note that the expressions in brackets are not obligatory, they are just introduced in order to help pin down the targeted construal.

Reinterpretation of a state predicate as gradual change requires a scalar structure, which can be contextually supplied by a gradable state or by an increasing number of occasions or participants of which the state holds. A number of examples of [PROG-MOD] combinations exhibit precisely this construal:

(48)   a. la genética como se la practica en estos momentos **está pudiendo transformar la** naturaleza humana a partir de concebir a la misma como pura información, como un código, y los experimentos cada vez dan más resultados.
        'Genetics, as it is practiced nowadays, is able to transform human nature by conceiving it as pure information, as a code, and experiments are giving more and more results'
        b. viendo la velocidad vertiginosa a la que la tecnología **está pudiendo realizar** proyectos que nunca imaginamos que existirían.
        'seeing the incredible speed at which technology is carrying out projects we had never thought possible'

Through the temporal contingency effect, the state is understood as holding exclusively of the reference interval, having set on at some unspecified previous time

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[12] Homer (2009) has forcefully argued for the stative nature of modalized event descriptions, on which he relies for treating actuality entailments as derived from the coercion of a state into a non-stative predicate.

[13] Cf. Deo (2015) for an analysis of combinations of the progressive with states, which in her system come out not as ungrammatical, but simply as pragmatically infelicitous because of their truth-conditional equivalence with the corresponding non-progressive sentence.

and being expected to cease at some time thereafter. Again, a number of examples of [PROG-MOD] combinations exhibit precisely this construal:

(49) a. Hasta ahora **está pudiendo sostener** esta situación gracias a que las
ventas continúan creciendo
'Up to now, it is able to sustain this situation because sales keep growing'
b. y sólo **están pudiendo abrir** los bancos gracias a este rescate de
Europa y a la confiscación mencionada
'and these days they are only able to open the banks due to European help and
the confiscation we've just mentioned'

As for **HAB**, it is incompatible with individual-level states: it requires a plurality of eventualities, and individual-level states are non-iterable for individual participants:

(50) a. *Juan suele   ser   rubio.
Juan use.PRES.3SG be.INF blond
*'Juan is usually blond'
b. *Pedro suele   saber   inglés.
Pedro   use.PRES.3SG know.INF English
*'Pedro can usually speak English'

Generic arguments, however, warrant the introduction of pluralities of individual-level states, whose members differ in the participants in each state. **HAB** has the same behavior as an unselective quantifier which has been described for adverbs of quantification (Lewis 1975), in as far as it may be interpreted with a nominal restrictor:

(51) a. Los holandeses **suelen**   **ser** rubios.
the Dutch   use.PRES.3PL be.INF blond
'The Dutch are usually blond'
b. Un adolescente de hoy   en día **suele**   **saber**   inglés.
a teenager   of today in day use.PRES.3SG know.INF English
'A contemporary teenager can usually speak English'

An important proportion of attested examples of [HAB-MOD] combinations have generic arguments and nominal restrictor construals:

(52) a. La gente   con automóvil **suele**   **poder** **pagar** más que
the people with car   use.PRES.3SG CAN.INF pay.INF more than
gente que no tiene uno.
people that not have one.
'People with cars are usually able to pay more than people who don't own one'
b. La historia de una radio **suele**   **poderse**   **plasmar**   en un
the history of a radio   use.PRES.3SG CAN.INF. +REFL capture.INF in a
gráfico de audiencias.
graph of audiences
'The history of a radio can usually be captured by an audience chart'

Finally, the problem posed by **INCR** in aspectualized modality readings is not so much that of having states as its input (we have just seen that states may be

contextually associated with scalar structures), but it relates to **INCR**'s output. **INCR** returns eventuality descriptions with a specific temporal structure, that of degree achievements. This conflicts with the very notion of (existential or universal) quantification over a contextually restricted domain of worlds, which is not gradable.

In fact, Lassiter (in press) observes that some modal expressions, such as *be able to* and *necessary* are both conceptually and grammatically gradable, and that this should have consequences for the analysis of modal verbs. In the light of the debate surrounding graded modality, [INCR-MOD] combinations appear particularly interesting. The question that arises here is what exactly increases when possibility or necessity are represented as increasing. Providing an answer to this question widely exceeds the limitations of this contribution, so that we only advance the following two observations:

(a) Cases in which it is the degree of possibility that increases are not frequent, and they are all instances of 'ability'-*can.*[14] Both examples in (53a-b) make reference to the gradual acquisition of an ability:

(53)   a. A medida que el niño progresa en sus capacidades **va pudiendo conservar** dentro de sí la seguridad de la existencia de la madre.
    'As the child's capacities increase, it becomes able to maintain in his inner being the certainty of its mother's existence'
    b. Y ya   **voy**   **pudiendo cantar** a la primera partituras nuevas
    and already go.PRES.1SG CAN.GER sing.INF to the first partitures new
    que nos dan en el   coro.
    that us give in the choir
    'And I'm already able to sing at the first try the new partitures we get in the choir'

(b) In most cases, what increases cumulatively are the opportunities or occasions which render the action described in the VP possible or necessary ('opportunity'-*can/have to*):

(54)   a. y ve   terminando dichas tareas a medida que
    and go.IMP.2SG finish.GER said tasks   to measure that
    vayas   **pudiendo**.
    go.PRES.SBJ.2SG. CAN.GER
    'Do finish these tasks as you get the occasion'
    b. es   el hombre quien va   configurando su personalidad
    be.PRES.3SG the man who GO.PRES.3SG configure.GER his personality
    a medida que **va**   **teniendo que tomar** decisiones
    to measure that go.PRES.3SG have.GER that take.INF decisions
    'It is the man that gradually configures his personality as he is forced to take decisions'

To sum up, the meaning effects obtained in [PROG-MOD] and [HAB-MOD] combinations parallel those that are known to arise when the aspectual operators involved apply to states. The interpretation of naturally occurring examples of [INCR-MOD] combinations reveals a link with occasions of performance of the action

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[14] See Rubio Vallejo (2017) on the distinction between 'ability' and 'opportunity' *can.*

described by the VP. This last observation leads us to our next and last point, the existence of implicative readings in aspectualized modality.

4.2.2. Implicative readings of aspectualized modality.

That implicative readings arise when the modal does not belong to the at-issue content of the utterance is predictable: the utterance is meant to convey the prejacent, that is to say, the very content of the entailment defining an implicative reading. But implicative readings also arise when the modal - according to the tests employed in this research - does belong to the at-issue content. Thus (55a-c) are felt to be incoherent because one of the conjoined sentences negates the prejacent:

(55) a. ??A medida que el niño progresa en sus capacidades **va pudiendo** conservar dentro de sí la seguridad de la existencia de la madre, pero no la va conservando/ no la conserva.
'As the child's capacities increase, it becomes able to maintain in his inner being the certainty of its mother's existence, but it does not maintain it'
b. ?? Hasta ahora **está pudiendo sostener** esta situación gracias a que las ventas continúan creciendo, pero no la está sosteniendo.
'Up to now, s/he is able to sustain this situation because sales keep growing, but s/he is not sustaining it'
c.   ?? Cuando comete   un error de fundamentos,
   when make.PRES.3SG a mistake of foundations
   suele   poder arreglarlo   con su capacidad atlética,
    use.PRES.3SG CAN.INF fix.INF+it   with his capacity athletic
   pero no suele   hacerlo/   no lo hace.
    but not use.PRES.3SG do.INF+it /not it doPRES.3SG
'When s/he makes a basic mistake, s/he is usually able to fix it relying on her/his athletic skills, but s/he does not do it'

As shown by the following examples, not all instances of aspectualized modality give rise to implicative readings:

(56) a. El asistente **se iba teniendo que encargar** de cosas más importantes, pero no lo hacía.
'The assistant had to take upon himself ever more important things, but he didn't do it'
b. Hoy día [...] casi toda la gente **está pudiendo optar** a mejores trabajos, pero no lo están haciendo/ no lo hacen.
'Nowadays almost everybody is in a position to choose better jobs, but they aren't   doing it/ they don't do it.'
c. Se **suele   poder   hablar** directamente con el creador del curso
  REFL use.PRES.3SG CAN.INF talk.INF directly with the creator of+the course,
pero nadie lo hace
but nobody it-does.
'Usually, it is possible to talk directly to the course creator, but nobody does it'

This situation suggests that there are two different sources for implicative readings: not-at-issueness of the modal is one source, but there is a second one to be found in some, but not all instances of aspectualized modality. Moreover, the emergence of implicative readings when the modal is at issue and aspect is either **PROG** or **HAB** apparently conflicts with the explanation proposed by Bhatt (1999) and Hacquard (2006, 2009) as to why the actuality entailment disappears in modals bearing imperfective morphology. According to both authors, it is a second layer of modality introduced by imperfective aspect that prevents the actuality entailment. But then, **PROG** and **HAB** are undoubtedly modal in nature, and nonetheless they do give rise to implicative readings.

What both Bhatt (1999) and Hacquard (2006, 2009) actually discuss when alluding to imperfective aspect is the generic operator which may be associated with it. Their reasoning goes as follows: the generic operator does not require actual occurrences of the VP- event in the world of evaluation, as shown by sentences (57a-b):

(57) a. María trataba el correo proveniente de la Antártida (pero nunca llegaba correo de la Antártida).
    'María handled the mail from Antarctica (but no mail from Antarctica ever arrived)'
    b. Esta máquina exprime naranjas (pero todavía no se ha utilizado).
    'This machine crushes oranges (but it hasn't been put to use yet).

Therefore, the actuality entailment is prevented in (58) because the generic operator associated with imperfective aspect does not require any actual instantiations of the event description.[15]

(58)   Juan podía   comprarse   una casa.
    Juan CAN.IMPF.3SG buy.INF.+REFL a house
    'Juan could buy a house'

Notice, however, that the property of not requiring the actual occurrence of VP-events does not hold for **PROG** and **HAB**, although both are imperfective and modal. Thus, (59a-b) imply, in contrast with (57a), that there are actual instances of Mary's handling the mail from Antarctica, and therefore, that some mail arrives from Antarctica:

(59)   a. María **estaba   tratando** el correo proveniente de la Antártida.
    Maria   be.IMPF.3SG handle.GER the mail provenient from Antarctica
    'Maria was handling the mail from Antarctica.
    b. María **solía   tratar**   el correo proveniente de la Antártida.
    Maria   use.IMPF.3SG handle.INF the mail provenient from Antarctica
    'Maria used to handle the mail from Antarctica'

Apparently, only the imperfective past or the present may express "pure", i.e. non-instantiated dispositions. As shown by (59a-b), **PROG** and **HAB** require some event instantiations in the world of evaluation. But then, we only have the beginning of an explanation as to why implicative readings may arise in [PROG-MOD] and [HAB-

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[15] In Hacquard's approach, this is captured by assuming that the world variable introduced by Aspect is bound by the generic operator, that is to say, it does not remain free and cannot therefore be identified with the world of evaluation.

MOD] combinations when the modal belongs to the at-issue content of the utterance. More specifically, we are not accounting for the fact that such readings arise under some circumstances, but not accross the board (cf. (56b-c) above).

I will not attempt to provide such an account in this paper. But I'd like to point out the moral which tentatively emerges from this overview of the relationship between implicative readings and [ASP>MOD>VP] combinations: implicative readings cannot be assimilated to entailments in any standard sense of entailment, but appear to be a matter of pragmatics. This is clearly the case when they are a byproduct of the not-at-issueness of the modal content - something that can only be ascertained by determining which the main point of the utterance in context is. And it is probably also the case that a number of pragmatic factors concerning agentivity, reasonable preferences and reasonable behavior in the light of such preferences, as well as the grounds on which we make ability ascriptions, contribute to enforce implicative readings when the modal does belong to the at-issue content of the utterance.

5. Concluding remarks.

Combinations in which a modal periphrasis is preceded by an aspectual periphrasis have been shown to challenge a uniform architecture for modal-temporal interactions in which modals merge above Aspect. Instead, they provide some evidence in favor of architectures in which root modals merge below Aspect and have modalized eventuality descriptions as their output, as advocated in Hacquard (2006, 2009). The meanings of these combinations in context reveal a rather clear split between aspectualized VP readings, in which the modal is transparent to the influence of the aspectual operator, and aspectualized modality readings, in which it is possibility or necessity itself which acquires a certain aspectual profile. An adaptation of the diagnostics developed in Tonhauser (2012) allows to identify aspectualized VP readings as cases in which the modal does not belong to the at-issue-content of the utterance and, correspondingly, aspectualized modality readings as cases in which the modal indeed belongs to the at-issue-content. Aspectualized VP readings are -as it is to be expected- invariably implicative, whereas aspectualized modality readings may be implicative or not. The semantic effects that arise in aspectualized modality readings parallel those in which the aspectual operators **INCR**, **PROG**, and **HAB** take states as their argument, thus providing indirect evidence for the claim that modalized eventuality descriptions are stative.

These are the main results of the descriptive work undertaken in this paper. They leave open a number of important theoretical questions on which much further work is needed, concerning in particular the possibility of a compositional analysis for aspectualized VP readings and the possible existence of different sources for implicative readings of modals.

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