True precision required

Adjectives of veracity in Spanish as imprecision regulators⋆

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Abstract. The aim of this paper is to offer an analysis of adjectives of veracity in Spanish (*verdadero* 'true', *auténtico* 'authentic') that accounts for their modification of nouns in terms of imprecision regulation. Slack regulators are elements that signal the intended degree of precision in the use of an expression to describe a situation. In order to account for this fact, I will adopt [26]'s framework, which allows to directly compare and modify degrees along a scale of imprecision. Under this framework, expressions denote sets of alternatives whose size depends on the degree of precision of the context. *Verdadero* and *auténtico* are argued to be degree modifiers affecting this scale of imprecision by setting the degree of precision of the context to a high value, forcing the modified noun to be interpreted in a strict sense.

Keywords: adjectives of veracity, imprecision, degrees, alternatives

1   Introduction

Language is normally used with varying degrees of (im)precision, and we employ expressions in circumstances in which they would be considered to be false, strictly speaking. Slack regulators are expressions that serve to fix the amount of slack that is afforded in judging an utterance 'close enough to true' in a concrete situation (in [22]'s terms) and, in this sense, they affect the truth conditions of the sentence in which they appear. They can be grouped according to whether they increase or reduce the degree of allowed imprecision: hedges such as *loosely speaking* or *sorta* expand the set of permitted referents of an expression to normally ignorable ones (see [21]; [3] for *sorta*); other regulators such as *exactly* or *perfectly* shrink that set to those referents in the strict denotation of the modified predicate. This paper focuses on adjectives of veracity (*verdadero* 'true',

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auténtico 'authentic') in Spanish[1] as belonging to the latter class of slack regulators. Specifically, I will argue that they set the degree of precision of a context to a high value.

The aim of this paper is to offer an analysis of adjectives of veracity that accounts for their modification of nouns in terms of imprecision regulation. Slack regulators are interesting because, as they signal the intended degree of precision in the use of an expression to describe a situation, they can be understood as part of a pragmatic mechanism. However, at the same time, they have influence in truth conditions and they must be thus part of compositional semantics. In other words, slack regulation stands in the border between semantics and pragmatics. In order to account for these facts, I will adopt [26]'s framework, which reformulates the pragmatic-halos theory of imprecision of [22] in terms of a Hamblin alternative semantics ([11]). As a consequence, I will assume that expressions denote sets of alternatives[2] whose size depends on the degree of precision of the context. This framework allows to directly compare and modify degrees along a single scale of imprecision.[3]

This paper is organized as follows: Section 2 presents the data on adjectives of veracity in Spanish and argues for a slack regulation account. In Sect. 3, I provide the theoretical background, which is formalized in Sect. 4. Section 5 concludes.

2 Adjectives of veracity

2.1 Interpretation and distribution

Adjectives of veracity such as Spanish *verdadero* 'true' or *auténtico* 'authentic', when in prenominal position, have an intensifying effect on the modified noun. The natural interpretation of an example like (1) is that Paloma is an artist in a strict sense, this is to say that Paloma is not just someone who merely paints or works with her hands, but presents every quality the context associates with being an artist: creativity, originality, perspicacity, maybe success.

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[1] Adjectives in Spanish and Romance languages can appear both prenominally and postnominally. The type of modification we are dealing with here is only present in prenominal position (see (2)-(3)). In any case, the analysis may be extended to equivalent modifiers in English and other languages.

[2] The alternatives in the denotation of an expression need not to be lexical items. In some cases, we use a slack regulator because we lack a lexical item to refer to a specific object, such as for *sorta kick the ground* ([3]). As a reviewer points out, however, sometimes the context does not require us to be precise, as happens in the use of round numerals (*The distance between Amsterdam and Vienna is 1,000 kilometres* vs. *The distance between Amsterdam and Vienna is 965 kilometres*) ([20]).

[3] We are considering here vagueness and imprecision to be two different phenomena. Both involve uncertainty about where cut-off points in the denotation are located, but a vague predicate shows contextual variability in truth conditions, borderline cases, and gives rise to the Sorites paradox, whereas an imprecise use of a predicate has the two former characteristics, but it is not easily associated with Sorites sequences and can be given natural precisifications (see [16], [31], a.o.).

(1) Paloma es una verdadera / auténtica artista.[4]
     Paloma is a   true   / authentic artist
     'Paloma is a true / real artist.'

This type of modifiers appear only in prenominal position in Spanish. Their modification is different from that of *true* or *authentic* in their literal sense ('not false'), which is mainly restricted to postnominal or predicative position. For instance, according to (2a), the pain Paloma felt is a real one, not imaginary; whereas for (2b), the pain is a true pain, an intense one, not simple discomfort, or a twinge. The distribution of postnominal *verdadero*, on the contrary, is restricted to those entities that can be either true or false (3).

(2) a. Paloma sintió dolor auténtico. / El   dolor era auténtico.
         Paloma felt   pain authentic / The pain was authentic
         'Paloma felt real pain.' / 'The pain was real.'

     b. Paloma sintió auténtico dolor.
         Paloma felt   authentic pain
         'Paloma felt real pain.'

(3) a. ?? Un periodista verdadero.
            a   journalist true

            'A real journalist (not a fake one).'

     b. ?? Una tortura auténtica.
            a   torture authentic

            'A real torture (not a fake one).'

Modification by *verdadero* and *auténtico* has a scalar flavour, in the sense that Paloma seems to have a greater amount of 'artistness' (whatever that may consist of) than any other relevant artist, so she is in the upper part of a scale of artists ordered by this salient property. Adjectives of veracity appear with nouns that have been considered candidates of gradable nouns: nouns that categorize individuals based on a gradable property (4) and abstract mass and count nouns (5) ([7], [8]).

(4) a. Lucía es una verdadera entusiasta de las tragedias clásicas.
         Lucía is a   true   enthusiast of the tragedies classic

         'Lucía is a true Greek tragedy enthusiast.'

     b. Juan es un auténtico idiota.
         Juan is a   authentic idiot

         'Juan is a real idiot.'

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[4] Note that the indefinite article slightly changes the sense of the sentences. *Paloma es artista* (lit. 'P. is artist') simply states Paloma's occupation, while *Paloma es una artista* 'P. is an artist' adds an affective nuance to the statement (see [23], and references therein).

(5)   a. Tutoriza a   sus alumnos con verdadera dedicación.
              tutors   PREP her students with true   dedication

             'She tutors her students with true dedication.'

       b. Hay   una auténtica dificultad en distinguir   una explosión
              there.is a   authentic difficulty in distinguish-INF a   explosion
              nuclear y   un terremoto.[5]
              nuclear and a   earthquake

             'There is a real difficulty in telling apart a nuclear explosion from an earthquake.'

However, adjectives of veracity combine with other types of nouns as well, such as concrete count nouns (6) or deverbal nouns (7). The sense of scalarity is also present in these examples: the referent of the modified noun is understood as close to the core notion denoted by the predicate. For example, a true revolution (7a) fulfils every requirement to be considered so, i.e. is a revolution in a strict sense.

(6)   a. Quiero   que seas   un verdadero padre para mi hijo.[6]
              want-1S-PRES that be-2S-SUBJ a   true   father for   my son

              'I want you to be a true father for my child.'

       b. La   casona es una auténtica casa rural al   estilo del
              The villa   is a   authentic house rural PREP.the style of.the
              siglo   XIX.[7]
              century 19th

              'The villa is a real rural house with a 19th century style decoration'.

(7)   a. Las compañías de bajo coste han   supuesto una
              the companies of low   cost   have-3PL-PRES supposed a
              verdadera revolución en el   transporte aéreo.[8]
              true   revolution in the transport aerial

              'Low-cost companies have brought about a true revolution to air transport.'

       b. Aquella victoria se   ha convertido en una auténtica derrota. [9]
              that   victory REFL has turned   in a   authentic defeat

              'That victory has become a real defeat.'

Finally, with a small set of nouns and the definite article, *verdadero* (*auténtico* only to a lesser extend) receives a literal interpretation ('not fake') (8). For

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[5] http://eldia.es/2012-03-24/AGENDA/3-D-decia-marzo.htm

[6] *The Angels' Share* (Ken Loach, 2012)

[7] http://www.toprural.com/Miguel/opini%C3%B3n-Mas-Masaller_278426_o.html

[8] http://www.iet.turismoencifras.es/transporte/item/89-la-revoluci%C3%B3n-de-las-low-cost.html

[9] http://www.tonibosch.com/la-lucidez-del-perdedor/

example, in (8a), the person Paloma wants to know is her biological father, not any other man who may have raised her.[10]

(8) a. Paloma quiso   conocer   a   su verdadero padre. (cf (6a))
         Paloma wanted know-INF PREP her true   father
         'Paloma wanted to know her actual father.'

     b. Impuso   la condición de que   se   ocultara   al
         Imposed-3s the condition of COMP IMPRS hide-3s-SUBJ PREP.the
         niño su verdadera identidad.[11]
         child his true   identity
         'He imposed the condition that the child should never know his true identity.'

Adjectives of veracity combine with a wide range of nouns with an intensifying effect that involves some sense of ordering. As opposed to what happens in the adjectival domain, the issue of whether gradability is represented in the lexical semantics of nouns is a controversial issue.

[30] puts forward that all nouns are gradable at the conceptual level (entities in their denotation are ordered according to their typicality), but that this ordering is not accessible by linguistic means, except for a small class of adjective-like nouns, such as *idiot*. Some other authors ([7], [24], [25]) have also acknowledged the existence of a class of degree nouns based on tests such as modification by size adjectives ((9a), cf. (9b)) or combination with the degree operator *such* ((10a), cf. (10b)). An opposite view is that of [8], who argues that these environments are actually sensitive to factors other than the presence of a degree argument, such as expression of a value judgement.

(9)   a. George is an enormous idiot. [25]

      b. # This is an enormous room.

(10) a. The calculation was no good at all, he made such a mistake! [7]

      b.   * This man is such a person! [8]

In some of their uses, adjectives of veracity seem to be modifying the degree of the property denoted by the noun, like in *un verdadero idiota* 'a true idiot' and the examples in (4). We could then posit two *verdadero*s: a degree modifier of gradable nouns (see [25], [33]) and a slack regulator for non-gradable nouns.[12] However, this option is less economical than having a sole entry for *verdadero*

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[10] I am assuming that the possessives in (8) are definite ([12]), as their impossibility to appear in existential constructions shows (i).

(i)   * Hay   su padre en la   cocina.
        Have-3s-PRES his father in the kitchen
        Lit. 'There is his father in the kitchen.'

[11] *Cien años de soledad*, Gabriel García Márquez (1967)

[12] I come back to this option in Sect. 4.2.

and, as I will argue in Sect. 2.2, the type of modification adjectives of veracity perform in the noun is better captured under a slack regulator analysis.

2.2 Adjectives of veracity as slack regulators

Slack regulators ([21], [22]; see Sect. 3.1) are modifiers that control the imprecision that is required to interpret an utterance and can be ordered according to how precise they force the modified expression to be. The example in (11) shows an ordering from Paloma being an artist in a strict sense [maximal degree of precision] (11a) to being sort of an artist, but not really so [low degree] (11c).

(11) a. Paloma es una artista en sentido estricto.
          Paloma is a artist in sense   strict
          'Strictly speaking, Paloma is an artist.'

      b. En cierto modo, Paloma es una artista.
          In certain manner Paloma is a   artist
          'In a way, Paloma is an artist.'

      c. Paloma es algo   así   como una artista.
          Paloma is something like.that as   a   artist
          'Paloma is sort of an artist.'

In this scale, adjectives of veracity are close to slack regulators that restrict the afforded amount of imprecision, such as *strictly speaking* or *perfectly*. Combining any of these modifiers with *verdadero* results in redundancy (12a). Also, there is a contradiction in stating that someone is a true artist but not strictly speaking (12b).

(12) a. ??Paloma es una verdadera artista en sentido estricto.
          'Paloma is a true artist in a strict sense.'

      b. Paloma es una verdadera artista, #pero no en sentido estricto.
          'Paloma is a true artist, but not in a strict sense.'

However, compared to *strictly speaking*, adjectives of veracity seem to require a high rather than a maximal precision in the interpretation of the modified predicate. In (13), other referents are allowed to be ranked higher in the precision scale than the referent of the noun: here, Lucía is said to be an artist in a stricter sense than Paloma is, although Paloma is already an artist in a strict sense.[13] Observe, though, that the sentences are felicitous when used with *but* but they would be odd when *and* is used instead. This may point to the fact that a maximal precision is expected from the use of *verdadero*, but this expectation is cancelled by means of the adversative connective (see [4], [34], a.o.).

(13) a. Paloma es una verdadera artista, {pero/??y} Lucía lo es más.
          Paloma is a   true   artist but/and   Lucía it is more
          'Paloma is a true artist, but/and Lucía is more of an artist than her.'

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[13] I thank two anonymous reviewers for pointing this out.

  b. Es un verdadero placer tenerla entre las manos.
    is a true   pleasure have.ACC between the hands.
    {Pero/??Y} todavía lo es más disfrutar de sus resultados.[14]
    But/And still it is more enjoy.INF of its results

    'It's a true pleasure having it in your hands. But it is even more to enjoy its results.'

  More evidence pointing in this direction is shown in (14): whereas *auténtico* or *verdadero* permit a figurative or metaphorical interpretation of the noun (14a), maximal slack regulators force a literal reading (14b). Entities that have properties associated with a palace (big size, luxury, etc.) without being strictly one are allowed in the denotation of *palace* and there is no contradiction in asserting that the house is not an actual palace, although it resembles one (14a). However, maximal precision is required in the case of *strictly speaking*, and no entities other than actual palaces can be in the denotation of the modified noun (14b).

(14) a. Su casa es un auténtico / verdadero palacio, pero no es un
    their house is a authentic / true   palace, but not is a
    palacio de verdad.
    palace of truth

    'Their house is a real palace, but it's not an actual palace.'

   b. Su casa es un palacio en sentido estricto, #pero no es un
    their house is a palace in strict sense, but not is a
    palacio de verdad.
    palace of truth

    'Their house is a palace in a strict sense, but it's not an actual palace.'

  Modification by adjectives of veracity in prenominal position in Spanish can thus be analyzed in terms of slack regulation. My proposal is that *verdadero* and *auténtico* fix the degree of precision of the context to a high value, and, consequently, the modified expression, whose set of alternatives has been shrunk, is interpreted in a stricter sense. To model this idea I will adopt [26]'s alternative semantics for imprecision framework, which is presented in Sect. 3. But before that, I will address a possible analysis based on modality, which I ultimately reject.

2.3 An epistemic analysis

Expressions with similar properties such as English *real(ly)* have been analyzed as epistemic operators ([28], [8]; see [6] for Washo *šemu*). Focusing on English *real*, [8] argues that the contribution of this adnominal modifier is to emphasize the speaker's commitment to the claim that the properties characteristically associated with the predicate P undoubtedly apply to the individual x.

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[14] http://www.finepix-x100.com/es/reviews/others/all?page=20

(15) $[\![real]\!] = \lambda P \lambda x \lambda w. P(x)$ in $w \wedge \forall w' \in Dox_{w,holder} : P(x)$ in w'

In particular, *x is a real P* is true only if x is in the positive extension of P in the speaker's belief worlds. A desirable consequence of this analysis is that it accounts for adjectives of veracity's wide distribution — not restricted to gradable nouns. Moreover, it allows to capture the epistemic commitment that their adverbial counterparts (*really, truly*) express in some of their sentential positions (see fn. 21; Sect. 4.3).

However, if adjectives of veracity were epistemic modals, it would be expected that they behave alike. The distribution of epistemic modals, especially regarding their embeddability, is restricted in some attitude contexts (see [27], [10], [2], a.o.). [2] show that epistemics are markedly degraded in the complement of desideratives and directives (16) in three Romance languages, including Spanish. By contrast, adjectives of veracity are licensed in these contexts.

(16) ??Juan {quiere / ha exigido} que sea probable que María
Juan wants / has demanded that is-SUBJ probable that María
haya conocido a su asesino.[15]
has-SUBJ known PREP her murderer
'John {wants / demanded} that it is probable that Mary knew her killer.'

(17) a. Kojima quiere que [su película] sea una auténtica
Kojima wants that [his film] is-SUBJ a authentic
superproducción de Hollywood.[16]
superproduction of Hollywood
'Kojima wants his film to be a true blockbuster.'

b. A un periodista se le exige que sea un verdadero
To a journalist REFL DAT demands that is-SUBJ a true
detonante de puntos de vista.[17]
trigger of points of view
'A journalist is required to really spark off new perpectives.'

Furthermore, modal quantification over doxastic worlds and quantification over contexts are not equivalent (see [22]) and there are reasons to believe that adjectives of veracity operate over contextual variables, such as the precision parameter. Under the epistemic view, *Paloma is a true artist* means that she is an artist in all believe worlds of the speaker, i.e. the speaker always considers Paloma to be in the positive denotation of *artist*. That sentence is felicitous in a situation where Paloma has prepared the perfect cappuccino (well-balanced, compact foam, with latte art). However, in a different context, with a different comparison class (for instance, piano players in an audition), Paloma would no

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[15] [2] only provide the French examples, I have reconstructed the Spanish versions.

[16] http://www.otromas.com/otras/pelicula-de-metal-gear-solid-confirmada-por-el-propio-kojima/

[17] http://digitaliatec.blogspot.com/2008/11/las-nuevas-exigencias-para-el.html

longer be considered an artist, even though that world is consistent with the speaker's beliefs.

In sum, an epistemic account of adjectives of veracity would have to explain why they can be embedded in contexts where epistemics are not generally licensed and is not appropriate to capture context shifts.

3   Alternative semantics for imprecision

3.1   Pragmatic halos

[22] models imprecision in terms of pragmatic halos. The denotation of each expression is associated with a set of objects of the same logical type that differ from the denotation only in some 'pragmatically ignorable' respect. For instance, the halos of *3 o'clock* would include times that are close enough to 3 o'clock not to make a difference, such as 2:57 and 3:02 and, as a consequence, in usual contexts, it is acceptable to utter (18), even if Mary arrived shortly after 3:00.

(18)   Mary arrived at 3 o'clock.

The degree of deviation or imprecision allowed is determined by the context, but can be also manipulated by some specific regulators. A slack regulator such as *exactly* in (19) shrinks the halo to those times that are closest to *3 o'clock* and forces the expression to be interpreted precisely. In this way, (19) is infelicitous in a situation where Mary arrived at 2:57.

(19)   Mary arrived at exactly 3 o'clock.

Adjectives of veracity will be analysed as slack regulators, with a shrinking effect in the halos of the modified expression. But first, an implementation of Lasersohn's proposal is detailed in the next section.

3.2   Alternative implementation

[26] recasts [22]'s pragmatic-halos theory of imprecision in terms of a Hamblin-style alternative semantics ([11]) to account for metalinguistic comparatives. For [26], the intuition behind metalinguistic comparatives is that they measure how precise a speaker is when using a particular word, i.e. they involve a comparison of degrees of precision. What (20) does then is to compare how precise is referring to George as dumb, rather than crazy.

(20)   George is more dumb than crazy. [26]

In this proposal, the cross-categorial 'approximates' relation $\approx$ holds between two objects in the model if they are sufficiently similar (21). To determine whether two objects are similar, a standard of similarity and a context that provides the scale of similarity are required, as different contexts impose different similarity orderings. The standard of similarity is construed as a degree d, a real number in the interval [0,1].

(21) $\alpha \approx_{d,C} \beta$ iff, given the ordering imposed by the context C, α resembles β to (at least) the degree d and α and β are of the same type.

This similarity relation is the basis of denotations that reflect degrees of imprecision. The interpretation function is parameterized to a degree of precision and a context, $[\![.]\!]^{d,C}$, and denotations are partially ordered sets of alternatives ranging from the d-resembling alternative to the perfectly resembling one. An expression such as *dumb* thus denotes the set of alternatives that resemble *dumb* sufficiently (22a). When *dumb* is interpreted in the highest degree of precision, 1, it will denote the singleton set containing only *dumb* (22b); when it is interpreted in the lowest degree of precision, it will denote all the alternatives of the same semantic type (22c).

(22)   a. $[\![dumb]\!]^{d,C} = \{f_{\langle e,t \rangle} : f \approx_{d,C} dumb\}$
        b. $[\![dumb]\!]^{1,C} = \{dumb\}$
        c. $[\![dumb]\!]^{0,C} = D_{\langle e,t \rangle}$

Accordingly, higher imprecision corresponds to a widening of a pragmatic halo, and higher precision to a narrowing of the denotation. To model pragmatic halos, [26] adopts [19]'s approach to Hamblin alternatives, according to which alternatives are part of the compositional semantics.[18] This sort of alternative framework requires some way of mapping a sentence denotation — a set of propositional alternatives — to a single proposition. [19] assume an existential closure operation (23) which can take place at intermediate points of the tree as well as at the top.

(23) $[\![\exists \alpha]\!]^d = \lambda w. \exists p [p \in [\![\alpha]\!]^d \wedge p(w)]$

As such, degrees of imprecision are not available for composition and do not play a role in the semantic derivation. In order to have access to this scale, [26] introduces a typeshift, called PREC (24) in his system.

(24) $[\![\text{PREC } \alpha]\!]^d = \lambda d'. [\![\alpha]\!]^{d'}$

PREC binds the degree of imprecision and makes it available as an argument. This typeshift applies as a last resort whenever there are certain type-theoretical or structural environments that require to make use of the imprecision scale, such as modification by *verdadero*, as I propose in the following section.

4   Proposal

4.1   Detour: adverbs of veracity

In order to determine what adjectives of veracity quantify over, I will first observe the behaviour of their adverbial counterparts *verdaderamente* 'truly',

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[18] This idea connects metalinguistic comparatives with work on focus (e.g. [29]).

auténticamente 'authentically', and *realmente*[19] 'really' with adjectives. I will assume a degree approach to gradability ([9], [32], [13], [15], a.o.), according to which degrees are part of the ontology, and gradable predicates include a degree argument in their structure and are of type $\langle d, \langle e, t \rangle \rangle$.[20] The degree argument is to be bound by an overt degree operator (comparative morphology, degree modifiers) or by a null degree operator POS for the positive form. Syntactically, gradable adjectives project an extended functional structure headed by degree morphology (25) ([1], [15], a.o.).

(25)
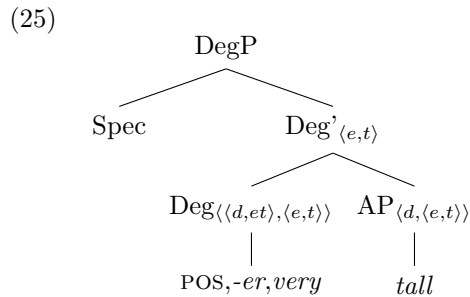
Verdaderamente, when combined with adjectives, is a degree modifier. As such, it occupies the degree head in the structure and, therefore, other degree morphology cannot appear in the same position, as the ungrammaticality of (26) shows. When the Degree head is occupied by another degree morpheme ((26b) and (26d)), *verdaderamente* is understood as affecting the whole proposition, with an epistemic reading.[21]

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[19] The adjective *real* 'real' used as a slack regulator is restricted to a few nouns (i)-(ii), probably due to homonymy with *real* 'royal'. The adverb is nevertheless widely used as a degree/epistemic modifier.

   (i)   Luego de casarse, su vida se le convirtió en un real tormento. [www.mujertuvalesmucho.org/testimoniojuanitalovil.html] 'After she got married, her life became a real torture.'

   (ii)   Él nunca deja de contestar nuestras plegarias, cuando son hechas con real intensidad. [books.google.es/books?isbn=9501701468] 'He never stops attending our prayers when they are said with real passion.'

[20] Gradable adjectives have been alternatively analyzed as measure functions $\langle e, d \rangle$ ([5], [15]). Although I do not adopt the measure function analysis, nothing in my proposal hinges on this decision.

[21] *Verdaderamente*, as well as in English *really*, has at least two readings depending on its position and what it quantifies over: an epistemic one affecting propositions (first *verdaderamente* in (i)) and a degree one modifying properties (second *verdaderamente*) (see [17]). I will focus on the latter. The former is marked with # in the examples. I will return to this distinction in Sect. 4.3.

   (i)   Verdaderamente estaba verdaderamente satisfecha con el trabajo. 'I really was really satisfied with the work.'

(26) a. *Lucía es más   verdaderamente alta que   Paloma.
          Lucía   is more truly   tall than Paloma

          'Lucía is more truly tall than Paloma.'

      b. #Lucía es realmente más   alta que   Paloma.
            Lucía is really   more tall than Paloma

          'Lucía is really taller than Paloma.'   [epistemic reading only]

      c. *Lucía es {completamente / muy} auténticamente alta.
          'Lucía is completely / very / authentically tall.'

      d. Lucía es verdaderamente {*completamente / #muy /} alta.
          'Lucía is truly completely / very / tall.'   [epistemic reading only]

The restriction adverbs of veracity impose on the degree argument of the adjective is similar to that of *very*, in that the relative standard is raised by some amount (27a)-(27b).[22] As was observed for adjectives of veracity in (13)-(14), the degree of the property denoted by the predicate is not fixed to its maximum in the scale. As (27b) and (27c) show, a fuller glass is conceivable when a closed scale adjective such as *full* is modified by *realmente* or *muy* 'very', but not when modified by a maximality modifier such as *completamente* 'completely'.

(27) a. Lucía es {verdaderamente / muy} alta, pero podría   serlo   más.
          Lucía is {truly   / very} tall, but   could-3s be.PRN more

          'Lucía is truly / very tall, but she could be taller.'

      b. El vaso está {realmente / muy} lleno, pero podría   estarlo más.
          the glass is   {really   / very} full, but   could-3s be.PRN more

          'The glass is really / very full, but it can be fuller.'

      c. El vaso está completamente lleno, #pero podría   estarlo más.
          the glass is   completely   full, but   could-3s be-PRN more

          'The glass is completely full, but it can be fuller.'

I will assume that the pairs of adverbs and adjectives of veracity such as *verdaderamente* and *verdadero* are instances of the same lexical root. As such, I will consider *verdadero* a degree modifier. The difference will lie in the type of degrees they quantify over: whereas the former is sensitive to the degree of a property that holds of an individual, the latter cares about degrees of imprecision in the use of a nominal expression.

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[22] The regular standard for a predicate is a degree calculated on the basis of a contextually determined comparison class. *Very* calculates the new standard by restricting the comparison class to entities which already have the property G in the context of utterance (see [18], [17], a.o.).

(i) $[\![very]\!]^c = \lambda G \lambda x. \exists d [\mathbf{standard}(d)(G)(\lambda y.[\![pos(G)(y)]\!]^c) \wedge G(d)(x)]$ [17]

4.2   Modification by adjectives of veracity

Adverbs of veracity have been shown to be degree modifiers that raise the standard of the adjective by some amount. Their adjectival counterparts have a similar effect on nouns, in the sense that the denotation is also restricted to individuals closer to the maximal value of the predicate. As discussed at the end of Sect. 2.1, (most) nouns do not seem to be lexically associated with a scale onto which they map their arguments, as adjectives do. If this is so, there should be a type mismatch between *verdadero* and the noun it modifies.

However, how appropriate or precise it is to apply a certain noun to a referent is something that can be graded ((28a) see also (11)) and compared (28b). This points to some sort of ordering associated with nouns. This ordering can be modelled as a scale of imprecision [26] and I propose that adjectives of veracity operate on this scale.[23]

(28)   a.   Paloma es una artista {en sentido estricto / en cierto   modo}.
            Paloma is a   artist {in sense   strict   / in certain manner}

            '{Strictly speaking / in a way}, Paloma is an artist.'

       b.   Paloma es más   una artesana que   una artista.
            Paloma is more a   artisan than a   artist

            'Paloma is more an artisan than an artist.'

In this framework, denotations consist of sets of alternatives (29) whose size depends on the standard of similarity of the particular context construed as a degree d ranging in the interval [0,1] (30). As can be observed in (30), the higher the degree of precision, the narrower the denotation of the predicate.[24] By abstracting over d and applying the $\approx$ relation, an ordering over sets of

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[23] As an anonymous reviewer points out, adjectives of veracity may have a degree use. If the modified noun had a degree argument, nothing in this analysis would prevent *verdadero* to target that degree, instead of forcing a typeshift that makes the precision parameter available for composition. In that case, the denotation in (31) would remain essentially the same, and the difference between *una verdadera casa* and *un verdadero artista* would be that, in the first case, it is the degree of the precision what is quantified over, whereas in the latter it is the degree of the property ('artistness' in this case) what is set to a high value. This would explain cases where stereotypical, rather than defining characteristics of the category denoted by the noun seem to be target by *verdadero*, such as with nationality nouns (i), an example pointed out by the reviewer. Another option is to understand this example as a metaphorical interpretation of the noun, as the one discussed in (14).

(i)   Arnold Schwarzenneger es un verdadero americano.
      'Arnold Schwarzenneger is a real American.'

Whether (some) nouns have a degree argument in their lexical representation is an issue beyond the purpose of this paper, so I will assume that adjectives of veracity are always slack regulators (see also Sect. 2.1; fn. 26).

[24] For the sake of illustration, I use lexical items in the representation of alternatives, but see fn. 2.

alternatives is generated. In the sense that these sets of alternatives can be understood as points in a general scale of imprecision, the denotation of any expression is gradable.

(29) $[\![artista]\!]^{d,C} = \{f_{\langle e,t\rangle} : f \approx_{d,C} artist\}$

(30)   a. $[\![artista]\!]^{0.9,C} = \{artist, creator, author\}$

     b. $[\![artista]\!]^{0.8,C} = \{artist, creator, author, artisan, designer\}$

     c. $[\![artista]\!]^{0,C} = D_{\langle e,t\rangle}$

The denotation of *artista* is thus build of partially ordered sets of alternatives of type $\langle e,t\rangle$ ranging from the d-resembling set of alternatives to the perfectly resembling one. This scale of imprecision is what provides a degree argument that can be targeted by slack regulators such as adjectives of veracity.

Adjectives of veracity can be analysed as modifiers fixing the degree of precision in a context to a very high value. This intuition can be formalized as follows: the standard of similarity is construed as a degree d, a real number in the interval $[0,1]$, so what *verdadero* does is to set the value of d to a value much higher (represented here by $>!$) than the standard of the context. As a degree modifier, *verdadero* takes an expression of type $\langle d, \langle e, st\rangle\rangle$ and returns a property ($\langle e, st\rangle$), which applies to an individual in a particular world or context.

(31) $[\![verdadero]\!]^{d,C} = \lambda P_{\langle d,\langle e,st\rangle\rangle} \lambda x \lambda w.\exists d'[d' >! d \wedge P(d')(x)(w)]$

The degree of precision being a parameter of the interpretation function is not accessible by any modifier. As mentioned in 3, typeshift PREC (24) is required to make that degree available for composition. However, PREC cannot apply to a *set* of properties by pointwise functional application[25] because PREC does not denote itself any set. Before PREC can apply to the denotation of the predicate, existential closure turns the set of alternative properties into one property (32). Then PREC transforms this property into something of type $\langle d, \langle e, st\rangle\rangle$ (33).

(32) $[\![\exists\, artista]\!]^{d,C} = \lambda x \lambda w.\exists f \in [\![artista]\!]^{d,C} \wedge f(x)(w)$

(33) $[\![\text{PREC}\ \exists\, artista]\!]^{d,C} = \lambda d'.[\![\exists\, artista]\!]^{d',C} =$
    $= \lambda d' \lambda x \lambda w.\exists f \in [\![artista]\!]^{d',C} \wedge f(x)(w)$

Now *verdadero* can apply to the noun (34). The result is the property of being an artist in a very precise sense in the given context, as *verdadero* fixes the degree of precision of being an artist higher than the standard of precision of the context (the index d).

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[25] In alternative semantics, compositionality makes use of a pointwise (or Hamblin) function application to generate alternative sets. The rule of composition adopted in this system is (i).

(i)   Hamblin Functional Application:
    If α is a branching node with daughters β and γ, and $[\![\beta]\!]^{d,C} \subseteq D_\sigma$ and $[\![\gamma]\!]^{d,C} \subseteq D_{\langle \sigma,\tau\rangle}$, then $[\![\alpha]\!]^{d,C} = \{b(c) : b \in [\![\beta]\!]^{d,C} \wedge c \in [\![\gamma]\!]^{d,C}\}$

(34) $[\![verdadero \ \textsc{prec} \ \exists \ artista]\!]^{d,C} =$
$= \lambda x \lambda w. \exists d'[d' >! \ d \wedge \exists f \in [\![artista]\!]^{d',C} \wedge f(x)(w)]$

Consequences. As predicted by the analysis, using the noun modified by *verdadero* with a degree of precision lower than required produces infelicitous utterances. Imagine a context where you are in your Spanish class and the teacher asks you to write a composition. The example in (35a) would be felicitous, while (35b) would be considered inappropriate, as not having a pen is not a problem in a strict sense in that context where other students can lend you one.[26]

(35) a. Tengo   un problema: me   he   dejado el   boli en
          Have.1S.PRS a   problem: DAT have-1S-PRES left   the pen in
          casa.
          house

          'I have a problem: I forgot my pen at home.'

      b. # Tengo   un verdadero problema: me   he   dejado
          Have.1S.PRS a   true   problem: DAT have-1S-PRES left
          el   boli en casa.
          the pen in house

          'I have a real problem: I forgot my pen at home.'

As the degree of precision is high, but not maximal, other referents with a higher degree of precision are possible, even if not expected. This explains the felicitousness of the example in (13a), where Lucía is said to be more of an artist than Paloma, who already is a true artist, with *but* but not *and*.

The scale of imprecision is a general one and the same for all expressions. Because of this fact, *verdadero* and *auténtico* show no restriction in the type of noun they modify (4)-(7). This also accounts for the absence of incommensurability effects in metalinguistic comparisons (*Clarence is more tall than boring*), in contrast with the ill-formedness of regular comparatives constructed from adjectives that measure along distinct scales (**Clarence is taller than he is boring*) (see [26]).

As we mentioned, a small group of nouns including *father* and *identity* receive a literal interpretation when combined with prenominal *verdadero* and the definite article ((8), repeated here).

(8b) Impuso la condición de que se ocultara al niño su verdadera identidad.
      'He imposed the condition that the child should never know his true
      identity.'

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[26] Here, as an anonymous reviewer notes, a slack regulation analysis, as opposed to a degree analysis of *verdadero* makes the prediction that small problems are not problems in a strict sense. My intuition is that that is right: A felicitous answer to the example in (35a) (without *verdadero*), would be (i).

(i) That's not a problem! I can lend you one.

One option is that *verdadero*, in combination with the definite article, turns into a maximal slack regulator, i.e. one that sets the degree of precision of the context to 1. In fact, if we compare the sentence with the adjective of veracity and the same sentence with *strictly speaking*, the meaning seems to be the same.

(36)   a. Arcadio Buendía es la   verdadera identidad del   niño.
            Arcadio Buendía is the true   identity   of.the child

        'Arcadio Buendía is the child's true identity.'

        b. En sentido estricto, Arcadio Buendía es la   identidad del   niño.
            in sense   strict,   Arcadio Buendía is the identity   of.the child

        'Strictly speaking, Arcadio Buendía is the identity of the child.'

However, to maintain compositionality, I will assume that the superlative reading is derived from the combination of *verdadera identidad* with the definite article (38). Following [14], I will take the definite article to be of type $\langle\langle e,t\rangle, e\rangle$ and a function that returns the unique individual in the denotation of the property (37).

(37) $[\![the]\!] = \lambda f : f \in D_{<e,t>} \wedge \exists! x[f(x) = 1]\ .\ \iota y[f(y) = 1]$ [14]

(38) $[\![la\ verdadera\ identidad]\!]^{d,C} =$
       $= \lambda w.\iota x \exists d'[d' >! \ d \wedge \exists f \in [\![identidad]\!]^{d',C} \wedge\ f(x)(w)]$

In an imprecise context, we refer to both fake and true identities by means of the noun *identity*. With the presence of *verdadero*, the degree of precision of the context increases, excluding from the denotation most fake identities (*identities* only in a loose sense). Then, the definite article introduces the requirement that the denotation of *verdadera identidad* has a sole individual. In this way, at degree of precision d' (which is high, but not necessarily maximal), only one identity remains in the denotation of the noun, the identity in the strictest sense in the context, which is equivalent to the actual identity.

To sum up, what adjectives of veracity do is to quantify over the degree of precision of the context and rise it to a very high value. As a consequence, the denotation (or halo) of the noun is shrunk to entities that resemble the predicate to at least this new degree, so this results in a stricter interpretation.

4.3   Back to adverbs of veracity

Now the analysis for adjectives of veracity has been developed, we can revisit adverbs of veracity and see whether the same denotation may apply to them. *Verdaderamente* and its kin appear with both open-scale and close-scale adjectives ((39a) and (39b) respectively) and their effect is similar to that of *very*, in that they raise the standard of the adjective to some amount.

(39)   a. Lucía es verdaderamente alta.
            'Lucía is truly tall.'

    b. El vaso está realmente lleno.
      'The glass is really full.'

In this case, the predicate already includes a degree argument, so this will be the degree pointed by the modifier. The denotation for *verdaderamente* would be basically the same as for *verdadero* (40).

(40) $[\![verdaderamente]\!]^{d,C} = \lambda P \lambda x \lambda w. \exists d'[d' >! \, \mathbf{standard}(P) \wedge P(x)(d')(w)]$

I will assume also here that existential closure maps the predicate's denotation (a set of alternatives) to a single predicate (42).

(41) $[\![alta]\!]^{d,C} = \{f_{<d,<e,t>>} : f \approx_{d,C} alta\}$

(42) $[\![\exists \, alta]\!]^{d,C} = \exists f : f \in [\![alta]\!]^{d,C}$

Now *verdaderamente* can modify the gradable adjective (43). The original value for the degree argument of the adjective is given by the **standard** function, as in degree accounts for gradable adjectives (e.g. [17]). *Verdaderamente* sets this degree to a much higher value.

(43) $[\![verdaderamente \, \exists \, alta]\!]^{d,C} =$
     $= \lambda x \lambda w. \exists d[d >! \, \mathbf{standard}(tall) \wedge \exists f \in [\![alta]\!]^{d,C} \wedge f(d)(x)(w)]$

Adverbs of veracity modifying non-gradable adjectives (44), as well as gradable ones already modified by a degree modifier ((26b), (26d)), results in an epistemic reading. In these cases, the predicates do not include a degree argument in their denotation. In contrast to other degree modifiers such as *very*, this modification does not result in coercion of the predicate into a degree one (45). The same epistemic reading is found in (46).

(44)   a. María está verdaderamente embarazada.
       María is   truly   pregnant

       'Truly, María is pregnant.' (never means 'she's very pregnant')

    b. ? Este es un asunto realmente geopolítico.
        This is a   issue   really   geopolitical

        'Really, this is a geopolitical issue.'

(45) María está muy embarazada.
     María is   very pregnant

     'María is very pregnant.' (she's in her last months of pregnancy)

(46)   a. Verdaderamente, el sacerdocio establecido no mostraba
       truly   the priesthood established not showed-3s
       afecto   alguno hacia   Santiago.[27]
       affection any   towards Santiago
       'Really, the official priesthood showed no affection at all for Santiago.'

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[27] http://hemeroteca.abc.es/nav/Navigate.exe/hemeroteca/madrid/cultural/1992/03/27/022.html

    b. Realmente me   he   quedado sin   palabras.
          really   REFL have-1S-PRS remained without words

          'Really, it has left me speechless.'

The examples in (44) and (46) might be accounted for if *verdaderamente* forces a type shift that makes the imprecision parameter of the whole proposition available for composition. I would like to suggest that, in these examples, the modifier is again setting the degree of precision to a high value, so that the proposition must be interpreted in a stricter sense. Nevertheless, the assimilation of epistemic modification by adverbs of veracity to imprecision regulation is an issue that deserves further study.

5   Conclusion and further issues

Alternative semantics has been shown to be useful to formalize the imprecise use of language and the phenomenon of slack regulation. It also brings together two manifestations of uncertainty in language — vagueness and imprecision – by associating them to gradability along different scales — lexical and imprecision. The proposal made here assumes the basis of the analysis of metalinguistic comparatives [26] and *sorta* [3], and applies them to related modifiers, such as adjectives of veracity in Spanish. *Verdadero* has been argued to be an imprecision regulator setting the degree of precision of the context to a high value.

The analysis may be extended to other related degree modifiers, such as *completa(mente)* 'complete(ly)' and *perfecta(mente)* 'perfect(ly)'. When combined with expressions associated with a lexical scale, such as adjectives and some verbs, they behave as regular degree modifiers (*The glass is completely / perfectly full*; *The army completely destroyed the city*). But whenever no lexical scale is available, they target the imprecision scale of the modified expression. This is the case with nouns and some verbs (*The complete family came* (cf. *The family came*); *Mary was perfectly convinced*). This suggests that there may be two types of gradability in language [26], and developing this idea would contribute to a better understanding of scalarity across grammatical categories and the difference between vagueness and imprecision.

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