Identity, Similarity, and Equatives

Abstract Based on the long observed syntactic resemblance between *same* and scalar equatives, this paper proposes a more fine-grained mapping between the two: *same*, which denotes an identity relation, is always selected by a null Deg° (i.e. an equative head). The current proposal has the advantage of deriving the internal reading of *same* straightforwardly via parasitic scope of the equative head, which leads to a unified analysis for the internal and external readings of *same*. Moreover, the proposal easily extends to a broader class of relational expressions, including *same*, *different*, *identical*, and equative phrases (e.g. *equally big*), and offers a simple answer to why they observe different licensing conditions for the internal reading.

1 Introduction

It has long been observed that identity terms like *same* (1) exhibit the syntax of comparatives, more specifically equatives like (2) (Heim 1985; Beck 2000; Alrenga 2006, 2007a; Matushansky 2010; Oxford 2010; Rett 2013; 2015; Hanink 2017b): English *same* employs the standard marker (or comparative linker) *as* which is also used in equatives; and it can take a (partially elided) comparative clause (*as Mary did*), which semantically provides the standard of comparison, cf. (1a, 2a). The standard can also be implicitly provided by a previously-mentioned discourse referent, cf. (1b, 2b).

(1) a. John met the same dog as Mary (did).
b. John met [a dog]$_i$. Mary met the same dog.

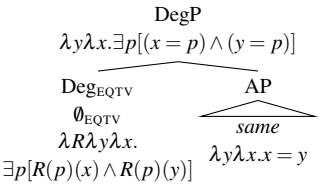
(2) a. John met as big a dog as Mary (did).
b. John met [a dog]$_i$. Mary met an equally big dog.

Despite some justifications for an equative analysis of *same*, it is not immediately clear in what sense *same* is an equative. Among the approaches which explicitly side *same* with equatives, two main directions are pursued: one is to analyze *same* as a lexical item that can syntactically select CP as one of the arguments—yet its semantics is a two-place predicate (type $\langle e, et \rangle$), denoting either an identity relation ($\lambda y \lambda x . x = y$ as in Oxford 2010; Hanink 2017b) or a maximal similarity relation ($\lambda y \lambda x . \forall P \in C[P(x) \leftrightarrow P(y)]$ as in Charnavel 2015)[1]; the other is to analyze *same* as the degree quantifier which is also involved in scalar equatives, and (1) and (2) only differ in the dimension of comparison: scalar equatives are restricted to a single, quantitative dimension like *size*; while *same* involves MULTIDIMENSIONAL comparison such that the measurement is on a scale of difference/similarity (Alrenga 2007a).

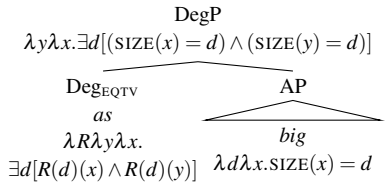
[1]Oxford (2010) and Hanink (2017b) differ from Matushansky (2010) in assuming that the syntactic category of this relational term is the Degree head, while the latter consider it a relational adjective. However, all these studies are similar in treating the semantics of *same* as a relation between entities.

This paper proposes a novel mapping between English *same* and equatives: *same* itself unambiguously denotes an identity relation that is always selected by a null Deg$^{\circ}$ (an equative head), which makes it structurally and semantically parallel to scalar equatives, sketched in (3).[2]

(3) a. Identity terms (e.g. *same*)



b. Equatives (e.g. *as big*)



Besides capturing the syntactic connection between *same* and equatives, the current analysis has the advantage of deriving the internal reading of *same* straightforwardly—by QR (Quantifier Raising) and parasitic scope of the equative head. The relevant reading of sentences like (4), when uttered out of blue, is called the INTERNAL reading of *same* since the standard of comparison is provided within the clause by a semantically plural argument (e.g. *the boys*, *each boy*, etc.), instead of being introduced by the comparative clause or a previously-mentioned discourse referent (EXTERNAL reading). It is often under debate whether a uniform and compositional analysis of the external and internal readings of *same* is desirable or even possible (Dowty 1985; Carlson 1987; Keenan 1992; Barker 2007; Brasoveanu 2011; Charnavel 2015 among others), and this paper provides one version of such an analysis.

(4) a. The boys met the same dog. (='The boys met the same dog as each other')
b. Each boy met the same dog. (='Each boy met the same dog as the others')

This analysis has implications on the broader issue of why a class of relational expressions, including *same*, *different*, *identical*, and equative phrases (e.g. *equally big*) differ in their licensing conditions for the internal reading, as shown in (5-6) (Beck 2000; Dotlačil 2010; Brasoveanu 2011; Brasoveanu & Dotlačil 2012; Charnavel 2015). While I agree with Charnavel (2015) in taking the contrast in (7) to be related to that in (5), a different explanation will be offered later.

(5) (Internal reading intended)
a. Each boy met {the same dog/a different dog/an equally big dog}.

[2] A note on framework and notation: This paper assumes a type-theoretic, compositional, extensional semantics with at least rules of function application and predicate modification for deriving the meaning of complex constituents (Heim & Krazter 1998). All the expressions discussed in the paper denote functions of a certain type, and I use predicate logic and the lambda calculus as the metalanguage for representing their contributions to the truth conditions of a sentence. I use the variables x, y, z, p to denote arguments of type 'entity' (and for plural entity, the uppercase X, Z ... are used), the variables d to represent arguments of type 'degree', the variables P, Q to represent 1-place predicate, and the variables R to represent any 2-place predicate. For convenience, I sometimes use the informal $R(x,y)$ to represent $R(y)(x)$. Finally, I generally omit reference to contextual parameters in the denotations except where relevant.

b. *Each boy met an identical dog.

(6) (Internal reading intended)
   a. The boys met the same dog.
   b. The boys met {different dogs/equally big dogs/identical dogs}.

(7) a. John met {the same dog/a different dog/an equally big dog} as Mary did.
   b. *John met an identical dog as Mary did.

In a nutshell, this paper proposes a more fine-grained *equative* analysis of identity-based terms like *same*: *same*, which denotes an identity relation, must co-occur with an equative head. This move, motivated by the syntactic connection between identity-based terms and equatives, immediately captures its semantic properties, like how the internal reading is derived and the various licensing conditions for the internal reading.

The paper is organized as follows: Section 2 argues for the identity-based but not the similarity-based analysis for the semantics of English *same*, in light of the fact that only the former can capture its unique distribution as compared to typical adjectives. Section 3 presents an equative analysis of *same*, which can compositionally derive its external and internal readings in a uniform way. Section 4 shows how the current analysis, mediated by the economy principle, accounts for the different licensing conditions for the internal reading which a class of relational expressions such as *same*, *different*, *identical*, and equative phrases observe. Section 5 evaluates the previous studies and highlights the novel contribution of the current analysis. Section 6 offers a conclusion.

2 The identity-based semantics of *same*

This section argues that the semantics of English *same* is unambiguously identity-based and semantically contributes an indexical property, which is indicated by its unique distribution as compared to regular adjectives. I first review two approaches towards the semantics of *same* in the literature: the identity-based approach vs. the similarity-based approach, and argue that the existing evidence supports the former approach.

In the identity-based approach (Alrenga 2007b; Hanink 2017a, etc), *same* denotes the identity relation (8a). In the external use of *same* like (8), a referential index i introduced in the previous discourse saturates the first argument of *same* and yields an indexical property 'being $g(i)$'. Thus *the same dog* in (8) denotes 'the dog with the property of being the entity that the assignment function g assigns to the index i'.

(8) John met [a dog]$_i$. Mary met the same dog.
   a. $[\![\text{same}]\!] = \lambda y \lambda x . x = y$
   b. $[\![\text{Mary met the same dog}]\!] = met(m, \iota x[dog(x) \wedge x = g(i)])$

The similarity-based approach (Lasersohn 2000; Alrenga 2007a, 2010) by contrast, considers that *same* expresses contextual indistinguishability, where two entities are contextually indistinguishable if and only if they share all the properties in a contextually determined set C, as in (9a). Thus *the same dog* in (9) denotes 'the dog which has all the contextually-relevant properties that $g(i)$ has'.

(9) John met [a dog]$_i$. Mary met the same dog.
   a. $[\![\text{same}]\!] = \lambda y \lambda x . \forall P \in C[P(x) \leftrightarrow P(y)]$
   b. $[\![\text{Mary met the same dog}]\!] = met(m, \iota x[dog(x) \wedge \forall P \in C[P(x) \leftrightarrow P(g(i))]])$

Both can account for the weaker meaning of *same* in some cases, albeit by different means. For instance, (10) can still be true in a scenario where John and Mary met not exactly one and the same dog, but two dogs that are similar enough to each other. The identity-based approach argues that in this case the identity between types is involved (both types and tokens are type e entities in the model) and *the same dog* denotes 'the dog type with the property of being the previously-mentioned type', as in (10a). The similarity-based approach can derive the weaker meaning of (10) directly from the contextual variable C.

(10) John met [a dog]$_i$. Mary met the same dog.
   a. Identity-based analysis:
   $[\![\text{Mary met the same dog}]\!] = met(m, \iota x[dog_{type}(x) \wedge x = g(i)])$ [3]
   b. Similarity-based analysis:
   The context variable C in (9b) includes the relevant properties.

There is reason to believe that the identity-based analysis is superior to the similarity-based analysis.

First, *same* can only occur with the definite article but not the indefinite article. This falls under the identity-based analysis of *same*, which in essence contributes a semantically unique property: there is only one entity which can have the property of 'being s', which is s itself. As a result, the NP, after combining with *same*, will become a uniquely referring NP like *sun*; the definite article is thus required. The similarity-based analysis will wrongly predict that an indefinite article is possible, at least in certain cases, since 'having all the contextually-relevant properties that s has' is not semantically unique. For instance, when the contextual variable is set to properties concerning the personality of the dog, *same* could contribute to the property 'being honest and

[3]The potential semantic conflict between the token-level predicate *meet* and the type-denoting argument can be resolved by *Derived Kind Prediction* in Chierchia (1998):
(i) Derived Kind/Type Predication: If P does not apply to kinds/types and a is a kind/type, then $P(a) = \exists x[R(x,a) \& P(x)]$
(ii) $[\![\text{Mary met the same dog}]\!] = met(m, \iota x[dog_{type}(x) \wedge x = g(i)])$
$\rightarrow \exists z[R(x,z) \wedge met(m, \iota x[dog_{type}(x) \wedge x = g(i)])]$ (via the application of *Derived Kind Prediction*)

brave'. In this case, nothing should block the nominal combined with *same* to further co-occur with an indefinite article—certainly multiple dogs can have this property.

(11) John met [a dog]$_i$. Mary met {the/*a} same dog.

Second, *same* occupies a higher position than typical adjectives. It must occur above cardinals while the opposite holds for most adjectives, as shown in (12a-b).

(12) a. John met Fido and Lucky. Mary met {the same two dogs/*the two same dogs}.
b. John met Fido and Lucky. Mary met {*the identical two dogs/the two identical dogs.}

Interestingly, as Oxford (2010) notes, the pre-cardinal position is often occupied by another class of expressions *first*, *last*, and superlatives:

(13) a. The first two years would be hard for John.
b. The last three weeks would be busy for Mary.
c. The most important two months would be August and September.

All these expressions contribute to a semantically unique property: logically there can be only one first/last/most important thing or set of things, e.g. the first 'two years' are the first set of two years among all the sets of 'two years'. Similarly, 'the same two dogs' means the same set of two dogs: there is one set of dogs can have the property of 'being Fido and Lucky', which is the set containing Fido and Lucky (and no others). Again, the similarity-based analysis of *same* does not predict this distribution.

Finally, I revisit two arguments that are often taken to support the similarity-based analysis of *same*, and argue that they are not entirely solid. One is that the predicative *same* does seem not to have the strict identity meaning: the NP combines with it can have an indefinite interpretation:

(14) a. John met [a dog]$_i$. Mary met a dog that is the same.
b. Mary met three dogs that are the same.

However, I consider (14) to reveal more about the semantics of 'the same N_e' or 'be the same N_e' (where 'N_e' represents some kind of NP ellipsis), than about the semantics of *same* itself. Notice *same* by itself is not predicative in the first place:

(15) John met [a dog]$_i$. *The dog that Mary met is same.

(15) further supports that *same* belongs to the class of modifiers that contributes a semantically unique property, since *first, next*, and *most important* lack the predicative use either:

(16) *Those exams are {first/next/most important}.

The other argument is that since *same* can occur with scalar modifiers like *very*, or modifiers that are sensitive to scalarity like *almost* (Alrenga 2010, among others), its meaning cannot be identity-based:

(17) a. Mary met the {very/exact} same dog.
b. Mary met almost the same dog.

While it might be true that 'being *s*' is not a scalar property, the problem is that the co-occurrence with those modifiers does not guarantee the scalarity of *same*. English *very* and *exact* can readily modify apparently non-scalar terms like *dog*, as in (18). In addition, it is not clear whether *almost* in (17b) is modifying *same* directly or modifying the entire NP *the same dog* since *almost* actually can modify quantificational NPs like *everyone* or cardinal phrases, as in (18b) (Lee & Horn 1994, Amaral 2006). In short, taking (17) as evidence against the identity-based analysis of *same* is inconclusive.

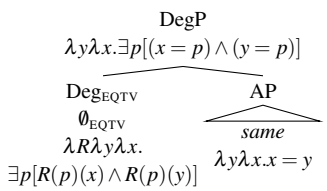
(18) a. Mary met this {very/exact} dog.
b. Mary met almost {everyone/fifty people}.

To sum up, the identity-based analysis of *same* is preferred to the similarity-based analysis based on the above discussion. In the next section, I propose a more fine-grained semantics of *same*, though in the end it still contributes an indexical property.

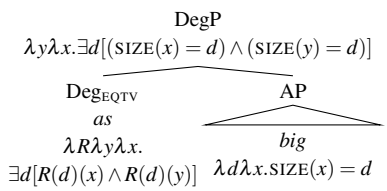
3 Analyzing *same* as equatives

This section proposes a novel mapping between the identity term *same* and equatives: they both involve an equative head and a relation. In particular, the relation in the first case is the identity relation denoted by *same*, while the relation for scalar equatives is a relation between degrees and entities, as shown below.

(19) a. Identity terms (e.g. *same*)



b. Equatives (e.g. *as big*)



I first outline my basic assumptions on gradable adjectives and scalar comparatives by analyzing scalar equatives like (20). Then I show that the equative analysis of *same* shown in (19a) not only captures its syntactic connection with equatives in its external use, cf. (20, 21), but more importantly compositionally derives the internal use of *same* like (22) by QR and parasitic scope of the equative head.

(20) a. John met [a dog]$_i$. Mary met an equally big dog.
b. Mary met {an equally big dog/as big a dog} as John (did).

(21) a. John met [a dog]$_i$. Mary met the same dog.
b. Mary met the same dog as John (did).

(22) a. The boys met the same dog.
b. Each boy met the same dog.

3.1 Basic assumptions on scalar equatives

I follow a well-established tradition in analyzing gradable adjectives as relations between degrees and individuals, which are of type $\langle d, et \rangle$ (Seuren 1973; Cresswell 1976, Hellan 1981, Heim 1985, Bierwisch 1989 among others). The gradable adjective *big*, for instance, denotes a relation between degrees of size d and objects x such that the size of x equals d.[4]

(23) $[\![\text{big}]\!] = \lambda d \lambda x.\text{SIZE}(x) = d$

I analyze the equative head as a 3-place predicate that takes a relation R and fixes one of its arguments to some parameter p, and returns a new relation that holds of two individuals x and y just in case the property 'being R to p' holds of them[5]. The semantics of equative heads like *as*, *equally* is given in (24):

(24) $[\![\text{as}_{\text{EQTV}}/\text{equally}]\!] = \lambda R_{\langle d,et \rangle} \lambda y \lambda x.\exists d[R(d)(x) \wedge R(d)(y)]$[6]

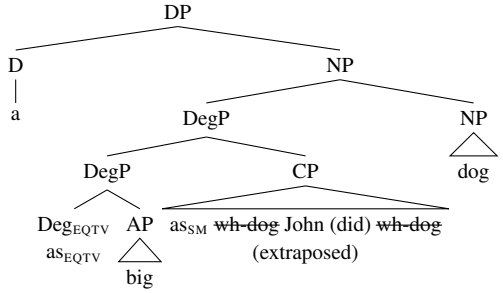
The syntax and semantics of the relevant parts of (25) is shown below: the comparative clause introduced by as_{SM} is an adjunct selected for by Deg (Kennedy 1999), which undergoes right extraposition (Matushanksy 2002). Semantically, the (partially elided) comparative clause denotes an individual like a free relative (Kennedy 1999, Oxford 2010; Charnavel 2015), as in (25a). The DegP ultimately denotes the property 'being as big as the dog that John met', as in (25b). This property combines with the predicate denoted by NP via Predicate Modification.

[4]The analysis of gradable adjective meanings in terms of an equality relation as in (23) is not the only option. Many analyses assume a partial ordering relation and the denotation of *big* would be '$\lambda d \lambda x.\text{SIZE}(x) \geq d$'. Here the decision to adopt the equality analysis is primarily for convenience, such that a more intuitive semantics of the equative head, as will be shown in (24), can be used for both scalar equatives and *same*. However nothing in my analysis particularly hinges on this choice – for instance, to adapt to the analysis based the partial ordering, I only need to modify the denotation of the equative head into '$\lambda R \lambda y \lambda x.\forall d[R(d)(y) \rightarrow R(d)(x)]$' accordingly.

[5]Here I adopt a 'phrasal' semantics for the degree head only for simplicity; another option is that the standard of comparison is an elided clause that directly denotes a degree (or a set of degrees); see Bresnan 1973; Chomsky 1977; Kennedy 1999; Heim 1985, 2006 for discussion. Again, a 'clausal' version of the current analysis is technically possible.

[6]To avoid potential confusion, the equative head *as* will be subscripted with EQTV (equative), while the *as* that introduces the standard of comparison will be subscripted as SM (standard marker).

(25) Mary met as_{EQTV} big a dog as_{SM} John (did).
LF:



a. $[\![\text{CP}]\!] = \iota x[met(j,x) \wedge dog(x)]$

b. $[\![\text{DegP}]\!] = [\![\text{as}_{\text{EQTV}}]\!]([\![\text{big}]\!])([\![\text{CP}]\!])$
$= \lambda x.\exists d[(\text{SIZE}(x) = d) \wedge (\text{SIZE}(\iota x[met(j,x) \wedge dog(x)]) = d)]$

We have analyzed scalar equatives where the standard is provided by an overt comparative clause. For sentences like (26), the standard is provided by a previously-mentioned discourse referent. In this case, the entity assigned to the index i by the assignment function g directly saturates the second argument of the equative head:[7]

(26) John met [a dog]$_i$. Mary met an equally big dog.
$[\![\text{equally big}]\!] = [\![\text{equally}]\!]([\![\text{big}]\!])(\text{g(i)})$
$= \lambda x.\exists d[(\text{SIZE}(x) = d) \wedge (\text{SIZE}(g(i)) = d)]$

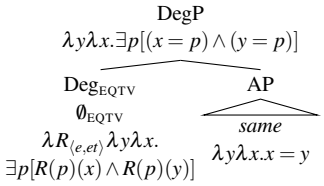
Now we are in a position to turn to *same*, which will be analyzed as a special case of equatives.

3.2 *Same* as equatives

This section proposes an equative analysis of *same*: *same* is always selected by a null equative head, as shown in (27). The null equative head, just like the equative head involved in scalar equatives, is a 3-place predicate that takes a relation R and fixes one of its arguments to some parameter p (here it is a type e object while in scalar equatives it is a type d object), and then returns a new relation that holds of two individuals just in case the property 'being R to p' holds of them.

(27) *same* as a case of equatives:

[7] There is a potential difference between the equative heads *equally* and *as*: the former allows the omission of the comparative clause or a comparative PP, while the latter does not, as in (i). This may reflect a syntactic constraint.
(i) John met John met [a dog]$_i$. *Mary met as big a dog.



Since R here is the identity relation denoted by *same*, the resulting meaning is a relation ($[\![\text{DegP}]\!]$) that holds between individuals x, y just in case there is some p such that $x = p$ and $y = p$, which will of course be the case only when $x = y$. In other words, the semantics of the DegP actually preserves the truth condition of the identity relation denoted by *same*, as in (28):

(28) a. $[\![\text{DegP}]\!] = \lambda y\lambda x.\exists p[(x=p)\wedge(y=p)]$
b. $[\![\text{same}]\!] = \lambda y\lambda x.x=y$

Importantly, this proposal leads to a uniform and compositional analysis for the external and internal uses of *same*, cf. (29, 30).

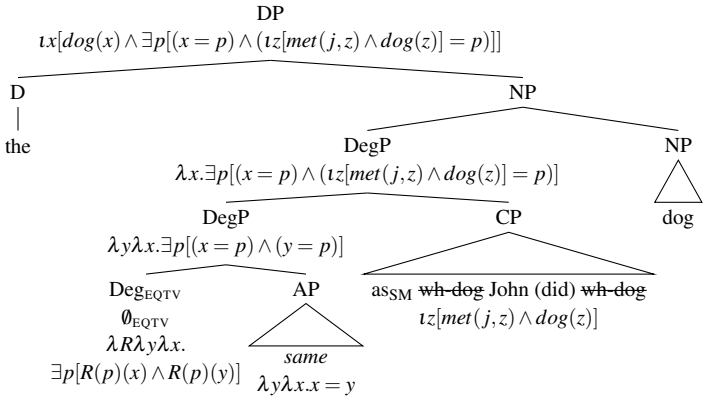
(29) External use of *same*:
a. Mary met the same dog as John (did).
b. John met [a dog]$_i$. Mary met the same dog.

(30) Internal use of *same*:
a. The boys met the same dog.
b. Each boy met the same dog.

3.2.1 The external reading of *same*

I first derive the semantics of (29a) in (31). It is exactly parallel to the scalar equatives that are discussed in Section 3.1. The equative head takes the identity relation as its first argument and the entity denoted by the comparative clause as its standard. The DegP ultimately contributes an indexical property 'being the dog which John met'. The ι-closure is forced, since the indexical property turns the NP it modifies into a uniquely referring nominal phrase. The NP 'the same dog as John (did)' denotes a unique dog with the property of 'being the dog that John met'.

(31) Mary met the same dog as$_{\text{SM}}$ John (did).



Since (29b) differs from (29a) only in how the standard of comparison is provided, I won't repeat the details of the derivation but give the semantics of the nominal phrase 'the same dog' in (29b) directly in (32):

(32) $[\![\text{the same dog}]\!] = \iota x[dog(x) \wedge \exists p[(x = p) \wedge (g(i) = p)]]$

3.2.2 The internal reading of *same*

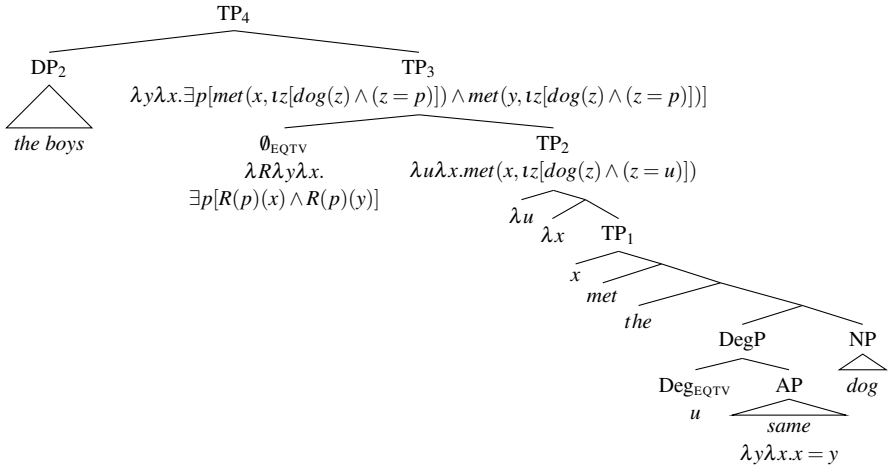
Assigning *same* a more fine-grained structure not only captures its syntactic resemblance with scalar equatives, but also derives the internal reading available in examples like (30) (repeated here as (33)) quite straightforwardly. When uttered out of blue, (33) have the so-called internal reading since the standard of comparison is provided by a semantically plural argument (i.e. the definite plural *the boys* in (33a) and the distributive quantifier *each boy* in (33b)) within the clause. In particular, the comparison is between every boy and the other boys in terms of the identity of the dog that they met.

(33) a. The boys met the same dog.
b. Each boy met the same dog.

I derive the internal reading in (33) via QR of the equative head, which is a scope-taking element. I first derive (33a) as in (34). There is parasitic scope (Barker 2007) such that both Deg° and the plural phrase in the sentence (e.g. *the boys*) are scoped out and the scope of the former is parasitic on that of the latter, as shown below.[8]

(34)

[8]See Barker (2007) which analyzes *same* as a scope-taking adjective without DegP structrue.



The relation created by QR ($[\![\text{TP}_2]\!]$) is a relation between an individual x and an entity u such that the dog which x met is exactly u. This relation saturates the first argument of equative head and yields a new relation ($[\![\text{TP}_3]\!]$) between individuals x and y such that the dog which x met is exactly the dog which y met.

The potential type mismatch between $[\![\text{TP}_3]\!]_{<e,et>}$ and $[\![\text{DP}_2]\!]_e$ triggers the application of *Hmg* (homogeneity, based on Beck 2000, 2001; Schwarzschild 1996). This operation freely transfers any symmetric relation R[9]into a property of a plural individual X such that R holds between all the atomic parts of X; see (35a). This operation is general in the grammar, which for instance is sometimes overtly realized as the prefix *a-* in English (35b):

(35) a. Operation *Hmg*: For any symmetric relation R, $R^{Hmg} = \lambda X.\forall x,y \leq X[R(y)(x)]$.
b. 'Darci is like Betty' → 'The girls are alike'.

Since $[\![\text{TP}_3]\!]$ is a symmetric relation, applying *Hmg* as in (36a) distributes this symmetric relation between all the atomic parts of the plural individual denoted by *the boys* (its denotation is informally represented as *the.boys*), deriving the internal reading as in (36b). (36b) can be roughly read as 'for every pair of boys x and y: the dog which x met is the dog which y also met'.

(36) a. $[\![\text{TP}_3]\!]^{Hmg} = \lambda X.\forall x,y \leq X[\exists p[met(x,\iota z[dog(z)\wedge(z=p)])\wedge met(y,\iota z[dog(z)\wedge(z=p)])]]$
b. $[\![\text{TP}_4]\!] = \forall x,y \leq the.boys[\exists p[met(x,\iota z[dog(z)\wedge(z=p)])\wedge met(y,\iota z[dog(z)\wedge(z=p)])]]$

For (33b), repeated here as (37), I follow Charnavel (2015) and Dotlačil (2010) in assuming that an implicit reciprocal *the others* exists. Adopting the classic analysis of the reciprocal *the others*

[9]The symmetric relation is defined as follows in this paper: If for any x and y, $R(y)(x) \leftrightarrow R(x)(y)$, then R is a symmetric relation.

(Heim, Lasnik & Mary 1991; Beck 2001; Dotlačil 2010), (37) has the underlying structure in (38), where *the boys* is co-indexed with the implicit pronoun in the reciprocal as its antecedent. [10]

(37) Each boy met the same dog.

(38) The boy_3 each met the same dog as the others (of Pro_3).

To make the derivation of (38) more explicit, I begin with the simpler sentence (39) to illustrate the LF and semantic derivation for the reciprocal.

(39) The boys_3 each saw the others (of Pro_3).
LF: [[the boys_3] each][1 [[t_1 the others (of Pro_3)][2 [t_1 $\text{saw}_{e,et}$ t_2]]]]

a. $[\![[[\text{ the boys}_3\text{] each]}]\!] = \lambda P.\forall y[y \leq the.boys_3(y) \rightarrow P(y)]$

b. $[\![\text{t}_1 \text{ the others (of Pro}_3\text{) }]\!] = \lambda Q.\forall z[z \neq x_1 \wedge z \leq x_3 \rightarrow Q(z)]$

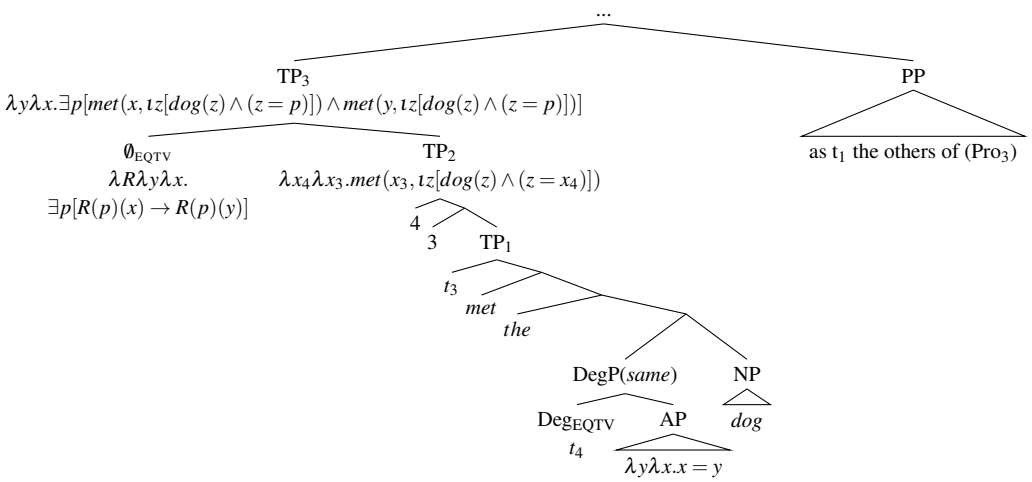
c. $[\![[\text{ 2 [t}_1 \text{ saw t}_2 \text{]] }]\!] = \lambda x_2.x_1 \text{ saw } x_2$

d. $[\![[\text{ 1 [[the others (of Pro}_3\text{)][2 [t}_1 \text{ saw t}_2 \text{]]]]}]\!] = \lambda x_1.\forall z[z \neq x_1 \wedge z \leq x_3 \rightarrow x_1 \text{ saw } z]$

e. $[\![[[\text{ the boys}_3\text{] each][1 [[the other (of Pro}_3\text{)][2 [t}_1 \text{ saw t}_2 \text{]]]]}]\!]$
$= \forall y[y \leq the.boys_3(y) \rightarrow \forall z[z \neq y \wedge z \leq x_3 \rightarrow y \text{ saw } z]]$

Our target sentence (38) is derived in a similar way: the 2-place predicate *saw* in (39) is replaced with the familiar 2-place relation derived via the QR and parasitic scope of Deg°, namely $[\![\text{TP}_3]\!]$ in (34), repeated here as in (40).

(40)



[10] While Charnavel (2015) does not specify what a reciprocal pronoun exactly is in her proposal, she seems to take it to be *each other*. However, as shown in Dotlačil (2010), *each other* and *each...the others* seem to involve two strategies of reciprocals and thus should be distinguished. Here I side with Dotlačil in assuming that the latter strategy is relevant here since (i) is ungrammatical compared to (ii). Note the analysis of reciprocals I adopt here is the right one for *the others*, as Dotlačil's demonstrates.

(i) *Each boy met the same dog as each other.
(ii) Each boy met the same dog as the others.

The full LF of (38) and its semantic derivation are shown in (41).

(41) LF: [[the boys$_3$] each][1 [[as t$_1$ the others (of Pro$_3$)][2 [t$_1$ [$_{\text{TP}_3}$ ...] t$_2$]]]]
where [$_{\text{TP}_3}$ ...] = [$_{\text{TP}_3}$ $\emptyset_{\text{EQTV}}$ [4 [3 [t$_3$ met the t$_4$-same dog]]]]

a. $[\![$the boys$_3$ each $]\!] = \lambda P.\forall y[y \leq \mathit{the.boys}_3(y) \rightarrow P(y)]$

b. $[\![$as t$_1$ the others (of Pro$_3$)$]\!] = \lambda Q.\forall z[z \neq x_1 \wedge z \leq x_3 \rightarrow Q(z)]$

c. $[\![\text{TP}_3]\!] = \lambda y \lambda x.\exists p[\mathit{met}(x, \iota z[\mathit{dog}(z) \wedge (z = p)]) \wedge \mathit{met}(y, \iota z[\mathit{dog}(z) \wedge (z = p)])]$
henceforth simplified as '$\lambda y \lambda x.x$ met the dog that y also met'.

d. $[\![$[2 [t$_1$ [$_{\text{TP}_3}$ ...] t$_2$]$]\!] = \lambda x_2.x_1$ met the dog that x_2 also met

e. $[\![$[1 [[as t$_1$ the others (of Pro$_3$)][2 [t$_1$ [$_{\text{TP}_3}$ ...] t$_2$]]]]$]\!]$
$= \lambda x_1.\forall z[z \neq x_1 \wedge z \leq x_3 \rightarrow x_1$ met the dog that z met]

f. $[\![$[[the boys$_3$ each][1 [[as the others (of Pro$_3$)][2 [t$_1$ [$_{\text{TP}_3}$ ...] t$_2$]]]]$]\!]$
$= \forall y[y \leq \mathit{the.boys}_3(y) \rightarrow \forall z[z \neq y \wedge z \leq x_3 \rightarrow y$ met the dog that z met]]

Crucially, only with the existence of Deg$^\circ$ (which is of a complex type) can the relation denoted by $[\![\text{TP}_3]\!]$ be derived and interact further with the reciprocal.

In sum, the internal reading of *same* available in (42) can be derived from QR and parasitic scope of the Deg$^\circ$ which co-occurs with *same*, together with the free *Hmg* operation readily available in the grammar.

(42) a. The boys met the same dog.
b. Each boy met the same dog.

3.3 Solving a puzzle

The current proposal derives the internal reading of *same* from the existence of a scope-taking Deg$^\circ$ (the equative head). The immediate prediction is that equative phrases like *equally big* should share the distribution in terms of the internal reading. While (43) does confirm the prediction, the impossibility of (44) for the internal reading seems to be problematic for the current proposal.

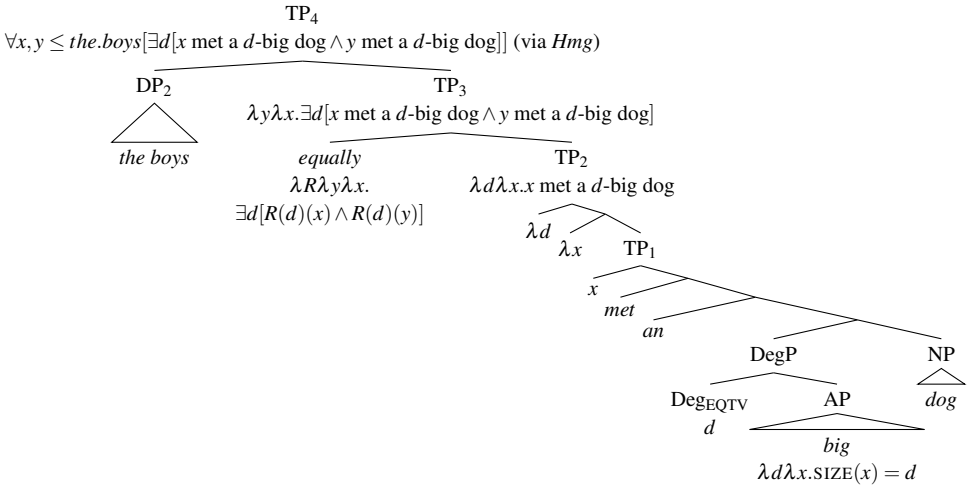
(43) a. Each boy met the same dog.
b. Each boy met an equally big dog.

(44) a. The boys met the same dog.
b. *The boys met {an/the} equally big dog.

In principle, (44b) should be possible since the equative head can be scoped out in exactly the same way as in (33), sketched here as in (45). Since the NP host[11] *dog* is inside the relation which saturates the first argument of *equally*, it can license a pair of eventualities 'x met a d-big dog' and

'y met a d-big dog' in the singular form. With the operation *Hmg* it can further license multiple pairs of eventualities for every pair of boys.

(45) The boys met an equally big dog.

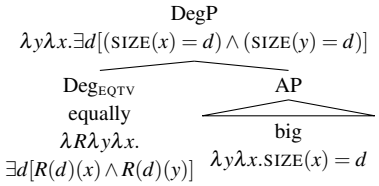


But why should (44b) lack the internal reading? I argue that it is blocked by the availability of a more economically derived alternative (46), which also has the internal reading:

(46) The boys met equally big dogs.

The way (46) derives its internal reading is to let the equative head stay in situ and apply the *Hmg* directly to the DegP, which by itself denotes a symmetric relation, as in (47). This derives the internal reading as a special case of the cumulative reading, following Beck (2000). The denotation of (46) is shown in (48), namely 'the boys met some dogs and those dogs are equally big to each other'[12]. Since *Hmg* applies at a lower position in (47) as compared to (45), it requires the NP host be plural, as the property denoted by DegP can only be held of plural entities (thus also called the *plural dependent* reading in Beck 2000). (40) also captures the long observed intuition about (46) such that it can have weaker readings and the internal reading is only a special case of it.

(47) Apply *Hmg* to DegP



$$[\![\text{DegP}]\!]^{Hmg} = \lambda X.\forall x, y \leq X[\exists d[(\text{SIZE}(x) = d) \wedge (\text{SIZE}(y) = d)]]$$

[11] I informally refer to the constituent that the DegP immediately modifies as 'the NP host' for convenience.

[12] The '*' and '**' in (48) are used to form predicates that are cumulative in the sense of Krifka (1992), with '*' applying to one-place predicates and '**' to two-place predicates.

(48) $[\![(46)]\!] = \exists X[^{**}met(the.boys, X) \wedge^{*} dog(X) \wedge \forall x, y \leq X[\exists d[(\textsc{size}(x) = d) \wedge (\textsc{size}(y) = d)]]]$

Now let us compare the two ways of deriving the internal reading: the first way is to apply *Hmg* after Deg$^{\circ}$ undergoes QR; the second is to apply only *Hmg*—clearly, the latter is more economical. Hence, the internal reading of (49a) is not available since this reading can be derived in a simpler way by the alternative in (49b).

(49) (Internal reading intended)
   a. *The boys met an equally big dog. (Blocked by (49b))
   b. The boys met equally big dogs.

However, the question arises as to why *same* only permits the less economical way of deriving the internal reading, unlike scalar equatives. Note that (50b) does not have the internal reading 'every one of the boys met the same dog as the other boys' since it can only mean 'every one of the boys met the same dog**s** as the other boys'. Adding the numeral as in (51) would sharpen the judgments: (51) can only be true when every boy met three dogs (e.g. Fido, Lucky, and Bella), but not when every boy met a dog (suppose there are three boys in total), and those three dogs are the same one or the same type. In other words, *Hmg* only applies after QR of Deg_{EQTV} to derive the internal reading of *same*. Why should this be the case?

(50) (Internal reading intended)
   a. The boys met the same dog.
   b. *The boys met the same dogs.

(51) The boys met the same (three) dogs.

The current proposal offers a simple answer: due to the semantics of *same* (i.e. identity), the application of *Hmg* to DegP (when the null equative head stays in situ), as in (52b), yields a property of a plural entity X such that for all atomic parts of X, those parts are one and the same atomic entity. This property is logically contradictory since the entity with this property cannot be a plural entity in the first place.

(52) a. $[\![[_{\text{DegP}}\ \emptyset_{\text{EQTV}}\ [_{\text{AP}}\ same\ ]\ ]]\!] = \lambda y \lambda x.\exists p[(y = p) \wedge (x = p)]$
   b. $[\![[_{\text{DegP}}\ \emptyset_{\text{EQTV}}\ [_{\text{AP}}\ same\ ]\ ]]\!]^{Hmg} = \lambda X.\forall x, y \leq X[\exists p[(y = p) \wedge (x = p)]]$ (logically contradictory)

To sum up, this section proposed three strategies for the internal reading: (i) distributive quantifiers like *each boy* license the internal reading of *same* and equative phrases (i.e. *equally big*) via QR of Deg$^{\circ}$ and the implicit reciprocal *the others*; (ii) definite plurals like *the boys* licenses the internal reading of *same* via QR of Deg$^{\circ}$ and the operation *Hmg*; (iii) definite plurals like *the boys* licenses the internal reading of equative phrases via only the operation *Hmg*. For the first two strategies, the NP host can be singular due to QR of Deg$^{\circ}$; for the third strategy, the NP host must be plural since *Hmg* directly applies to the DegP.

3.4 Interim summary

This section proposed a novel mapping between *same* and equatives: *same*, by itself denoting an identity relation, must co-occur with a null equative head. The analysis not only captures the syntactic connection between *same* and equatives, but also derives the external and internal uses of *same* compositionally in a uniform way. I also argued that for different licensors of the internal reading like *each boy* and *the boys*, different strategies of deriving the internal reading are involved.

Pursuing the line of reasoning sketched briefly in Section 3.3, I address the broader issue of why a class of relational expressions such as *same, different, similar, identical*, and equative phrases differ in their ways of licensing the internal reading (Dotlačil 2010, Brasoveanu 2011, Brasoveanu & Dotlačil 2012) in the next section.

4 Licensing the internal reading

4.1 The puzzle revisited

This section revisits the different licensing conditions for the internal reading for a class of relational expressions in English, representative of which are *same, different, similar, identical*, and equative phrases (Dotlačil 2010; Brasoveanu 2011; Brasoveanu & Dotlačil 2012; Charnavel 2015). The puzzle is sketched as follows: (i) distributive quantifiers like *each boy* can license the internal reading of *same*, *different*, and equative phrases when their NP host is singular (but not plural[13]), but cannot license the internal reading of *similar* and *identical*, cf. (53); (ii) definite plurals like *the boys* can license the internal reading of *same* when its NP host is singular but can license the internal reading of the rest of the lexical items in this class only when their NP host is plural, cf. (54).

(53) (Internal reading intended)
   a. Each boy met {the same dog/*the same dogs}.
   b. Each boy met {a different dog/*different dogs}.
   c. Each boy met {an equally big dog/*equally big dogs}.
   d. Each boy met {?*a similar dog/*similar dogs}.[14]
   e. Each boy met {*an identical dog/*identical dogs}.

(54) (Internal reading intended)
   a. The boys met {the same dog/*the same dogs}.

[13]This is not to say that 'each boy met the same dogs' is impossible for any internal reading—the intended internal reading throughout this section is 'each boy met one dog and those dogs are the same one'. When the NP host is plural, it requires each boy to meet at least two dogs, which makes the NP host still 'singular' in our sense here.

b. The boys met {*a different dog/different dogs}.

c. The boys met {*an equally big dog/equally big dogs}.

d. The boys met {*a similar dog/similar dogs}.

e. The boys met {*an identical dog/identical dogs}.

The goal here is to account for (53-54) with the assumptions and operations which have been proposed so far. Let us first review what has been achieved in Section 3 and then determine whether the rest of the puzzle can be resolved by the current proposal.

In Section 3, I argued that for different licensors like *each boy* and *the boys*, different strategies are involved. In particular, *each boy* licenses the internal reading of X (where X is a member in the class of relational expressions discussed here) via QR of Deg$^\circ$ and the implicit reciprocal *the others* (STRATEGY A henceforth):

(55) Each boy met {the/a} X dog (as the others).

Since the NP host would be inside the relation created by QR and parasitic scope of Deg$^\circ$, it must be singular for the internal reading where every boy met one dog and those dogs are X. Thus all the cases in (53) where the NP host is plural are expected to be impossible for the internal reading. For the rest, the current proposal makes the following prediction: *each boy* can license the internal reading of X if X makes a Deg$^\circ$ available, which can be scoped out (Prediction 1).

For licensors like *the boys*, I argued that two strategies are possible: (i) apply *Hmg* only (STRATEGY B); (ii) apply *Hmg* after QR of Deg$^\circ$ (STRATEGY C). Moreover, STRATEGY B is generally preferred to STRATEGY C unless the former is impossible for independent reasons. This accounts for (54a) and (54c), as discussed in Section 3.3. For the rest, the current proposal makes the following prediction: *the boys* can license the internal reading of X as long as X can make a symmetric relation available for *Hmg* to apply to (Prediction 2).

Now let us examine the two predictions. Since *different* uses the standard marker of comparative (i.e. *than*) and can take a (partially elided) comparative clause, I assume that *different* also co-occurs with a Deg head, just like *same*. In particular, this Deg$^\circ$ should be an inequative head, as its standard marker *than* indicates. It is not surprising that inequative head shares the standard marker with *more* and *less* since according to the categorization in Oxford (2010), those three heads fall under a larger class – 'non-equative' Deg heads.

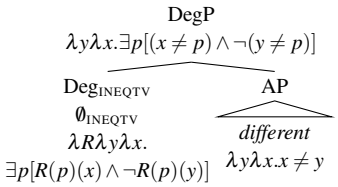
(56) a. John met a different dog than Mary (did).

[14]There is variation in judgments for *similar*: some speakers consider *similar* (with singular NP host) to sound better than *identical* (with singular NP host), though degraded compared to identity terms, as reported in Brasoveanu & Dotlačil (2012).

b. John met a {bigger/less big} dog than Mary (did).

The structure and semantics of *different* is shown in (57):[15]

(57) Non-identity terms (e.g. *different*)

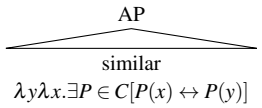


For *similar* and *identical*, they do not exhibit typical comparative syntax: they use the non-comparative linker *to*, and may not take a (partially elided) comparative clause:

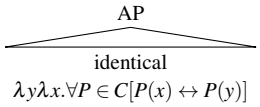
(58) a. John met a {similar/identical} dog to Mary's dog.
b. *John met a {similar/identical} dog as Mary (did).

Thus I analyze them as regular relational terms that do not co-occur with Deg°:

(59) a.



b.



Now for Prediction 1, since *different* involves the existence of a scope-taking Deg° while *similar* and *identical* do not, we expect only the former have the internal reading with *each boy*. This is confirmed in (53), repeated here as in (60).

(60) (Internal reading intended)
a. Each boy met a different dog.
b. *Each boy met a similar dog.
c. *Each boy met an identical dog.

As for Prediction 2, since the expressions *different*, *similar*, *identical* are all relational terms, we expect them to have the internal reading with *the boys*. Since applying *Hmg* to these expressions (STRATEGY B) does not yield any logical contradiction, as in (61), we further expect the NP host to be plural. This is also confirmed in (54), repeated here in (62).

(61) a. $[\![[\emptyset_{\text{EQTV}}\ \text{different}]]\!]^{Hmg} = \lambda X.\forall x, y \leq X[\exists p[(x \neq p) \wedge \neg(y \neq p)]]$

[15] For now I assume that at least one interpretation of the lexical item *different* is identity-based. In Section 4.2 I will show that it is ambiguous between non-identity and dissimilarity meanings.

b. $[\![\text{similar}]\!]^{Hmg} = \lambda X.\forall x, y \leq X[\exists P \in C[P(x) \leftrightarrow P(y)]]$

c. $[\![\text{identical}]\!]^{Hmg} = \lambda X.\forall x, y \leq X[\forall P \in C[P(x) \leftrightarrow P(y)]]$

(62) (Internal reading intended)

a. The boys met different dogs.

b. The boys met similar dogs.

c. The boys met identical dogs.

In sum, the various licensing conditions for the internal reading for a class of relational expressions as in (53-54) can be explained under the current proposal.

4.2 Further predictions

While there are various conceivable ways of accounting for the distribution in (53-54) (Dotlačil 2010; Brasoveanu 2011; Charnavel 2015; see a detailed comparison in Section 5), the current analysis has the advantage of capturing inter-speaker and crosslinguistic variations. Accordingly, while the judgments of *similar* vary, we predict those who accept (63a) should also accept (63b), which seems to be the case.

(63) a. (?)Each boy met a similar dog. (Internal reading intended)

b. (?)Mary met a similar dog as John did.

Another prediction is that since (64a) is blocked by (64b) based on the economy principle, we expect the strength of the blocking effect to vary from language to language. Indeed, while (64a) is impossible for English and German (Beck 2000) when an internal reading is intended, its counterparts in Czech, Dutch and French, as reported in Dotlačil (2010: 220) and reduplicated here as in (65-66), are indeed fine for the internal reading, though slightly degraded. Crucially we expect no language to allow (64a) but not (64b).

(64) Internal reading intended:

a. *The boys met a different dog.

b. The boys met different dogs.

(65) Czech

a. Pavel a Honza na tohle mají různý názor
Pavel and Honza on this have different opinion$_{SG}$

b. Pavel a Honza mají různá auta
Pavel and Honza have different cars

(66) Dutch

a. De steden in het noorden hebben een verschillende lengte-eenheid.
the towns in the north have a different length-unit

b. Jan, Kees en Wim hebben verschillende schilderijen gekozen
Jan, Kees and Wim have different pictures chosen

A third prediction is that if a language does have (67a) for the internal reading, it should also allow (67b) to have the internal reading. If it is indeed the case, it will be a strong support for the proposed analysis. Given the limited scope of the paper, I will leave this matter open for further research.

(67) a. The boys met a different dog.
b. The boys met an equally big dog.

4.3 More on *different*

In the previous section, English *different* was treated as expressing non-identity. Strictly speaking, this is not entirely correct since the previous literature (Alrenga 2010 among others) generally considers it to also have the dissimilarity meaning, indicated by a class of possible modifiers for *different*:

(68) John met a dog. Mary met a(n) (slightly/extremely/completely) different dog.

The intuition is that in the presence of the modifiers in (68), the relevant meaning of *different* involves dissimilarity, where the properties of one entity are compared to the properties of the other such that they differ in the values of at least one property. The more properties they differ from each other, the higher the degree of the dissimilarity is. Although I will not attempt a formal analysis of the meaning of *different* here, I will report a few observations which may be of interest.

It has been observed that English *different* can use either the comparative linker *than* or the non-comparative linker *from* to introduce one of its arguments (Oxford 2010):

(69) a. John met a different dog than Mary did.
b. John met a different dog from the dog which Mary met.

Interestingly, when *different* is modified by adverbs that usually occur only with scalar terms, native speakers report a preference for *from* over *than*:

(70) a. ??John met a(n) (slightly/extremely/completely) different dog than Mary did.
b. John met a(n) (slightly/extremely/completely) different dog from the dog which Mary met.

This leads to the preliminary hypothesis that there are two *different*'s in English: one expresses non-identity, and it co-occurs with Deg$^{\circ}$ (an inequative head); the other expresses dissimilarity, which does not co-occur with the inequative head. While the former can use the comparative

linker *than* and take a comparative clause as its argument, the latter uses the non-comparative linker *from* and cannot take a comparative clause as its argument.

Since the current proposal attributes the following use of *different* in (71) to the existence of an inequative head, we further expect the internal reading to be degraded when modifiers that force a dissimilarity reading occur. This seems to be the case:

(71) (Internal reading intended)
   a. Each boy met a different dog.
   b. ??Each boy met a(n) (slightly/extremely/completely) different dog.

4.4 Interim summary

In sum, this section extends the current proposal to a broader class of relational expressions, including *same, different, similar, identical*, and equative phrases, which accounts for the heterogeneity within the class in the licensing of the internal reading.

5 Previous literature

In light of the numerous studies on *same*, a comprehensive review will not be offered. Instead, I focus on studies which (i) explicitly analyze *same* as comparatives (Alrenga 2006, 2007a; Oxford 2010; Charnavel 2015; Hanink 2017a)[16]; and (ii) explore how the external and internal readings of *same* are related (Dowty 1985, Carlson 1987, Barker 2007; Brasoveanu 2011; Dotlačil 2010; Charnavel 2015). Compared to these previous studies, the current proposal provides a more fine-grained mapping between *same* and scalar equatives, and also extend their syntactic resemblance to derive the external and internal readings of *same* in a uniform way, which has not so far been attempted.

Alrenga (2006, 2007a, et seq.) treats sentences with *same* like (72b) as similarity comparatives which measure the dissimilarity between the target and the standard along all the relevant dimensions. In his analysis *same* and the scalar equative head are parallel in that both measure the difference between two sets, cf.(73). The scalar equative head *as* is a degree quantifier which takes two sets of degrees and asserts that there is no difference between them. As for *same*, it is an 'unsaturated' version of the scalar equative head such that it contains an open variable $R_{\langle dt,et\rangle}$ in its denotation, where R introduces the dimensions of comparison for similarity comparatives, just as *tall* in (72a) introduces the spatial extent dimension.

[16]There are many other studies which indicate the connection between *same* and comparatives (Heim 1985; Beck 2000; Matushansky 2010 among others), however I will not go through them here since most of their ideas have been spelled out more explicitly in the recent studies that I will review here.

(72) a. John is as tall as Mary.
b. John is the same as Mary.

(73) a. $[\![as]\!] = \lambda I_{dt} \lambda J_{dt} . J - I \cup I - J = \varnothing$
b. $[\![same]\!] = \lambda P_{\langle\langle dt,et\rangle,dt\rangle} \lambda Q_{\langle\langle dt,et\rangle,dt\rangle} . P(R) - Q(R) \cup Q(R) - P(R) = \varnothing$

Alrenga's analysis is the first one to provide an explicit mapping between scalar equatives and *same*. However, he only examines the predicative *same* and as shown in Section 2, *same* by itself is not predicative. Thus his proposal offers an analysis of *(be) the same* rather than *same*. Since the prenominal *same* discussed in this paper differs from *(be) the same* in various aspects, Alrenga's similarity-based analysis does not invalidate the proposed identity-based semantics for *same*. Moreover, the internal reading of *same* is not discussed in his work.

Charnavel (2015) treats *sidi* items (e.g. *same* and *different*, *other*, etc) as semantically relational terms that can syntactically select either DP or CP (partially or fully elided) as one of its arguments. When the standard is provided by CP, it involves movement of a *wh*-operator as in (74b-c). Her proposal is attractive in that it offers a uniform analysis of the external and internal readings of *sidi* terms: with silent structures in (74), *X* can be interpreted as a pronoun (anaphoric to the previously-mentioned discourse referent *i*), which yields the external reading, as in (74a); or to be interpreted as a reciprocal, which yields the internal reading, as in (74c).

(74) a. Mary drives [a Honda]$_i$. John drives the same car ~~as~~ X$_{pronoun}$.
b. John drives the same car as [$_{CP}$ ~~wh car~~ Mary ~~drives wh car~~].
c. The boys drive the same car ~~as~~ [$_{CP}$ ~~wh car~~ X$_{reciprocal}$ ~~drives wh car~~].

While the current proposal follows Charnavel (2015) to posit the syntax of comparatives for *same* and *different*, two points are worth noting. First, Charnavel does not give an explicit semantics of the 'reciprocal' in her analysis, and the internal readings with different licensors, cf. (75), are not distinguished.

(75) a. The boys drive the same car ~~as~~ [$_{CP}$ ~~wh car~~ X$_{reciprocal}$ ~~drives wh car~~].
b. Each boy drives the same car ~~as~~ [$_{CP}$ ~~wh car~~ X$_{reciprocal}$ ~~drives wh car~~].

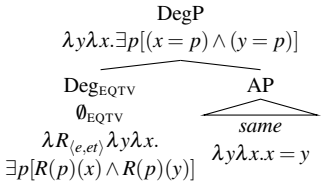
However, the implicit reciprocals in (75a) and (75b) cannot be the same, as Dotlačil (2010) demonstrates with (76). The current proposal captures the distinction by deriving the internal reading in (76a) and (76b) via different strategies: the former is derived via QR of Deg$^\circ$ and the implicit *the others* (DA-approach in Dotlačil 2010); the latter is derived via QR of Deg$^\circ$ and the operation *Hmg* (R-approach in Dotlačil 2010).

(76) a. Each boy met the same dog as {*each other/the others}.
b. The boys met the same dog as {each other/*the others}.

Second, while Charnavel analyzes *same* (in French) as expressing a maximal similarity relation, as in (77), *same* in the current proposal denotes an identity relation and must co-occur with an equative head (of a complex type), as in (78).

(77) $[\![same]\!] = \lambda y \lambda x . \forall P \in C[P(x) = P(y)]$ (C is a set of contextually relevant properties, preferably including all possible properties)

(78) *same* as a case of equatives:



In comparison, the current proposal is identity-based, and is preferred for the reasons given in Section 2. Moreover, (78) makes a closer parallel between *same* and scalar equatives possible, hence the fact that *same* uses exactly the same standard marker in equatives falls out straightforwardly.

Oxford (2010) and Hanink (2017b) treat *same* as an equative head which denotes an identity relation ($\lambda y \lambda x . x = y$). However, they focus on the syntactic aspects of *same* and do not discuss how the internal reading is derived.

Barker (2007) provides the first compositional analysis for the internal reading of *same*. He analyzes *same* as a scope-taking adjective (of the complex type (79a)) which can take parasite scope over some other scope-taking element, e.g. a plural phrase or universal quantifier phrase. His analysis is illustrated in (81) with example (80).

(79) a. type(*same*) = type (q(Adj, N, N)) = $<< Adj', N' >, N' >$
b. $[\![same]\!] = \lambda F_{<\text{Adj,N}>} \lambda X_e . \exists f_{\text{choice}} \forall x < X : F(f)(x)$

(80) Ann and Bill read the same book. (internal reading)

(81) [Ann and Bill [same [2 [1 [t_1 read the t_2 book]]]]]
a. $[\![$[2 [1 [t_1 read the t_2 book]]]]$]\!] = \lambda f_2 \lambda x_1 . read(x_1, (\iota z[z = f_2(book)]))$
b. $[\![$[same [2 [1 [t_1 read the t_2 book]]]]]$]\!] = \lambda X . \exists f_{\text{choice}} \forall x < X : read(x, (\iota z[z = f(book)]))$
c. $[\![(80)]\!] = \exists f_{\text{choice}} \forall x < a \oplus b : read(x, (\iota z[z = f(book)]))$

The current analysis follows Barker (2007) which derives the internal reading of *same* via QR and parasitic scope of a scope-taking element. However, by attributing the scope-taking ability to the equative head that selects *same*, the current proposal has the further advantage of capturing the syntactic resemblance between *same* and equatives, as well as unifying the semantics for external

and internal *same*.

Brasoveanu (2011) proposes a unified account for the external and internal readings of singular *different* within a stack-based dynamic system and distinguishes between singular *different*, plural *different*, and *same* in terms of their licensors for the internal reading. The current proposal instead relates the internal reading of *same* and *different* to the existence of Deg°, which can take scope. The singular *different* and plural *different* are the results of the application of different strategies: applying QR of Deg° enables the singular NP host of *different* to license multiple eventualities (STRATEGY A and STRATEGY C); while applying *Hmg* when Deg° is in situ requires the NP host of *different* to be plural (STRATEGY B). As for *same*, QR of Deg° is obligatory to license its internal reading since STRATEGY B is blocked for independent reasons. While both proposals can cover a range of empirical data, the current proposal has the advantage of capturing the (partially) shared distributions between *same*, *different*, and scalar comparatives, which is not directly shown in a dynamic account. Moreover, the current proposal potentially captures the inter-speaker and cross-linguistic variations dicussed in Section 4.2.

Finally, I will go through the novel observations on *same*, recently reported in Hardt & Mikkelsen (2015) and show that the current proposal can potentially extend to capture them. Hardt & Mikkelsen argue that the contrasts in (82-84) are unexpected if the semantics of *same* expresses the identity between entities as Brasoveanu (2011) claims. Unlike anaphoric devices such as *it*, *same* seems to compare eventualities and require them to be *parallel*: (82a) is bad since the antecedent eventuality is under negation thus not accessible; (83a) is bad since the two eventualities 'praising' and 'reading' are not parallel; (84a) is bad since only one eventuality is available in the discourse and thus no comparison between eventualities is possible.

(82) John didn't read War and Peace. (Negated Antecedent)
   a. *but Susan read the same book.
   b. but Susan read it.

(83) John praised War and Peace. (Parallel Antecedent)
   a. *And Bill read the same book.
   b. And Bill read it.

(84) John caught a big fish, (Distinct Antecedent)
   a. *and he caught the same fish without any fishing equipment.
   b. and he caught it without any fishing equipment.

While I basically agree with their claim that there is more to *same* than simply an anaphoric device, it is not clear if *same* must compare eventualities; instead, it may have to do with a more general

fact about comparatives and discourse coherence. For instance, use of the scalar equative in these cases is also odd, as shown below.

(85) a. John didn't read War and Peace. *Susan read an equally long book.
b. John praised War and Peace. *Susan read an equally book.
c. John caught a big fish, *and he caught the equally long fish without any fishing equipment.

Since the current proposal treats *same* as a kind of equative, (82-84) can be explained under the more general constraints of pragmatics without complicating the basic meaning of *same*.

6 Conclusions

This paper spells out the long-observed connection between *same* and scalar equatives in a novel way: *same* denotes the identity relation and it must co-occur with an equative head, which makes it parallel to scalar equatives. This proposal not only captures the syntactic resemblance between *same* and scalar equatives, but also derives the internal and external readings of *same* in a unified way: in particular, the internal reading of *same* is derived via QR and parasitic scope of Deg$^\circ$. The current proposal also easily extends to *different*, which has the syntax of comparatives as well. The long observed contrast between equative phrases, *same*, *different*, and relational adjectives which do not exhibit comparative syntax like *identical* in terms of their licensing conditions for the internal reading receives a simple answer under this analysis: only those with a scope-taking Deg$^\circ$ can derive the internal reading when their NP host is singular; and any of them which denotes a symmetric relation (excerpt for the identity relation) can derive the internal reading when their NP host is plural.

Apart from capturing a considerable range of empirical data, the proposed mapping between *same* and scalar equatives also has implications on the nature of the equative head. Recent studies (Rett 2013; Anderson & Morzycki 2015 among others) have shown that comparative heads, especially equative heads, often occur even when no degrees are involved. The semantics of the equative head proposed in this paper indicates that the relation which the equative head (3-place predicate) takes may be of a flexible type: either relations between entities and degrees (type $\langle d, et \rangle$), or relations between entities (type $\langle e, et \rangle$).

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