Correlatives

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Abstract

The paper reviews the semantics and pragmatics of correlatives across various ontological domains (temporal, modal, individual and degree domains), focusing mostly on Indo-European languages. Taking correlatives in the individual domain as a case study, the paper then argues that their interpretation, in particular the variability of the uniqueness effects exhibited by correlatives, is due to their mixed referential and quantificational nature. The account involves an articulated notion of quantification consisting of both (discourse) referential components and non-referential/quantificational components – thus bringing together previous analyses that took either the referential or the quantificational route. The variable uniqueness effects emerge out of the interaction between (*i*) the semantics of wh-indefinites, singular anaphors and habitual morphology and (*ii*) the pragmatics of quantification, which allows for the selection of different levels of 'zoom-in' on the quantified-over objects.

1 Correlatives Across Domains

This paper focuses on the semantics and pragmatics of correlatives. Our working definition is that correlatives are "biclausal topic-comment structures [...] [in which] the dependent clause introduces one or more topical referents to be commented on by the matrix clause, where each topical referent must be picked up by – correlated with – an anaphoric proform." (Bittner 2001:39).

1.1 Correlatives in the Temporal Domain: *When*-clauses

Consider, for example, correlative structures in the temporal domain, exemplified in English by *when*-clauses. "A *when*-clause behaves rather like one of those phrases that are used to explicitly change topic [...] [it] does not require a previously established temporal focus, but rather brings into focus a novel temporal referent." (Moens & Steedman 1988:22-23)

This novel temporal focus can have a referential, definite interpretation, as in (1) (from Moens & Steedman 1988) and (2) (from Partee 1984) below, or it can be quantificationally interpreted, as in (3) and (4).

(1) When they built the 39^{th} Street bridge {a local architect drew up the plans / they used the best materials / they solved most of their traffic problems}.

(2) When the Smiths threw a party, they invited all their friends.

(3) Back in New Orleans, when the Smiths threw a party, they invited all their friends.

(4) When the Smiths throw a party, they invite all their friends.

Other examples of quantificational *when*(-based) clauses from Partee (1984) are provided below.

(5) When Mary telephoned, Sam was always asleep.

(6) When John makes a phone call, he always lights up a cigarette beforehand.

(7) Whenever Mary telephoned, Sam was asleep.

(8) Whenever Mary wrote a letter, Sam answered it two days later.

(9) Whenever John got a letter, he answered it immediately.

(10) Whenever Mary telephoned on a Friday, Sam was asleep.

(11) If Mary telephoned on a Friday, it was (always) Peter that answered.

The availability of both definite/referential and quantificational interpretations raises the question: how can we put together the topic-comment characterization of referentially-interpreted *when*-clauses and the availability of quantificational interpretations for such clauses? This question comes into even sharper focus when we examine correlatives in other ontological domains.

1.2 Correlatives in the Modal Domain: Conditionals

"[E]xplicit *if*-clauses may introduce some hypothetical scenario by definite reference, just as *when*-clauses introduce a time. Such hypotheses may be recovered for modals, within and across sentences, as shown by [(12)] (from the Brown Corpus)." (Stone 1997:6)

(12) New York Central Railroad president Alfred E. Perlman said Tuesday his line WOULD face the threat of bankruptcy IF the Chesapeake & Ohio and Baltimore & Ohio Railroads merge. Perlman said bankruptcy WOULD not be an immediate effect of the merger, but COULD possibly be an ultimate effect. (Stone 1997)

Just as *when*-clauses, *if*-conditionals can also be interpreted quantificationally and not only referentially: "[there are] cases where multiple instantiations of the conditional are clearly intended – for example, in any conditional interpreted generically. [...] A simple illustration is provided by [(13)] [where] the scenarios evoked by the antecedent and described in the consequent vary across many different concertgoers. A more complicated illustration is given in [(14)]. Here the antecedent contains a constituent *if*-clause, *if an enemy captures it*, that varies across submarines much like the *if*-clause in [(13)] varies across concertgoers. At the same time, the modal *will* in the consequent describes a scenario that includes this capture of the submarine. So the interpretation of the consequent varies with the interpretation of a subconstituent of the antecedent (and not simply with the interpretation of the antecedent as a whole). Because of this, the sentence may be regarded as a exemplifying an analogue of donkey anaphora for modals." (Stone 1997:6-7)

(13) If a concertgoer arrives late, he or she will not be permitted into the auditorium until intermission. (Stone 1997)

(14) If a submarine cannot self-destruct if an enemy captures it, the enemy will learn its secrets. (Stone 1997)

The non-referential, non-definite interpretation of modal anaphora is also illustrated by modal subordination: the modal *might* in example (15) below (based on Roberts 1989) introduces a new hypothetical scenario featuring a wolf coming in – and the second sentences further elaborates on this hypothetical scenario and the characters/entities featuring in it.

(15) A wolf might walk into the house. It would eat you.

The referential, definite interpretation of the modal anaphora in (12) above contrasts with the non-referential interpretation of discourse (15), which as a whole receives the following quantificational interpretation: for *any* possible scenario featuring a wolf that walks into the house (whether the wolf is big or small, male or female, black or grey etc.), the wolf eats you. Thus, the first sentence in (15) introduces a quantificational dependency between possibilities (possible scenarios) and individuals (the individuals featuring in those scenarios) and the second sentence in (15) elaborates on this dependency. In fact, we can use *if*-clauses to further elaborate on such quantificational modal dependencies, as shown by the two examples below from Stone (1997):

(16) A wolf might walk in. If you hid from it, it would not eat you.

(17) A wolf may come in. It will eat you. If it enjoys you, it will eat someone else. Luckily, [I think] it will dislike the experience: had it enjoyed you, it would have eaten someone else.

The idea that conditionals are correlative structures in the modal domain receives further support from Warlpiri, where correlative structures are ambiguous between a modal and an individual level interpretation, as Bittner (2001) notes with respect to example (18) below.

(18) Maliki-rli kaji-ngki yarlki-rni nyuntu ngula-ju kapi-rna luwa-rni
dog-ERG SAME.TOPIC-3SG.2SG bite-NONPAST you DEM-TOP FUT-1SG.3SG shoot-NONPAST
ngajulu-rlu.
me-ERG

A. 'As for **the** dog that bites you, I'll shoot **it**.' (individual-based)
B. '**If** a dog bites you, **then** I'll shoot it.' (modal-based)

"The dependent clause of [(18)] – with the complementizer *kaji* [...] – introduces a topical referent of some type. On reading [(18A)] the topic is a contextually prominent individual, and on reading [(18B)], a prominent possibility. In either case, the topical referent is picked up in the matrix comment by a topic oriented anaphoric demonstrative *ngula-ju*, which is likewise type-neutral. So depending on the context, the topic of [(18)] may be either the most prominent dog which bites the addressee or the closest possibility that a dog may bite. The correlated comment is that the speaker will shoot the topical dog, or that in every world of the topical possibility the speaker will shoot whatever dog bites there. The fact that one and the same sentence can have both of these readings suggests that they have essentially the same semantic representation, up to logical type." (Bittner 2001:39)

A compositional semantics for English conditionals that captures their correlative-like characteristics, i.e., the fact that they have a topic-comment structure and involve reference to and quantification over possibilities and over individuals quantificationally dependent on those possibilities, is formally spelled out in Brasoveanu (2010).

1.3 Correlatives in the Individual Domain

In contrast to Warlpiri, the Marathi correlative morphology is sensitive to type – as shown by the *j* (*wh*-items)/*t*(*th*-items, i.e., demonstratives) paradigm in (19) below, from Andrews (1975:98 et seqq). Examples of Marathi correlatives across several ontological domains (also from Andrews 1975) are provided below.

(19)

ǰa 'which'	ǰevha 'when'	ǰithe 'where'	jər 'if'	jəri 'although'
tya 'that'	tevha 'then'	tithe 'there'	tər 'then'	təri 'even so'

(20) ǰa mula-ni ǰa muli-ca dueš kela, tya-ni ti-la marli.
which boy-INST which girl-GEN hatred did, DEM.M-INST DEM.F-DAT killed
'The boy who hated the girl killed her.'

(21) mĩ ǰevha alo, tevha to joplela hota.
I.INST when came, then he sleeping was
'When I arrived, he was sleeping.'

(22) ǰithe sawəli hoti, tithe Ram bəsla.
where shade was, there Ram sat down
'Where there was shade, Ram sat down.'

(23) jər to ithə yel, tər mi tya-la goḷi marin.
if he here comes, then I.INST he-DA bullet kill.FUT
'If he comes here, then I'll kill him.'

(24) jəri tya-ni majha kutrya-la marlə, təri mə-la to awərṭo.
although he-INST me.GEN dog-DAT killed, even so me-DAT he likes.
'In spite of the fact that he killed my dog, I still like him.'

Classical Sanskrit is another language instantiating correlatives over individuals. Examples of multiply-headed correlatives are provided below (from Andrews 1975):

(25) yasya yat paiṭṛkam ritkam, sa tad gṛhnĩta, netaraḥ.
who.GEN what.NOM paternal.NOM inheritance.NOM, he.NOM that.ACC should get, not another
'If someone has something as a paternal inheritance, then he should get it and not someone else.'

(26) yena yāvān yathā ′dharma dharma veha samīhitia, sa eva tatphalam
who.INST to what extent in what manner injustice justice or is done, he exactly the fruits thereof
būnkte tathā tāvad amutra vai
enjoy.FUT in that way to that extent in the other world indeed
'If someone does good or evil to some extent and in some way, then he shall enjoy the fruits thereof in the next world to that extent and in that way.'

Andrews (1975:96-97) makes the following remark about the interpretation of these sentences: "if the reader [...] feels at a loss as to how to interpret them, then there is a simple algorithm for constructing a paraphrase. Replace the *wh* words with [*some*-based indefinites] and recast the relative clause as a conditional. [...] I am informed that multiple headed relative clauses in Sanskrit characteristically have this property of being 'generic' statements of laws. One might think, therefore, to derive them from conditionals in some fashion. While this might suffice in Sanskrit, we will find Marathi examples of multiple headed and multiple *wh*-worded relative clauses which are not generic, but rather referential."

Thus, we see the double, referential & quantificational nature of correlatives surfacing in the case of individual-level correlatives too.

Multiply-headed correlatives have an additional property, already noticed by Andrews (1975) and brought into sharper focus in Dayal (1996) and Bittner (2001): "[...] in a well-formed correlative each coordinate of the *n*-tuple of topical referents introduced by the dependent clause must be picked up by an anaphor in the matrix comment [...]. Note that the correlatives need not be one-one because split antecedents are permitted, as noted by McCawley (1992) and illustrated by the Hindi example [(27) below]. What is not permitted are dangling topical referents in the dependent clause which the matrix comment fails to address. Hence the ill-formedness of [(28)], where the comment fails to say anything about the topical boy. The minimally contrasting [(29)] is good

again because the offending topical *j*-determiner, *jis*, is replaced with *ek* one. With this referent removed from the center of attention, the matrix comment is now properly about the *j*-marked topic." (Bittner 2001:40-41)

(27) Jo laRkii jis laRke-se baat kar rahii hai, ve dost haiN.
which girl which boy-INST talk do PROG is, DEM.PL friends are
'As for the girl and the boy she is talking to, they are friends.'

(28) *Jo laRkii jis laRke-se baat kar rahii hai, vo lambii hai.
which girl which boy-INST talk do PROG is, DEM tall.SG.F is
'As for the girl and the boy she's talking to, she is tall.'
(Hindi, Bittner 2001:41, (11a))

(29) Jo laRkii ek laRke-se baat kar rahii hai, vo lambii hai.
which girl one boy-INST talk do PROG is, DEM tall.SG.F is
'As for the girl who's talking to a boy, she is tall.'
(Hindi, Bittner 2001:41, (11b))

The constraint that every *wh*-topic has to be anaphorically picked up and commented on by the matrix clause becomes obvious only with individual-based correlatives because there always is a temporal or modal anaphor in the matrix clause of temporal/modal correlatives: it's the tense/mood morphology.

We will not discuss this feature of correlatives here, but instead return to the contrast between referential and quantificational interpretations of individual-based correlatives. This contrast is overtly marked in Hindi by the absence/presence of habitual morphology, as shown in (30) (from Brasoveanu 2008a, based on an example in Dayal 1996) and (31b) (from Brasoveanu 2008a) below.[1]

(30) jo laRkii lambii hai, vo khaRii hai.
which girl tall is, DEM standing is
'The one girl that is tall is standing.'

(31) a. bus-meN aam taur-pe kaun-sii laRkii khaRii hotii hai?
bus-in ordinary way-on which.F girl.F standing.F be-HAB.F be.PRS.SG
'Ordinarily, which girl stands on the bus?'

b. jo laRkii lambii ho-tii hai, vo khaRii ho-tii hai.
which girl tall be-HAB.F is, DEM standing be-HAB.F is
'It is the girl who is tall that stands.'

The contrast between the two interpretations is not morphologically realized in Romanian, as shown in (32) and (33) below. This is very similar to the contrast between the referential and quantificational interpretations of *when*-clauses in English, which is not (necessarily) morphologically realized either (see (2) vs. (3) and (4) above).

(32) Care fată şi = a = uitat ieri haina, pe aceea o = caută tatăl
Which girl her.DAT = HAS = forgotten yesterday coat.the, PE DEM.F.SG her.ACC = look for father.the
ei.
her.GEN
'The father of the girl that forgot her coat yesterday is looking for her.'
(Romanian, Brasoveanu 2008a:48, (2))

(33) Pe care om l = a = interogat Securitatea, în acela nu mai am
PE which person him.ACC = HAS = interrogated security.the, in DEM.M.SG not anymore have.1.SG
încredere.
trust
'I do not trust any person (whatsoever) that the secret police interrogated.'
(Romanian, Brasoveanu 2008a:48, (3))

1.4 Correlatives in the Degree Domain: Comparative Correlatives

In Romanian, we see the same variation between a referential and a quantificational (conditional-like) interpretation in comparative correlatives: compare the referential (34) and the quantificational (35) and (36) below (examples from Brasoveanu 2008b).

[1] I am indebted to an anonymous reviewer for providing the context in (31a) for the target sentence in (31b).

(34) Cu cît e mai înalt fratele decît sora, (tot) cu atît e mai înalt
With how much is more tall brother.the than sister.the, (also) with that much is more tall
tatăl decît mama.
father.the than mother.the
'The brother is taller than the sister by a certain amount and the father is taller than the mother by the same amount.'

(35) Cu cît e un avocat mai agresiv, cu atît e mai eficient.
With how much is a lawyer more aggressive, with that much is more efficient
'The more aggressive a lawyer is, the more efficient s/he is.'

(36) Cu cît e un număr natural mai mare decît altul, (#tot) cu atît e pătratul
With how much is a number natural more great than another, (#also) with that much is square.the
lui mai mare decît pătratul celuilalt.
it.GEN more great than square.the other.one.GEN
'The greater one natural number is (than another), the greater its square is (than the square of the other one).'

Sentence (34) is true iff (*i*) the brother is taller than the sister and the father is taller than the mother, that is, there is *no conditionality* (no 'if the brother is taller than the sister ...' kind of interpretation), and (*ii*) the difference in height between the brother and the sister is the same as the difference in height between the father and the mother, that is, the correlative *equates* the two differentials under consideration (this is particularly clear if the particle *tot* is present). Differentials, e.g., *2 cm* in the comparative *Gabby is 2 cm taller than Linus*, are phrases that specify the difference between two measurements, e.g., between Gabby's and Linus's heights.

Sentence (35) has two salient interpretations: (*a*) if a lawyer x is more aggressive than a lawyer y by a certain amount, then x is more efficient than y by a corresponding amount and (*b*) if a lawyer x is more aggressive at time t than at time t' by a certain amount, then x is more efficient at t than at t' by a corresponding amount. These two interpretations are not necessarily two distinct readings, since the second one is ultimately just a refinement of the first that examines the aggressiveness and efficiency of lawyers at various times as opposed to a single (contextually salient) temporal interval.

The interpretation of sentence (36) when the particle *tot* is present provides the strongest argument in favor of differential-based truth conditions for conditional (i.e., quantificationally-interpreted) comparative correlatives: (36) with *tot* is true iff, for any two natural numbers m and n such that m is greater than n, the difference $m - n$ is *identical* to the difference between their squares $m^2 - n^2$. In contrast, (36) without *tot* is intuitively true because it just says that, for any natural numbers m and n such that $m > n$, their positive difference $m - n$ corresponds to a positive difference between their squares $m^2 - n^2$.

See Andrews (1975:217 et seqq and 237 et seqq), McCawley (1988), Beck (1997), den Dikken (2005) and Cappelle (2010) (among others) for more examples of comparative correlatives in English, German and Chinese.

2 Uniqueness Effects in Correlatives

In this section, we start focusing exclusively on individual-domain correlatives (arguably the easiest to provide an explicit semantics for). The main goal is to more closely examine their variable uniqueness effects, i.e., their ambivalent referential & quantificational nature. The examples we will focus on are the single wh-topic correlatives in (37) (Hindi, based on Dayal 1996) and (38, 39) (Romanian) below (repeated from above) and the multiple wh-topic correlatives in (40) (Hindi, from Dayal 1996) and (41) (Romanian). The correlatives in (37) and (38) have a definite (referential) interpretation, the correlatives in (39) and (41) have a universal (quantificational) interpretation and the correlative in (40) has a mixed universal & definite interpretation.[2]

(37) jo laRkii lambii hai, vo khaRii hai.
which girl tall be.prs, DEM standing be.prs
'The one girl that is tall is standing.'

(38) Care fată şi=a=uitat ieri haina, pe aceea o=caută tată-l
which girl her.Dat=HAS=forgotten yesterday coat.the, PE DEM.F.SG her.Acc=look.for father-the
ei.
her.Gen
'The father of the girl that forgot her coat yesterday is looking for her.'

[2]There seems to be inter-speaker variation with respect to the readings associated with episodic multiple-topic correlatives in Hindi: some speakers agree with the claim in Dayal (1996) that sentence (40) has a mixed universal & definite reading, while others claim that (40) can have only an across-the-board definite reading: the (one) girl who played with the (one) boy defeated him.

(39) Pe care om l=a=interogat Securitate-a, în acela nu=mai=am
PE which person him.Acc=HAS=interrogated security-the, in DEM.M.SG not=anymore=HAVE.1sg
încredere.
trust
'I do not trust any person interrogated by the secret police anymore.'

(40) jis laRkii-ne jis laRke-ke saath khel-aa, us-ne us-ko haraa-yaa.
which girl-Erg which boy-with together play-pfv DEM-Erg DEM-Acc defeat-pfv
'Every girl that played against a boy is such that (she played against exactly one boy and) she defeated the one boy she played against.'[3]

(41) Cine ce mîncare şi=a=adus, pe aceea o=va=mînca.
Who what food REFL.Dat=HAS=brought PE DEM.F.SG it.Acc=WILL.3sg eat
'Everyone will eat whatever food they brought with them.'[4]

The main idea we will pursue is that the variation in interpretation (definite/unique vs. universal/non-unique) exhibited by these constructions follows from their ambivalent referential and quantificational nature, which is closely related to the ambivalent referential and quantificational nature of (wh) indefinites like *a/which frog* or definites like *the frog*. We will sketch an account of this variation in a dynamic system that is independently motivated by weak/strong donkey anaphora and quantificational/modal subordination (see Brasoveanu 2008c, 2010 for more details).

Correlative constructions provide a window into the nature of reference and quantification in natural languages and are relevant for theories of how semantics interfaces with both syntax and pragmatics. On the syntax/semantics side, correlatives are interesting because, just like donkey sentences, they have a quantifier-binding semantics without syntactic c-command. This is shown in (42) below[5], where Hindi – and, for all intents and purposes, Romanian – correlatives are analyzed as adjunction structures that are closely related to topicalization constructions like *Megan^x, I like her$_x$* (indexation convention: superscripts on antecedents, subscripts on anaphors[6]).

(42) $[_{\text{IP}}\ [_{\text{CP}}\ \text{which}^x\ \text{girl is standing}]\ [_{\text{IP}}\ \text{that}_x\ \text{one is tall}\ ]\ ]$

On the semantic/pragmatics side – which is our main focus here – correlatives display a universal vs. definite variation in interpretation both within a particular language and across languages. Intra-linguistic variation is exemplified by single vs. multiple topic correlatives in Hindi: *jo laRkii* (which girl) receives a definite/unique interpretation in (37) (single topic) and a universal/non-unique interpretation in (40) (multiple topic).

Also, compare the two Romanian single-topic correlatives: (38) has a definite/unique interpretation – it is infelicitous if there is more than one contextually salient girl who forgot her coat; in contrast, (39) has a universal/non-unique interpretation – it is felicitous in the actual world, where more than one person was interrogated by the secret police.

The definite correlative in (38) and the universal correlative in (39) are not morpho-syntactically different: in both cases, the subordinate clause is eventive *passé composé* and the matrix clause is stative present; that is, the difference in their interpretation is not due to their temporal-aspectual structure, e.g., generic present (*A dolphin eats fish and squid*) vs. episodic past (*A dolphin ate fish and squid*). So, this variation in interpretation seems to be a pragmatic matter: we deal with regular, habitual phenomena in (39) and accidental, sporadic ones in (38), and it is world knowledge, i.e., an extra-linguistic, pragmatic factor, that enables us to make this distinction.

As far as variation across languages is concerned, the morphologically unrealized contrast between the interpretations of the Romanian correlatives in (38) and (39) is overtly marked in Hindi: Dayal (1995) notes that single-topic correlatives have a universal reading if we switch from episodic to habitual morphology, as in (43) below (repeated from (31b) above).

(43) jo laRkii lambii ho-tii hai, vo khaRii ho-tii hai.
which girl tall be-hab.f be.prs, DEM standing be-hab.f be.prs
'A tall girl (generally) stands, e.g., in buses with very little leg room between seats.'

[3]Dayal (1996) does not provide a translation that clearly locates the uniqueness effects in the nuclear scope of the every quantification, but my informants report that this is the correct translation – as opposed to the truth-conditionally distinct 'Every girl that played against exactly one boy defeated him', which locates the uniqueness effects in the restrictor of the every quantification.

[4]A more natural (colloquial) variant is: *Cine ce şi-a adus, aia o să mănînce* (Everyone will eat whatever they brought).

[5]See Srivastav (1991) and Dayal (1995, 1996) and, also, Bhatt (2003) for a recent detailed discussion.

[6]Determiners are indexed because the non-determiner elements can be part of both antecedents and anaphors, e.g., *a/every frog* vs. *the/this/said frog*.

An informant remarks that, intuitively, (43) generalizes over situations in which there is a unique girl who is tall. About each such situation, we predicate that the girl in it stands.

Another instance of cross-linguistic variation is provided by multiple-topic correlatives, which have an across-the-board universal interpretation in Romanian[7] and a mixed universal & definite interpretation in Hindi.[8]

Thus, correlative constructions pose two problems: (*i*) the compositionality problem on the syntax/semantics side – in particular, the fact that the universal, quantificational reading does not require c-command and (*ii*) the 'uniqueness effects' variability on the semantics/pragmatics side – in particular, the connections between uniqueness effects on the one hand and, on the other hand, the semantics of habitual morphology in Hindi and the pragmatics of quantification at work in Romanian.

The first problem can be solved by taking a dynamic approach, which is specifically designed to compositionally capture syntactically non-local quantificational dependencies like donkey anaphora. We will not discuss the solution to this problem in much detail, but instead focus on solving the second, semantics/pragmatics problem.

3 The Semantics of Hindi Single-Topic Correlatives

This section reviews and elaborates on the account in Brasoveanu (2008a). We provide a semantics for Hindi correlatives that captures both their definite/unique and universal/non-unique interpretation. Romanian correlatives and the cross-linguistic variation issues raised above are discussed in section 4.

3.1 The Definite/Unique Interpretation

The Russellian analysis of definite descriptions derives their uniqueness by putting together a maximality and a singleton requirement, as shown in (45) below.

(44) The chair Leif brought is wobbly.

(45) $\underbrace{\exists x[\textsc{chair}(x) \wedge \textsc{bring}(\textsc{leif}, x)}_{\text{existence}} \wedge$
$\underbrace{\forall y[\textsc{chair}(y) \wedge \textsc{bring}(\textsc{leif}, y)}_{\text{maximality}} \rightarrow \underbrace{y = x]}_{\text{singleton}} \wedge \textsc{wobbly}(x)]$
$\underbrace{\qquad\qquad\qquad\qquad\qquad\qquad}_{\text{uniqueness}}$

The analysis can be alternatively represented in terms of set variables, as shown in (46).

(46) $\underbrace{\exists X[X \neq \emptyset}_{\text{existence}} \wedge \underbrace{X = \{y : \textsc{chair}(y) \wedge \textsc{bring}(\textsc{leif}, y)\}}_{\text{maximality}} \wedge \underbrace{|X| = 1}_{\text{singleton}} \wedge \textsc{wobbly}(X)]$
$\underbrace{\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad}_{\text{uniqueness}}$

The main proposal is that the definite/unique interpretation of Hindi (and Romanian) correlatives arises as a consequence of (*i*) the maximality contributed by the wh-indefinite in the topic/subordinate clause, together with (*ii*) the singleton requirement contributed by the singular demonstrative in the comment/matrix clause. This is shown in (47) below for sentence (37) above:

(47)

jo^X	laRkii	lambii	hai,		vo$_X$	khaRii	hai
which	girl	tall	be.prs,		DEM	standing	be.prs
$\exists X[X \neq \emptyset$	$\wedge$	$\underbrace{X = \{y : \textsc{girl}(y) \wedge \textsc{tall}(y)\}}_{\text{maximality}}$		$\wedge$	$\underbrace{\lvert X\rvert = 1}_{\text{singleton}}$	$\wedge$	$\textsc{standing}(X)]$

$\underbrace{\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad}_{\text{uniqueness}}$

That is, our Hindi episodic correlative with a single topic is interpreted as follows: (*i*) the topic clause introduces a set X containing all and only the individuals that satisfy both the restrictor and the nuclear scope property of the wh-indefinite, i.e., the set of tall girls – this is due to the maximality (in a sense, λ-abstraction) contributed

[7] This is clearer in examples like *Care ce problemă şi=a=ales, pe aceea o=va=rezolva* (Everyone will solve whatever problem, i.e., all & only the problems, they chose) or *Care ce subiect şi=a=ales, despre acela trebuie să=scrie* (Everyone must write about whatever topic, i.e., all & only the topics, they chose).

[8] If we look at triple-topic correlatives, we see that the generalization is as follows: the initial topic receives a universal interpretation and the other topics are unique relative to each value of the initial topic.

by the wh-indefinite; (*ii*) then, we check the comment clause relative to the set X, that is, we check that X is a singleton set – this is the singleton requirement contributed by the singular anaphor – and that the only girl in X is standing.

Note that we do not conflate Russellian definites (or universal quantifiers) and the maximal indefinites that are topics in correlative structures. Definites maximize only over their restrictor property (the same thing happens with universal quantifiers), i.e., we extract the set of individuals satisfying the restrictor property, and check that this set is a singleton and that it satisfies the nuclear scope property. Maximal indefinites maximize over both the restrictor and the nuclear scope property, i.e., we extract the set of individuals satisfying both of them, and we check that this set is non-empty. Thus, definites and maximal indefinites differ with respect to: (*i*) whether or not maximization includes the nuclear scope property and (*ii*) whether or not the singleton requirement is part of their meaning.

The way we use maximal indefinites becomes clearer if we look at a related phenomenon in English, namely the uniqueness effects associated with singular cross-sentential anaphora. Consider (48) and (49) below – and "suppose I need to borrow a chair [...] Leif has ten identical chairs, and he is willing to lend any of them. You can now say [(48)] to me [...]. In this situation, the NP *a chair* does not refer to a unique chair. [...] When anaphora is attempted, however, the uniqueness effect always shows up. Consider [(49)] in the same situation, and be sure that you are completely unable to distinguish any one of Leif's chairs from his other chairs. [...] Many speakers cannot use [(49)] in such a situation [...] [(48)] is only felicitous [...] [if] they are referring to a chair which is uniquely identified by some property." (Kadmon 1990: 279-280)

(48) Leif has a chair.

(49) Leif has a chair. It is in the kitchen.

These uniqueness effects can be derived in terms of maximal indefinites as shown in (50) below (Kadmon 1990 proposes a different analysis): the first sentence in (49) introduces a set X consisting of all and only the individuals satisfying the restrictor and nuclear scope properties of the indefinite, i.e., the chairs that Leif has; then, the second sentence in (49) checks that X is a singleton (due to the singular anaphor) and that the only chair in X is in the kitchen.[9]

(50)

Leif	has	a^X	chair.		It$_X$	is	in the kitchen.
$\exists X[X \neq \emptyset$	$\wedge$	$\underbrace{X = \{y : \text{CHAIR}(y) \wedge \text{HAVE}(\text{LEIF}, y)\}}_{\text{maximality}}$		$\wedge$	$\underbrace{\lvert X\rvert = 1}_{\text{singleton}}$	$\wedge$	IN-KITCHEN(X)]
		$\underbrace{\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad}_{\text{uniqueness}}$					

Thus, singular cross-sentential anaphora can be taken to provide independent justification for the proposed analysis of uniqueness effects in correlatives.

3.2 The Universal/Non-Unique Interpretation

The universal/non-unique interpretation of Hindi correlatives basically arises by interposing a distributivity operator, contributed by the habitual morphology in the matrix clause, between (*i*) the maximal wh-indefinite in the subordinate clause and (*ii*) the singleton requirement contributed by the singular demonstrative in the matrix.[10] This is shown in (51) below for the Hindi example in (43) above. The habitual morphology in the comment clause is fronted to make the correspondence with the logical translation more transparent.

(51)

jo^X laRkii	lambii ho-tii hai,		**ho-tii**	vo$_X$	khaRii [~~ho-tii~~] hai
which girl	tall be-hab.f be.prs,		**be-hab.f**	DEM	standing be.prs
$\exists X[X \neq \emptyset \wedge$	$\underbrace{X = \{y : \text{GIRL}(y) \wedge \text{TALL}(y)\}}_{\text{maximality}}$	$\wedge$	$\underbrace{\forall x \in X}_{\text{distributivity}}$	$[\underbrace{\lvert\{x\}\rvert = 1}_{\text{singleton}}$	$\wedge$ STANDING$(X)]]$
	$\underbrace{\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad}_{\text{universal interpretation}}$				

[9] Ordinary and wh-indefinites differ with respect to how their maximality comes about: maximality is always part of the semantics of wh-indefinites, but only a (pragmatic) default for ordinary indefinites. This enables us to account for non-unique singular anaphora (unlike Kadmon 1990), e.g., *Leif memorized a^x poem and I memorized a$^{x'}$ different$_x$ one/an$^{x'}$ other$_x$ one/a$^{x'}$ poem that was different from it$_x$*.

[10] For simplicity, I take habitual morphology in the subordinate clause to be an agreement marker with a vacuous semantic value (e.g., an identity function of the appropriate type). Nothing crucial rests on this – if habitual morphology is uniformly taken to contribute distributivity, we still derive the correct interpretation; see the appendix of Brasoveanu (2008a) for more details. An anonymous reviewer suggests that we could modify the present proposal to accommodate plural entities/non-atomic individuals and let the correlative clause contribute maximization or uniqueness relativized to cases/assignments depending on whether the correlative clause ranges over plural or singular entities, respectively. I leave the investigation of this idea and the comparison with the related proposals in Dayal (1995) and Jacobson (1995) for a future occasion.

The distributivity operator contributed by habitual morphology neutralizes the singleton requirement contributed by the singular anaphor. Therefore, the maximality of the wh-indefinite delivers the desired universal/non-unique interpretation.

But why would habitual morphology contribute a distributivity operator over individuals? In fact, it does not: I actually take habitual morphology to contribute *distributivity over cases/situations*, and only indirectly over the individuals featured in these cases/situations. Recall the informant's comment about the habitual correlative in (43): this correlative generalizes over situations in which there is a unique girl who is tall; about each such situation, we predicate that the girl in it stands.

The English discourses in (52) (Sells 1985) and (53) (Karttunen 1976) below exhibit a similar kind of distributivity, i.e., a similar kind of 'zooming in' on each case/situation under consideration: (52) says that for each case/situation featuring a chess set and a spare pawn, the pawn in the case/situation under consideration is taped to the top of the box; and (53) says that for each case/situation featuring a convention and a woman courted by Harvey at that convention, the woman in the case/situation under consideration comes to the banquet with Harvey.

(52) a. Every chess set comes with a^x spare pawn.
b. It$_x$ is taped to the top of the box.

(53) a. Harvey courts a^x woman at every convention.
b. She$_x$ always comes to the banquet with him.

Thus, the proposal is that the distributivity contributed by Hindi habitual morphology is the same as the distributivity contributed by *always* in (53) – or covertly supplied in (52).

We also need to slightly revise our semantics for wh-indefinites: they do not introduce maximal sets of individuals, but maximal sets of cases/situations featuring all and only the individuals that satisfy their restrictor and nuclear scope.

So, how should we formalize this pre-theoretical notion of case? "[A] case may be regarded as the tuple of its participants; and these participants are values of the variables [i.e., anaphors] that occur free in the open sentence modified by the adverb [e.g., *always* in (53)]. In other words, we are taking the cases to be the admissible assignments of values to these variables" (Lewis 1975: 5-7). That is, a case is a sequence of individuals assigned as values to whatever variables/anaphors we have. Importantly, formalizing maximality requires us to manipulate *sets* of such cases/sequences – unlike Lewis (1975), which manipulates single cases.

For example, the set of cases contributed by sentence (53a) relative to the empty set of cases $\emptyset$ (on the narrow-scope reading of the indefinite *a woman*) can be represented as the matrix below:

(54) $\emptyset \xRightarrow{\text{H. courts a}^x \text{ woman at every}^y \text{ convention}}$

x	y	
$woman_1$	$conv_1$	$woman_1$ is courted at $conv_1$
$woman_2$	$conv_2$	$woman_2$ is courted at $conv_2$
$woman_3$	$conv_3$	$woman_3$ is courted at $conv_3$

We store under the variable y all the conventions attended by Harvey and under x all the women courted by Harvey at the y-conventions. The cases/sequences encode the dependencies between conventions and women in a distributive, pointwise manner: $woman_1$ is courted at convention $conv_1$, $woman_2$ is courted at convention $conv_2$ etc. Then, sentence (53b), in particular the adverb *always*, instructs us to *distributively* test this set of sequences: for each sequence, we check that the x-woman came to the banquet of the y-convention, i.e., for the first sequence/row, we check that $woman_1$ came to the banquet of $conv_1$ etc.

A compositional account of quantificational subordination along these lines (also, of donkey anaphora and modal subordination) is provided in Plural Compositional DRT (PCDRT; Brasoveanu 2008c, 2010). We will use the same, independently motivated framework to account for the way in which correlatives are interpreted. The analysis, outlined in the following section, can be reformulated in situation-based terms if suitable adjustments are made, e.g., quantificational structures are taken to manipulate *sets* of (minimal) situations and not single situations etc.

3.3 Correlatives in Plural Compositional DRT (PCDRT)

The definite/unique single-topic correlative is analyzed as before, except that the tall girls are stored one at a time in a set of sequences and not lumped together in a single sequence storing the whole set – as shown in (55) below.

(55)

jo^x laRkii lambii hai,		vo$_x$	khaRii hai
which girl tall be.prs,		DEM	standing be.prs
max^x(GIRL(x) ∧ TALL(x))	∧	**singleton**(x)	∧ STANDING(x)

x		x	
$girl_1$	⇒	$girl_{1/2/3}$	$\{girl_1, girl_2, girl_3\}$
$girl_2$		$girl_{1/2/3}$	is a singleton, i.e.:
$girl_3$		$girl_{1/2/3}$	$girl_1 = girl_2 = girl_3$

The **max**^{x} operator is dynamic λ-abstraction: (i) we extract the set of individuals satisfying the formula in the scope of the **max**^{x} operator (this is the static part), then (ii) we store it under x and pass it on to the next clause (this is the dynamic part).

The universal/non-unique single-topic correlative is also analyzed as before, except that habitual morphology distributes over the topical set of sequences, i.e., it distributes over the rows of the matrix that we obtain after we interpret the topic clause. As shown in (56) below, the topic clause receives the same interpretation as in (55) above. The comment clause, however, is differently interpreted due to the distributivity operator **dist** contributed by habitual morphology: the **dist** operator breaks the input set of sequences into its singleton subsets and requires the formula in its scope, i.e., the remainder of the comment clause, to be evaluated relative to each such singleton subset.

(56)

jo^x laRkii lambii ho-tii hai,		**ho-tii**	vo$_x$	khaRii [~~ho-tii~~] hai
which girl tall be-hab.f be.prs,		**be-hab.f**	DEM	standing be.prs
max^x(GIRL(x) ∧ TALL(x))	∧	**dist**	(**singleton**(x)	∧ STANDING(x))

x		x	
$girl_1$	⇒	$girl_1$	$\{girl_1\}$ is a singleton
$girl_2$		$girl_2$	$\{girl_2\}$ is a singleton
$girl_3$		$girl_3$	$\{girl_3\}$ is a singleton

So, **dist** ensures the vacuous satisfaction/neutralization of the condition **singleton**(x): given that each set of sequences delivered by **dist** is a singleton, the set will store only one value for x. Hence, the **max**^{x} operator contributed by the wh-indefinite yields the desired universal/non-unique interpretation (see the appendix of Brasoveanu 2008a for more formal details).

To summarize, the variable uniqueness effects associated with correlative constructions emerge as a result of the interaction of three distinct components: (i) the *maximality over cases/situations* contributed by wh-indefinites, which update the context by introducing all the individuals that satisfy both their restrictor and their nuclear scope; (ii) the *singleton* requirement contributed by singular anaphors – this requirement applies to the set of cases/situations relative to which the anaphor is interpreted; (iii) the *granularity level* of the quantification denoted by the entire correlative construction – this granularity level is specified in Hindi by the presence vs. absence of habitual morphology.

In particular, the quantification can be *coarse-grained/episodic*, i.e., we collectively quantify over the topical cases/situations introduced in the topic clause, which boils down to quantifying over topical individuals – and the comment clause is predicated of these individuals. This yields the definite/unique interpretation.

Alternatively, the quantification can be *fine-grained/habitual*, i.e., we distributively quantify over the topical cases/situations introduced in the topic clause – and the comment clause is predicated of each case/situation. This yields the universal/non-unique interpretation.

4 Romanian Correlatives and the Pragmatics of Quantification

Romanian does not have habitual morphology. So, both unique and non-unique readings are available for single-topic correlatives – see (38) and (39) above. In contrast, habitual morphology is *available* in Hindi to express non-unique readings, so it *has to be used* to express such readings. This is an optimality-theoretic kind of reasoning: if a better candidate is *available* in a particular linguistic system – in our case, a candidate that pairs morphology and meaning more 'transparently', then this candidate *is* the grammatical one (unless there's an even better candidate); see Farkas & de Swart (2003) for a related proposal with respect to noun incorporation.

Thus, the proposal is that the availability of habitual morphology in Hindi forces single-topic correlatives without habitual morphology to have a definite/unique reading. In Romanian, both readings can be associated with the same morpho-syntactic structure because no such morphology is available. That is, I think that the most appealing line of analysis is to reject the idea that Romanian has *covert* habitual morphology of the

kind overtly exhibited by Hindi, e.g., a covert generic operator present whenever we have a universal reading. Instead, we should derive a single, underspecified semantic representation whose interpretation is further specified by pragmatic factors, e.g., the accidental/sporadic vs. non-accidental/habitual nature of the situations under consideration. However, it is difficult to distinguish between such an analysis and an alternative account that associates two distinct semantic representations with the same surface form and lets pragmatics disambiguate between the two in any given context—so I will leave this issue open here.[11]

That is, the proposal is that the interpretation of correlative structures (and quantificational structures in general) involves a *granularity* level, i.e., a specification of the way in which the comment clause (in general: the nuclear scope) is predicated of the cases/situations characterized by the topic clause (in general: the restrictor). The granularity level of the quantification can be specified only pragmatically, as in Romanian, or there can be grammatical/semantic means to constrain its specification, as in Hindi. This situation is similar to the cross-linguistic variation with respect to the inclusive vs. exclusive specification for 1^{st} person plural pronouns.

Independent evidence for the idea that the interpretation of quantificational structures involves a granularity level that is only pragmatically specified comes from English examples like (57) below from Krifka (1990).

(57) Four thousand ships passed through the lock last year.

Sentence (57) "has two readings [...] the *object-related* reading says that there are four thousand ships which passed through the lock last year [...] the *event-related* reading says that there were four thousand events of passing through the lock by a ship last year. The [former] reading presupposes the existence of (at least) four thousand ships [...]. In the [latter] reading, there might be fewer ships in the world" (Krifka 1990: 487).

The variation in ship individuation/counting is parallel to the way we interpret the singleton requirement contributed by singular anaphors in correlatives: the 'object-related', individual-based reading yields the definite interpretation, while the 'event-related', case/situation-based reading yields the universal interpretation.

Moreover, just as the granularity level of Romanian correlatives is dependent on pragmatic factors, the selection of a granularity level for examples like (57) is pragmatically constrained: "it is no accident that the best examples of [event-related readings] concern situations in which there are too many individuals to keep track of easily [...]. It is much more difficult to get [such a] reading [for (57)] when only a small number of ships are involved. [For example, consider] the Chicago River–Lake Michigan sightseeing route, which we can assume is plied by just four sightseeing ships. It would be odd to say that *Four thousand sightseeing ships passed through the lock last year* even if each of the four ships did go through 1000 times" (Barker 1999: 689-690).

This sensitivity to pragmatic factors, i.e., world knowledge, is left unexplained if we postulate two *covertly* different (object-related vs. event-related) denotations for the cardinal indefinite *four thousand* (as Barker 1999 observes).[12] Similarly, the fact that the choice between a definite and a universal reading for Romanian correlatives is sensitive to pragmatic factors would be left unexplained if we postulated the existence of covert habitual morphology in Romanian.

We conclude this discussion with the observation that analyzing single-topic correlatives (in both Hindi and Romanian) in terms of maximal sets of cases/situations – as opposed to maximal sets of individuals – is independently motivated by the interpretation of multiple-topic correlatives. In multiple-topic correlatives, we have anaphora to both *sets* of individuals and the *dependency* between them introduced in the topic clause. For example, the Hindi correlative in (40) introduces a set of girls and, for each girl, the boy she played against. Then, the comment clause elaborates on this PLAY-AGAINST relation – and not only on the bare, 'unstructured' sets of boys and girls: each girl defeated the boy she played against and not some other boy that some other girl played against. This is parallel to English example (53) above: the COME-TO-BANQUET relation elaborates on the previously introduced COURT-AT relation between women and conventions, and not simply on the bare sets of women and conventions.[13]

Thus, if we have only maximal sets of individuals and distribute over such sets, there is no guarantee that the comment clause elaborates on the relation(s) between these sets mentioned in the topic clause. But if the topic clause introduces a maximal set of cases/situations, these cases/situations encode both sets of individuals and dependencies between them, so the comment clause can simultaneously elaborate on both.

[11] I am indebted to two anonymous reviewers for a careful discussion of this point.

[12] Geurts (2002) argues that a similar, pragmatically-determined granularity level is at work in the case of donkey anaphora.

[13] The mixed universal & definite interpretation of multiple-topic Hindi correlatives can be captured by means of selective distributivity. Instead of unselectively (in the sense of Lewis 1975) distributing over cases/situations with the operator **dist**, we have a level of quantificational granularity that is intermediate between coarse-grained quantification over individuals and fine-grained quantification over cases. This is encoded by an operator $\mathbf{dist}_x$ (see Brasoveanu 2010 for its definition), which distributes over the cases featuring the values of the variable x contributed by the initial topic, hence the universal interpretation of x, but for each value of x, the set of situations featuring that value are treated collectively, hence the definite interpretation of all non-initial wh-topics in Hindi. See Gajewski (2008) for a detailed analysis of how this interpretation can arise compositionally.

5 Previous Approaches

The semantics of Hindi correlatives is discussed in detail in Dayal (1996) (elaborating on Srivastav 1991 and Dayal 1995) and Bittner (2001).

Dayal (1995) examines habitual single-topic correlatives in Hindi and informally suggests that an account formulated in terms of (minimal) situations (Heim 1990 style) should be feasible. However, the formally explicit analysis in Dayal (1996) explicitly rejects the idea advanced in Andrews (1975) that correlatives contribute quantificational structures of the same kind as donkey sentences: "correlatives and conditionals [like *If a farmer owns a donkey, he beats it*] encode fundamentally different dependencies" (Dayal 1996: 198). Two reasons are invoked for this claim. First, "in a correlative construction the number of wh expressions must match the number of demonstratives anaphoric to them. This, of course, is not true of conditionals" (Dayal 1996: 198), e.g., there is no pronoun co-referring with the indefinite *a donkey* in *If a farmer owns a donkey, he is happy.* Secondly, the static or dynamic approaches to donkey sentences available at the time failed to capture the definite vs. universal variation in interpretation exhibited by correlatives.

Dayal (1996) then proceeds to account for the range of interpretations that single and multiple topic correlatives have by postulating three different kinds of quantificational structures: (*i*) quantification over individuals for single-topic correlatives with a definite interpretation; (*ii*) quantification over (minimal) situations for single-topic correlatives with a universal interpretation; and finally, (*iii*) quantification over suitable functions for multiple-topic episodic correlatives – for example, the quantification contributed by (40) above involves the function associating every girl with the one boy she played against.

The variation in quantification between individual and functional variables is attributed to an ambiguity in the interpretation of a covert [+wh] complementizer head that Dayal (1996) assumes to be present in subordinate/topic clauses: "I assume that C^0_{+wh} of a multiple wh relative clause denotes a set of relations [...] The whole sentence is true if the relation denoted by the main clause is included in this set [...] The wh expressions trigger this meaning but are otherwise interpreted as ordinary indefinites." (Dayal 1996:200). Thus, the two quantificational forces (definite and universal) associated with single and multiple topic episodic correlatives are attributed to two suitable meanings for a wh-complementizer morpheme that is not realized in the surface structure. Furthermore, it is not clear how to integrate the quantification over individuals or functions contributed by this covert and ambiguous complementizer with the quantification over situations contributed by correlatives with habitual morphology.

Turning now to Bittner (2001), it is clear that the account of Hindi episodic correlatives sketched above is a descendant of the dynamic analysis of correlatives proposed in Bittner (2001) (see in particular the discussion on pp. 52-53): both Bittner (2001) and the present analysis follow Andrews (1975) and treat the quantificational dependencies expressed by conditionals and correlatives in the same way.

Bittner (2001) captures Dayal's observation that correlatives (but not conditionals) have to anaphorically refer back to all the wh-indefinites in the topic clause by means of an 'aboutness' presupposition associated with correlative structures.[14] The 'aboutness' presupposition is due to the fact that wh-indefinites in correlatives are *topics*, which is not (always) true about ordinary indefinites in conditionals, and we cannot mark an indefinite as topical by means of wh-morphology and not comment about it: "the intuitive idea is that topic-comment sequencing presupposes that the comment is about the topic. [A correlative update] requires [...] every topical discourse referent introduced in the topic update [to] be picked up by an anaphoric demonstrative in the comment update" (Bittner 2001: 48).

There are two notable differences between Bittner (2001) and the present proposal. First, Bittner (2001) does not associate the maximality and singleton requirements with particular morphemes, but with a topical maximization operator that always occurs in correlative constructions and that takes scope over the entire subordinate/topic clause. Secondly, Bittner (2001) accounts only for the definite/unique interpretation of single-topic correlatives (see p. 54, fn. 7) and it is not clear how the account can be extended to capture universal/non-unique interpretations of single and multiple topic correlatives in Hindi and Romanian. That is, the account in Bittner (2001) is open to the second objection mentioned above that Dayal (1996) raises against unified accounts of conditionals and correlatives.

The account sketched here shows that this is only an objection against dynamic (or situation-based) approaches that update single cases/assignments, as classical DRT/FCS – and also Bittner (2001) – do. In contrast, systems like the one proposed in Brasoveanu (2010) (building on van den Berg 1996; see also Nouwen 2003), which update sets of cases/assignments, are well suited to provide a unified account of donkey conditionals and correlatives that derives their full range of cross-linguistically attested readings.

[14] This proposal can be incorporated into the present account. Ivan Sag (p.c.) suggests an alternative, syntactic account: assuming that correlatives involve a kind of wh-extraction similar to extraction from coordination structures (Pollard & Sag 1994), the 'topic-comment matching' constraint follows from the fact that only across-the-board extraction is possible from coordination islands.

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References

Andrews, A. (1975). *Studies in the Syntax of Relative and Comparative Clauses*. PhD dissertation, MIT [Published by New York: Garland, 1985].

Barker, Chris (1999). Individuation and Quantification. In *Linguistic Inquiry* **30**, 683-691.

Beck, S. (1997). On the Semantics of Comparative Conditionals. In *Linguistics and Philosophy* 20, 229-271.

van den Berg, M. 1996. *Some aspects of the Internal Structure of Discourse. The Dynamics of Nominal Anaphora*, PhD dissertation, University of Amsterdam.

Bhatt, Rajesh (2003). "Locality in Correlatives", in *Natural Language and Linguistic Theory* **21**, 485-541.

Bittner, M. (2001). Topical Referents for Individuals and Possibilities, in the *Proceedings of SALT XI*, Hastings. R et al (eds.), CLC, Cornell University, Ithaca 36-55.

Brasoveanu, Adrian (2008a). Uniqueness Effects in Correlatives. In *Proceedings of Sinn und Bedeutung 12*, A. Grønn (ed.), Oslo: ILOS 2008 (ISBN 978-82-92800-00-3), 47-65.

Brasoveanu, Adrian (2008b). Comparative Correlatives as Anaphora to Differentials. In the *Proceedings of SALT XVIII*.

Brasoveanu, Adrian (2008c). Donkey Pluralities. In *Linguistics and Philosophy* 31, 129-209.

Brasoveanu, Adrian (2010). Decomposing Modal Quantification. In *Journal of Semantics*, Advance Access published July 20, 2010, doi:10.1093/jos/ffq008.

Cappelle, Bert (2010). The "the... the..." Construction: Meaning and Readings. In *Journal of Pragmatics*, in press, doi:10.1016/j.pragma.2010.08.002.

Dayal, Veneeta (1995). Quantification in Correlatives. In *Quantification in Natural Language*, E. Bach, E. Jelinek, A. Kratzer & B. Partee, Dordrecht: Kluwer, 179-205.

Dayal, Veneeta (1996). *Locality in Wh Quantification: Questions and Relative Clauses in Hindi*, Dordrecht: Kluwer.

den Dikken, M. (2005). Comparative Correlatives Comparatively. In *Linguistic Inquiry* 36, 497-532.

Farkas, Donka F. & Henriette de Swart (2003). *The Semantics of Incorporation*, Stanford: CSLI.

Gajewski, J. (2008). On the Semantics of Hindi-Urdu Multiple Correlatives. In *Linguistic Inquiry* 39, 327-334.

Gallin, Daniel (1975). *Intensional and Higher-Order Modal Logic with Applications to Montague Semantics*, North-Holland Mathematics Studies.

Geach, P.T. (1962). *Reference and Generality*, Ithaca: Cornell University Press.

Geurts, Bart (2002). Donkey Business. In *Linguistics and Philosophy* **25**, 129-156.

Groenendijk, Jeroen & Martin Stokhof (1991). Dynamic Predicate Logic. In *Linguistics and Philosophy* **14**, 39-100.

Hale, K. (1976). The Adjoined Relative Clause in Australia. In *Grammatical Categories in Australian Languages*, R. Dixon (ed.), Canberra: Australian Institute of Aboriginal Studies, 78-105.

Heim, I. (1982). *The Semantics of Definite and Indefinite Noun Phrases*, PhD dissertation, UMass Amherst [published in 1988, StateNew York: Garland].

Heim, I. (1990). E-Type Pronouns and Donkey Anaphora. In *Linguistics and Philosophy* **13**, 137-177.

Jacobson, P. (1995) On the quantificational force of English free relatives. In *Quantification in Natural Language*, E. Bach, E. Jelinek, A. Kratzer & B. Partee (eds.), Dordrecht: Kluwer, 451-486.

Kadmon, Nirit (1990) "Uniqueness", in *Linguistics and Philosophy* **13**, 273-324.

Kamp, Hans (1981) "A Theory of Truth and Semantic Representation", in *Formal Methods in the Study of Language*, Part 1, J. Groenendijk, T. Janssen & M. Stokhof (eds.), Amsterdam: Mathematical Center, 277-322.

Karttunen, Lauri (1976) "Discourse Referents", in *Syntax and Semantics, Volume 7: Notes from the Linguistic Underground*, J.D. McCawley (ed), New York: Academic Press, 363-385.

Krifka, Manfred (1990) "Four Thousand Ships Passed through the Lock: Object-Induced Measure Functions on Events", in *Linguistics and Philosophy* **13**, 487-520.

Lewis, David (1975) "Adverbs of Quantification", in E. Keenan (ed), *Formal Semantics of Natural Language*, Cambridge: Cambridge University Press, 3-15.

Link, Godehard (1983) "The Logical Analysis of Plurals and Mass Terms: A Lattice-Theoretical Approach",

in *Meaning, Use and Interpretation of Language*, R. Bauerle, C. Schwarze & A. von Stechow (eds.), Berlin: Walter de Gruyter, 302-323.
McCawley, J. (1988). The Comparative Conditional Construction in English, German and Chinese. In *Proceedings of BLS 14*, 176-187.
McCawley, J. (1992). Remarks on Adsentential, Adnominal and Extraposed Relative Clauses in Hindi. Presented at *South Asian Languages Analysis*, Stanford University.
Moens, M. & M. Steedman (1988). Temporal Ontology and Temporal Reference. In *Computational Linguistics* 14, 15-28.
Montague, Richard (1973). "The Proper Treatment of Quantification in Ordinary English", in *Formal Philosophy* (1974, ed.: R. Thomason), New Haven: Yale University Press, 247-270.
Muskens, Reinhard (1996) "Combining Montague Semantics and Discourse Representation", in *Linguistics and Philosophy* 19, 143-186.
Nelken, R. & N. Francez (1995). Splitting the Reference Time: Temporal Anaphora and Quantification in DRT. In *Proceedings of the 7^{th} Conference of the European Chapter of the Association for Computational Linguistics*, 261-266.
Nelken, R. & N. Francez (1997). Splitting the Reference Time: The Analogy between Nominal and Temporal Anaphora Revisited. In *Journal of Semantics* 14, 369-416.
Nouwen, Rick (2003) *Plural Pronominal Anaphora in Context*, PhD dissertation, UiL-OTS, Utrecht University, LOT Dissertation Series 84.
Partee, B. (1984). Nominal and Temporal Anaphora. In *Linguistics and Philosophy* 7, 243-286.
Pollard, Carl & Ivan Sag (1994) *Head-Driven Phrase Structure Grammar*, Chicago: University of Chicago Press.
Roberts, C. (1989). Modal Subordination and Pronominal Anaphora in Discourse. In *Linguistics and Philosophy* 12, 683-721.
Sells, Peter (1985) *Restrictive and Non-Restrictive Modification*, Report No. CSLI-85-28, Stanford University: CSLI.
Srivastav, Veneeta (1991) "The Syntax and Semantics of Correlatives", in *Natural Language and Linguistic Theory* **9**, 637-686.
Stone, M. (1997). The Anaphoric Parallel between Modality and Tense. IRCS Report 97-06, University of Pennsylvania, Philadelphia.
Stone, M. (1999). Reference to Possible Worlds. RuCCS Report 49, Rutgers University, New Brunswick.
Webber, B. (1988). Tense as Discourse Anaphor. In *Computational Linguistics* 14, 61-73.