

From Old English to Middle English: Universal Quantifiers

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1. Introduction

This talk outlines the development of universal quantifiers during Middle English (ME).

Starting point: Old English (OE) indeterminates and the semantic analysis in Beck (2020):

- alternative semantic system: [OP [... alternative trigger ...]]

The study: Early ME and Late ME quantifiers in PPCME

- reduced version of OE system in Early ME

- loss of evidence for OE system in Late ME

- possibility of a Modern English quantificational system with Generalized Quantifiers

The study is part of the larger project, the **Universal Semantic Cycle (USC)**.

2. Background: Old English (OE)

2.1. Summary of key data

- Beck (2020): Evidence from OE from YCOE via CorpusSearch (see the paper for methodology, or ask me);

- three series of indeterminate pronouns: bare, GE- and A-series.

Bare: *hwa* 'who', *hwæt* 'what', *hwelc* 'which', *hwær* 'where', *hwæðer* 'which of two' ...

GE-: *gehwa*, *gehwæt*, *gehwelc*, *gehwær*, ...

A-: *æghwa*, *æghwæt*, *æghwelc*, *ælc*, ...

- bare series is interrogative, existential and universal (and polarity sensitive):

(1) a. Gif he nyte, **hwa** hit stæle, geladige hine selfne,
 if he neg.know who it stole clear him self
 þæt he ðær nan facn ne gefremede.
 that he there neg.one deceit not comit
 (colawafint, LawAfEl:28.73)

'If he doesn't know **who** stole it, let him clear himself that he didn't commit
 deceit.'

(interrogative)

b. & on ðæm chore beoð manige menn gegadrode
 and in the dance are many men gathered
 anes hwæt to singanne anum wordum & anre stefne.
 (of) one what to sing (with) one word and one voice

(cocura, CP:46.347.4.2336)

'and in the dance a number of men are assembled to sing **something** with the same
 words and voice.' (Sweet)

(existential)

c. Hie ða gesetton, for ðære mildheortnesse þe
 they then set, for that mercy that
 Crist lærde, æt **mæstra hwelcre misdæde** þætte
 Christ taught, for almost which misdeed that
 ða weoruldhlafordas moston mid hiora leafan buton
 the worldly lords should with their leave without
 synne æt þam forman gylte þære fiohbote onfon,
 sin at the first offence that compensation take
 þe hie ða gesettan.
 that they then set.

(colawafint, LawAfEl:49.7.135)

'They then ruled, for the mercy that Christ taught, for **almost every misdeed**, that the worldly lords should with their leave without any sin on the first offence to accept pecuniary compensation, that they then set.' (universal)

- GE-series is universal and existential (and polarity sensitive - NPI and FCI):

(2) a. Swa þonne her fram þære arleasan ðeode, hwæðere rihte
 so then here from that impious people though just
 Godes dome, **neh ceastra gehwylce** & land
 God's judgement near (of) cities every (pl) and land
 forheregeode wæron.
 wasted were

(cobede, Bede_1:12.52.27.487)

(universal)

'So then here **almost every city** and district was wasted by this impious people, though it was by the just judgment of God.' (Miller)

b. & brohte of his weorce **gehwylce** grene &
 and brought of his work GE-which green and
 wel stincende wyrta.
 good smelling herbs

(cogregdC, GDPref_and_3_[C]:1.181.16.2225)

(existential)

'and brought from his work **some** green and pleasantly smelling herbs.'

(3) **Gehwar** hi syn hefige **gehwar** eac medeme
 GE-where they are heavy GE-where also moderate

'in **some** places they are heavy, in **others** moderate'

(existential)

(Liebermann p. 446 (Rectitudines singularum personarum AD 960-1060 c.1025?))

- A-series can be interpreted as universal, NPI and FCI:

(4) a. & suelc mon se ðet lond hebbe **eghwylce** **Sunnandege**
 and such man that this land has each Sunday
 XX gesuflra hlafa to ðare cirican for Ealdredes saule & for Ealhburge.
 twenty 'gesufl' loaves to the church for Ealdred's soul and for Ealzburg's
 (codocu1, Ch_1195_[HarmD_5]:9.75)

'And whoever has this land [is to give] twenty 'gesufl' loaves to the Church, **every Sunday**, for the souls of Ealdred and Ealzburg.' (Harmer V p. 44)

- b. And a. a. a. to worulde buton **æghwīlcum ende** Amen
 and ever ever ever to world without A-GE-which end Amen
 'And ever, to time without end.' (...without **any end...**)
 (K-T; Ælfred's Boethius, Sedgefield 1899, p149 (final prayer))
- c. Sua ðu meah **ælcne unðeaw** on ðæm menn æresð be
 so you can **ÆLC vice** in the man first by
 sumum tacnum ongietan, hwæs ðu wenan scealt, ær
 some sign recognize, what you expect shall, before
 he hit mid wordum oððe mid weorcum cyðe.
 he it with word or with deed make known
 (cocura,CP:21.157.19.1076)
 'So you can recognize **any vice** in the man first by some sign, what to expect,
 before he reveals it with words or deeds.' (Sweet)
- c'. All plausible propositions 'that you can recognize x by some sign'
 (x a possible vice in the man) are true.
 (intuition: if x were a vice in the man, you could recognize x first by some sign.)

- (5) FCI *any*: Any student can solve this problem.
 'All plausible propositions 'x can solve this problem' (where x is a
 potential student) are true.'
 (intuition: if x were a student, x could solve this problem.)
 $\forall x[\exists w'[w'R@ \& \text{student}(x)(w')]] \rightarrow$
 $\exists w'\exists y[w'R'@ \& \text{solve}(\text{this_problem})(x)(w')]]$

- summing up:

(6)	question	FCI	NPI	Univ	Exist
bare series	✓	✓		✓	✓
GE-series		✓	✓	✓	✓
A-series		✓	✓	✓	

2.2. Summary of Analysis

An **alternative based system of quantification** (Hamblin 1973, Kratzer & Shimoyama 2002, Krifka 1995, Menendez-Benito 2010, a.m.o.) is applied to OE in Beck (2020) (see **Appendix B**).
Motivation: evidence for alternative semantics (question semantics, polarity sensitivity) and pervasive ambiguity (dissociating the indeterminate from the alternative sensitive operator).

(7) [OP ... [... indeterminate ...] ...]

- (8) a. [OP [XP *hwa left*]]
 b. $\llbracket hwa \rrbracket = \{x: x \in D\}$
 c. $\llbracket hwa \text{ left} \rrbracket = \{\text{that } x \text{ left} \mid x \in D\}$

Bare series: OP = Q, EXIST and ALL (and All-Alt)
 GE-series: OP = (EXH, All-Alt.) EXIST and ALL
 A-series: OP = EXH, All-Alt, and ALL

question - OP=Q: [Q [... indeterminate pronoun ...]]
|_____|

(9) Which alternatives in {that x left | $x \in D$ } are true?

existential - OP=EXIST: [EXIST [... indeterminate pronoun ...]]
|_____|

(10) There is a p in {that x left | $x \in D$ } such that p is true

universal - OP=ALL: [ALL [... indeterminate pronoun ...]]
|_____|

(11) For all p in {that x left | $x \in D$ }: p is true

NPI - OP=EXH: [EXH [... indeterminate pronoun ...]]
|_____|

(12) The ordinary meaning in {that x left | $x \in D$ } is true
and all stronger alternatives are false.

FCI - OP-All-Alt: [All-Alt [... indeterminate pronoun ...]]
|_____|

(13) All plausible p in {that x left | $x \in D$ & x is a possible alternative} are true.

- constraining the A-series to universal interpretations only:

(14) [NegP [iNeg] [... n-word[uNeg] ...]]
|_Agree_____| e.g. Penka (2011)
negative concord

(15) a. [ALL [*a-ge-hwa left*]]
|_____| universal agreement
b. All propositions 'x left' ($x \in D$) are true.

(16) a. [All-Alt [*can you recognize a-hwelc vice*]]
|_____| universal agreement
b. All plausible propositions 'you can recognize x (x a possible vice)' are true.

(17) a. [EXH [not [*time had a-hwelc end*]]]
|_____| universal agreement
b. Time didn't have an end and all stronger alternatives are false.

(18) universal agreement:
A-series indeterminate pronoun: [u \forall]
ALL, All-Alt, EXH: [i \forall]

- => **Summary OE indeterminate pronouns:**
- question and polarity semantics indicative of alternative semantics
 - morphology a clue to alternative trigger
 - pervasive ambiguity in favour of covert alternative evaluating operator
 - feature [uV]/[iV] governs interpretive range of A-series

3. Quantifiers during Middle English (ME)

Research question - empirical: What happened next?

Theoretical question: And how can we get from such a system of quantification to the standard semantics posited for Modern English, Generalized Quantifier semantics (GenQ)?

- => study of Early and Late ME reveals how the OE system changed and was lost.

3.1. Early ME (EME)

What we will see: The feature system of the A-series comes to play a larger role, narrowing down the relationship between trigger and operator - reduction of combinatory freedom of OE.

- search of PPCME (Kroch & Taylor (2000)) ME1 and MEx1 files (ME1: ca. 1150-1250) for all forms of the descendants of the OE indeterminate pronouns from section 2 known from descriptive sources (e.g. Kahlas-Tarkka (1987)).

- 14 files (see **Appendix A**) with a combined word count of 258 090.

- descendants of **non-bare indeterminates** found in these files:

(19) **simple** forms of *ælc* (a), and *gewhælc* and potentially *æghwælc* (b):

- a. *ælc, ælch, ællch, alch, ealch etc, illc, ilch, elch, euich, euch, euhc, uch, vch, uh, vh, evch, vhch, euh, euc, ech*
- b. *iwilc, iwillc, ewilch, uwilch, uwilc*

(20) **complex** forms going back to *æfre ælc* 'ever each':

- eauer euich, eauer euch, eauer vh, euerihc, auerihc, efrich, efred, æuric, aurilch, aurich, eurech, euric, efri*

- the search produced exactly 500 occurrences. I classified those occurrences for interpretation. Expected: universal, FCI, NPI (would have noticed: interrogative, existential, and potentially others; no such interpretations occurred).

- difficulty from OE concerning the distinction of universal from FCI interpretations persists. An occurrence was classified as FCI only if it occurred in a context in which FCIs are licensed **and** there was evidence that an intensional flavour was intended for the example; otherwise classified as universal, although an FCI reading is possible.

- result:

(21)	500 total	462 simple	432 universal 22 NPI 8 FCI
		38 complex	35 universal 3 NPI - FCI

- examples of simple forms going back to *ælc*:

- (22) a. & **illc** **an** **king** oppnede þær Hiss hord off hise maddmess,
& each one king opened there his store of his treasure
(CMORM,I,224.1854) *universal*
'and **each king** opened there his store of his treasure'
- b. ah buten **euch** **fearlac** bitahte al hire feht in
but without any fear entrusted all her fight in
hire helendes hont
her healer's hand
(CMKATHE,28.150) *NPI*
'but without **any fear** entrusted all her fight into her Healer's hands,'
- c. to **euch** **preost** mei ancre schriuen hire of swich
to each priest may anchoress confess herself of such
utterliche sunnen þe alle biualleð.
obvious sins that all befall
(CMANCRIW-2,II.255.143) *FCI*
'An anchoress may confess herself to **any priest** of obvious sins that happen to anyone' (Savage & Watson p174)

- context of (22c): a grave sin on the part of an anchoress requires confession to a particular priest, but for things that might happen to anyone, any priest will do. I considered this convincing evidence that an FCI reading was intended (cf. the translation in the PPCME base edition).

- examples of simple forms going back to *gehwelc*: here as well, clear cases of NPI interpretations occurred, but there was no clear example of an FCI use. (23c) accordingly was classified as universal, although an FCI reading is possible: 'any Christian that longs for bliss'.

- (23) a. And for-þi leofemen **uwilc** **sunne-dei** is to locan alswa
and therefore dear people each Sunday is to look as
ester dei
Easter day
(CMLAMBX1,45.601) *universal*
'And therefore, dear men, **each Sunday** is to be observed as Easter Day'
- b. Hu magg icc ben wiþþ childe Wipputenn streon o
how can I be with child without begetting on
faderr hallf, Wipputenn **iwhille** **macche?**
father side without any partner
(CMORM,I,77.682) *NPI*
How can I be with child without begetting it on the father's side, without **any mate?**' (Thomas p34)

- c. & **iwhille** **an** **Cristene** **mann**, Patt georneþþ affterr blisse,
 & each/any one Christian person that yearns after bliss
 Birrþ standdenn inn affterr hiss miht To follghenn hire
 ought to continue after his power to follow her
 bisne, Swa þatt he mughe lendenn rihht Affterr
 example so that he may proceed right after
 hiss aghennwille Upp intill heofrennrices ærd, To brukenn
 his own will up until heaven's kingdom place to enjoy
 eche blisse.
 eternal bliss
 (CMORM,I,73.653) *universal (FCI possible)*
 'And **each Christian person who yearns for bliss** ought to continue, according
 to his ability, to follow her example so that he may proceed right, according to
 his own will, up into heaven's place to enjoy eternal bliss.' (Thomas p33)

- examples of complex forms (from *æfre ælc*) ((24c) is classified as universal (FCI possible) according to the criteria applied, although there is in fact some plausibility of an FCI reading, indicated as well by the choice of *whoever* in the translation):

- (24) a. Comen alle strikinde strengest te swiðest of
 came all striding strongest the swiftest of
eauer-euch strete for te here þis strif.
 every street for to hear this strife
 (CMKATHE,30.180) *universal*
 'Everyone came striding, the strongest and swiftest from **every single street**
 to hear this strife.'
- b. for he is leoflukest þing. & buten **eauer euch** **bruche**
 for he is loveliest thing & without **any** **?damage**
 (CMHALI,135.105) *NPI*
 'for he is the loveliest thing and without any breach,'
- c. Dies is swiðe beheue **æurilch** **mann** ðat æure
 this is very fitting (to) every man that ever
 i-boregen scal bien, þat he bie hersum gode,
 saved shall be that he be obedient (to) God
 and, for his luue, ðe biscope, and his prieste, and his louerde.
 and, for his love, the bishop and his priest and his lord
 (CMVICES1,109.1303) *universal (FCI possible)*
 'This is very profitable to **every man whoever will be saved**, that he be
 obedient to God, and, for His love, to the bishop, and to his priest, and to his
 lord.' (Holthausen p 104)

=> EME indeterminates going back to *ælc*, *gehwelc* and *æfre ælc* can be interpreted as universals, NPI and plausibly FCI, i.e. the interpretations available for the OE A-series.

=> positive evidence that the A-series system is still operative in EME.

=> evidence of OE's quantificational system still exists in EME.

- no evidence of the GE-series was found. Descendants of the old GE-series pronouns occurred (*iwilc, uwilc* etc), but **no existential occurrences** were found. All occurrences were in accordance with the A-series range of interpretations.

=> the evidence indicates loss of the GE-series - not in terms of morphological forms, but in terms of its place in the quantificational system - in EME.

- how did the **bare series of indeterminate pronouns** develop? The ambiguity of OE bare indeterminates is part of the motivation for the OE quantificational system. Are non-interrogative, i.e. quantificational readings of bare indeterminates still attested in EME?

- search of the same EME files as above (ME1 and MEx1 from the PPCME) for quantificational/non-interrogative uses of 'who/what' and 'which'. Again I searched for all forms of these words that I was aware of (*hwa, hwet, ho, wech* etc.).

- result: 19 hits with 19 occurrences (in a corpus of 258 080 words). Below: one occurrence from the Lambeth Homilies, one from Ancrene Riwe and one from the Kentish Homilies. The first example is some kind of universal, the other two are interpreted existentially.

(25) **Hwa** efre þenne ilokie wel þene sunne dei. oðer þa oðer halie
 who ever then look well the Sunday or the other holy
 da+ges þe mon beot in chirche to lokien swa þe sunne dei.
 days that one be in church to look like the Sunday
 (CMLAMBX1,47.609) *universal or FCI*

Let **each one** then always observe the Sunday, and the other holy days which in church we are commanded to keep like the Sunday, ... (Morris p46)

(26) Þear ase monie beoð igedered togederes, þer for anrednesse
 there as many are gathered together, there for unity
 me schal makie strengðe of annesse of claðes ant of **oðer hwet** of
 but shall make strength of oneness of clothes and of other stuff of
 utterere þinges, þet þe annesse wiðuten bitacni þe
 outward things, that the oneness without signifies the
 annesse of an luue ant of an wil þet heo alle habbeð imene wiðinnen.
 oneness of one love and of one will that they all have in common within
 (CMANCRIW-1,I.48.95)

There, however, where many are gathered together, they should, for the sake of unity, make a point of sameness of clothes and of **other outward things**, that the outward sameness may denote the sameness of one love and of one will, which they all have in common under their habit, ... (Savage & Watson) *existential*

(27) & gyf heo **hwæt lytles** habbeð gegylt, & gedon ongean
 & if she what small have sinned, & done against
 Godes wille, þt beo geclænsod & forgeofen þurh þære drohtnunge,
 God's will, that be cleansed & forgiven by that behaviour
 (CMKENTHO,142.206)
 'if she is guilty of **some little thing** ... ' *existential*

- parallel search in **late OE**: quantificational readings of *hwa* and *hwelc* and their various forms and spellings.

- files searched: the only two files clearly identified as OE4 (1050-1150); the files marked OE34 (MS from OE4, text from OE3); YCOE files not marked for time period with a MS date of 11th century med. or later, i.e. the MS is from OE4 (total word count 247 166) (see **Appendix A**).

- result: 176 hits for non-interrogative/quantificational bare indeterminates. Below is a comparison of late OE and EME in terms of number of quantificational bare indeterminates:

(28)		<i>hwa/who</i>	<i>hwelc/which</i>	total
	LOE	98	78	176
	EME	18	1	19

=> quantificational uses of bare indeterminates decline in number in EME.

- there may be also a decline in variety in the kind of quantificational use. The 13 Ancrene Riwe non-interrogative occurrences of *hwa/hwet*, with only one exception, consist of *hwet* combined with a quantity modifier, as in (29):

(29)	a.	other hwet	'other things'		
	b.	sum hwet	'something'		
	c.	moni hwet	'manifold';	hwet lyttles	'something small'

- the free use of bare indeterminates as quantificational expressions seems to see some combinatory limitations. The decline in number for *hwelc/which* - with only one relevant occurrence in EME - may also be an indication of such limitation.

- plus the uses in Ancrene Riwe are all existential - i.e. they have the reading that is compatible with such modification structures. (Interesting: the four occurrences in the Lambeth Homilies, all from the file *cmlambx1.mx1*, are diverse, more similar to what we have seen for OE.)

=> quantificational readings of the bare series, while still attested, are declining
- both in number and in variety.

=> the **OE quantificational system is reduced** in EME:

- All occurrences of non-bare indeterminates are in accordance with A-series analysis, which employs [u∇] and hence is incompatible with EXIST.
- the OE GE-series with its range of interpretations (which includes existential readings) is no longer in use, according to available evidence.
- there are still quantificational uses of bare indeterminate pronouns. But we see a substantial decline in frequency & variety of quantificational bare indeterminates.

3.2. Late ME (LME)

What we will see: LME is on the way towards a loss of the operator-trigger quantificational system, towards a direct association of a particular semantics with the former alternative trigger.

- the period ME4 (1420-1500) is contrasted with ME1. The PPCME includes 12 files from this period, with a combined word count of 260 116 (listed in **Appendix A**).

- A search for the same **non-bare forms** as in the EME investigation yielded 295 occurrences:

- (30) 295 total 240 occurrences of forms of *every* (*euery, eueri, every, euyrry, euyry*)
43 occurrences of forms of *each*
(*ech, eche, each, iche, ich*; also *ecchone, echone*)
12 complex forms
(e.g. *euerych, everyche, everych, eueryche, euyryche, euyreche*)

=> Forms of *every* are by far the most common of these expressions.
Forms of *each* are rarer, and recognizably complex forms are quite rare.

- two typical examples from 'The book of Margery Kempe':

- (31) a. but was labowrd wyth horrybyl temptacyons of lettherye & of dyspeyr ny al þe
next ger folwyng, saue owyr Lord of hys mercy, as sche seyde hir-self, gaf
hir **ech day** for þe most party too owerys of compunccon for hir synnys wyth
many byttyr teerys.
(CMKEMPE,16.325) *universal*
'... gave her each day for the most part two hours of compunccon for her sins ...'
b. & so he dede **euery day**.
(CMKEMPE,34.768) *universal*
'& so he did every day.'

- There were **no NPI uses** in this sample of 295 occurrences. If LME were like EME in terms of the interpretive range of these non-bare pronouns, we might have expected to find about 15 NPI uses in this LME data set, since in EME, roughly 5% of the occurrences were NPIs.

- All data are compatible with an interpretation of the occurrence as a universal quantifier. In some examples, an interpretation as an FCI is possible, as for instance in (32).

- (32) a. And sith this longith to **eche honest recluse**, gode sustir, and thou wilt be
Goddys owne derlynge, fle the homly communicacyoun of alle men but if it be
suche that ben assigned to the.
(CMAELR4,4.97) *universal, FCI possible*
'... this is fitting to each honest recluse ...'
b. He ordeyned þat **euery man** þat wold be Cristen mite be baptized, for nede, in
euery watir, flood, welle, or strem, so þat he mad confession of þe feith.
(CMCAPCHR,55.679) *universal, FCI possible*
'He ordered that every man that would be Christian might be baptized, of
necessity, in every water, flood, well, stream, ...'

- The first example is generic, the second contains a possibility modal. In both an FCI like PDE *any* would be licensed. It is possible that the ME expression is intended as such an FCI, but it is difficult to be certain.

- Perhaps this lack of certainty is the point: at some point, an ME language learner's input failed to contain data that required clearly an analysis as a polarity sensitive item. If all input data are compatible with an interpretation as a plain universal quantifier, this is the interpretation that will remain.

- I suggest that this stage is reached at some point after the loss of attested NPI uses, which indicate a polarity sensitive semantics more unambiguously than FCIs. This may be LME or soon after (it is not clear how to ascertain a definitive time).

- at that point (which is perhaps during or at the end of the LME period), the following picture of LME non-bare indeterminate pronouns presents itself:

(33) non-bare indeterminates require ALL:
non-bare indeterminate pronoun => ALL

=> Move towards a one-to-one correspondence of alternative trigger and operator, and no longer any ambiguity.

- search for quantificational uses of **bare indeterminates** in the same 12 LME files

- results: two hits for quantificational 'who' containing the set phrase 'as they say':

(34) a. **as ho saith**, hoo may atteyne to come to the vertu of chastite, take he it
(CMAELR4,9.234)
b. & compleyned to þe good wyfe of þe hows, seying in þis wyse, "Madam, my bone maryd ryng to Ihesu Crist, **as ho seyth**, it is a-wey."
(CMKEMPE,78.1771)

- There were no quantificational uses of 'who' other than this idiom.

- The automatic search for quantificational 'which' produced one hit containing *weche*:

(35) [...] Roberd Reynys of Acle made a covenaut with his ffader, Iohn Reynys, be his lyve, and bowte of hym his place in the market, [...]; also, another tenement clepyd Baronys, [...], with alle nessarys that ben rote-fast and nayle-fast, lyke as Iohn Reynys held it ffor the **weche** seyde place: gardeynys, closez, londes, tenementis, pytell, marsshes and rentis.
(CMREYNES,294.538)

'... as John Reynys held it for **the which said place**: ...'

- While the example is a little unclear, it is quite clear that this is not an existential or universal interpretation. This means that no quantificational uses of 'which' were found.

=> the LME files yielded **no quantificational interpretations of bare indeterminate pronouns** 'who' or 'which' (outside the idiom).

=> move towards a one-to-one correspondence of trigger and operator here as well:

(36) bare series requires Q (e.g. *ho[uWH]*, *Q[iWH]*)
bare => Q

- (37) **one-to-one correspondence:**
 former A-series: ech/euери \Leftrightarrow ALL
 former bare series: who/what \Leftrightarrow Q

\Rightarrow **Summary of LME:**

- bare series interrogative only, non-bare universal only
- no remnant of OE system (with its dissociation of triggers and operators)
- no motivation for alternative semantics of non-bare indeterminates

4. Conclusions and Outlook

4.1. Analyses of the ME stages

EME: all non-bare forms are [u \forall] and via universal agreement require one of the operators ALL, All-Alt, EXH, which are [i \forall].

- (38) a. **uwilc sunne-dei** is observed
 each Sunday is observed
 b. [[uwilc sunne-dei]] = {x: x is a Sunday} *Alternative trigger*
 c. [ALL[i \forall] [[uwilc sunne-dei][u \forall] is observed]]
 d. For all propositions p: $p \in \{\text{that } x \text{ is observed} \mid x \text{ is a Sunday}\} \rightarrow p \text{ is true}$

The bare series can be evaluated by Q, the question operator, and presumably still by EXIST (in constrained contexts), but perhaps no longer by ALL by an increasing number of EME speakers.

- (39) **change OE \rightarrow EME:** less ambiguity, feature system more prominent

LME: the forms *ech*, *euery*, *euerych* etc. are all [u \forall] and that only ALL is [i \forall]. All-Alt and EXH cease to be available as evaluating operators of these forms. Bare indeterminates in LME can be evaluated by the Q operator and nothing else. We can model this by associating exclusively *who*, *which* etc. with [uWH] and the Q operator with [iWH].

- (40) **change EME \rightarrow LME:** one-to-one correspondence of operator and trigger

For the universals, a simpler semantic derivation now becomes possible. Instead of postulating a covert operator ALL in the structure, rigidly associated with a morphological exponent, a LME or EModE speaker can posit a simpler structure without the operator, and associate the universal with a quantificational semantics directly.

- (41) a. [[_{DP} ech Sunday] is observed]
 b. [[ech]] = $\lambda P. \lambda Q. \forall x [P(x) \rightarrow Q(x)]$ *Generalized Quantifier*
 [[ech Sunday]] = $\lambda Q. \forall x [\text{Sunday}(x) \rightarrow Q(x)]$
 c. $\forall x [\text{Sunday}(x) \rightarrow \text{observed}(x)]$

The behaviour of bare indeterminates supports this change because bare indeterminates no longer provide evidence for ALL (or indeed EXIST, i.e. any covert alternative sensitive quantifier). I

conjecture that the change from (38) to (41) becomes possible towards the end of the ME period or soon after.

(42) **change towards ModE:** Generalized Quantifier semantics (Barwise & Cooper 1981)

4.2. The Universal Semantic Cycle USC

Zooming out: the diachronic development of universal quantification in English instantiates the USC (Beck (2017, 2020)).

(43) **Universal Semantic Cycle USC:**

- stage 1:** Universal quantification over alternative propositions in a question set
 $\forall p[p \in \wp_{\langle\langle s, t \rangle, t \rangle} \rightarrow \varphi(p)]$
- stage 2:** Direct universal quantification over alternatives
 $\forall z[z \in ALT_{\text{indet}} \rightarrow Q(z)]$
- stage 3:** Lexical universal quantification over individuals by universal DP
 $\forall x[P(x) \rightarrow Q(x)]$
- stage 4:** Group denoting DP with possible universal distributive readings
 $\max(\lambda x.*P(x)) \in [\lambda z.\forall x[x \leq z \rightarrow Q(x)]$

The cycle relates diverse ways of expressing universal quantification crosslinguistically. It proposes that they are stages in a diachronic cycle or spiral, akin to Jespersen's cycle for negation. Today's case study shows that there are indeed pathways of change relating its stages.

=> The ME case study led us from stage 2 to stage 3 of the USC.

Appendix A: Files searched

Late OE files from YCOE (Taylor et al. (2003)) searched for quantificational readings of bare indeterminates (file name, MS date, word count):

coadrian.o34	11th med.	1 092
coalcuin	12th med.	5 549
coaugust	12th med.	103
cocanedgX	11th 3rd quart.	248
cochrdrul	11th 3rd quart.	18 386
cochristoph	11th med.	1 426
cochronD	11th med.	26 691
cochronE.o34	12th-12th med.	40 641
codicts.o34	11/12-12th med	2 180
coeluc1	12th med.	1 512
coeluc2	12th med.	583
coexodusP	11th 3rd quart.	1 096
cogenesisC	11th med.	5 224
coherbar	11th	22 213
coinspolD.o34	11th ini.	2 530
coinspolX	11th 3rd quart.	4 896

cojames	12th med.	1 659
colawger.o34	11th/12th	751
colawwllad.o4	12th	220
coleafri.o4	12th	1 017
colsigewB	12th	3 665
colsigewZ.o34	11th	10 420
colwgeat	11th-12th med.	2 460
colwsigeT	11th 3rd quart.	319
colwsigeXa.o34	11th med.	3 336
comargaC.o34	12th	4 196
comargaT	11th med.	3 661
comart2	11th 3rd quart.	4 391
coneot	12th med.	2 003
conicodA	11th 3rd. -12th	8 197
conicodC	12th med.	4 629
conicodE	12th	1 588
coprefsolilo	12th med.	441
corood	12th	6 920
cosolilo	12th med.	15 856
cosolsat.ox4	12th med.	2 046
covinceB	12th	728
covinsal	11th 3rd quart.	3 655
cowulf.o34	'various'	28 768

MEX1 and ME1:

The PPCME-2 corpus (Kroch & Taylor (2000)) contains 14 files from ME1 or MEX1 with a word count of 62 596 (MEX1) plus 195 494 (ME1) words.

cmancriw-1.m1	48566	Ancrene Riwle	1230
cmancriw-2.m1	15224	Ancrene Riwle	1230
cmmarga.m1	8000 words	St Margaret (Katherine Group)	1225
cmjulia.m1	6810	St Juliana (Katherine Group)	1225
cmkathe.m1	8699	St Katherine (Katherine Group)	1225
cmhali.m1	8495	Hali Meidhad (Katherine Group)	1225
cmsawles.m1	4111	Sawles Warde (Katherine Group)	1225
cmkenthom1	4048	Kentish Homilies	a1150
cmlamb1.m1	6459	Lambeth Homilies	a1225
cmlambx1.mx1	20752	Lambeth Homilies	a1225
cmorm.m1	50579	Ormulum	1200
cmpeterb.m1	6757	Peterborough Chronicle	1150
cmtrinit.mx1	41844	Trinity Homilies	a1225
cmvices.m1	27677	Vices and Virtues	a1225

LME: The PPCME-2 corpus contains 12 files from ME4 with a word count of 260 116.

cmaelr4.m4	Aelred's De Institutione	a1450
cmcapchr.m4	Capgrave's Chronicle	a 1464
cmcapser.m4	Capgrave's Sermon	1452
cmedmund.m4	Life of St Edmund	1450
cmfitzja.m4	Fitzjames's Sermo die Lune	1495
cmgregor.m4	Gregory's Chronicle	1475
cminnoce.m4	In Die Innocencium	1497
cmkempe.m4 (60 000 words)	The book of Margery Kempe	1450
cmmalory.m4	Malory's Morte Darthur	a1470
cmreynar.m4	Caxton Reynard the Fox	1481
cmreynes.m4	Book of Robert Reynes	1470-1500
cmsiege.m4	The siege of Jerusalem	1500

Appendix B: Analyses

An **NPI analysis** preferred over wide scope universal:

$$(B1) \quad \neg \exists x[P(x)] \Leftrightarrow \forall x[\neg P(x)]$$

(B2) Forðæm hit is betere, [...], ðætte **ælc mon** adryge of
therefore it is better [...], that ÆLC man wipe off of
 oðerra monna mode ðone wenan be him **ælcas yfeles,**
other men's minds the supposition near him (of) ÆLC evil,
 (cocura,CP:59.451.22.3254)
 'Therefore it is better, [...], for **every man** to wipe away from the minds of others the **unfavourable opinion** of himself,' (Sweet) ('...the supposition of **any evil** in him ...')

- (B3) a. Voldemort wiped off their minds the supposition of *ælc* evil in him.
 = V brought it about that it is not the case that they suppose that *ælc* evil is in V.
 b. $\neg \forall w[w \in \text{BEL}(@)(\text{they}) \rightarrow \exists x[\text{evil}(w)(x) \ \& \ \text{in}(w)(x)(V)]]$
 'It is not the case that they believe that any evil is in V.'
 c. $\forall x[\text{evil}(@)(x) \rightarrow \neg \forall w[w \in \text{BEL}(@)(\text{they}) \rightarrow \text{in}(w)(x)(V)]]$
 'Each actual evil is such that they don't suspect V of it.' (@ is the actual world)

Quantification over alternatives:

- (B4) a. [OP [XP *hwa left*]]
 b. $[[hwa]]_o$ is undefined
 $[[hwa]]_{Alt} = \{x: x \in D\}$
 c. $[[hwa \ left]]_o$ is undefined
 $[[hwa \ left]]_{Alt} = \{\lambda w.x \ left_w \mid x \in D\}$

question: [Q [... indeterminate pronoun ...]
 |_____|

- (B5) a. $[[Q \ XP]]_o = [[XP]]_{Alt}$
 b. $[[Q \ hwa \ left]]_o = \{\lambda w.x \ left_w \mid x \in D\}$ (e.g. Hamblin (1973))

existential: [EXIST [... indeterminate pronoun ...]]
|_____|

- (B6) a. $\llbracket \text{EXIST XP} \rrbracket_o(w) = 1$ iff there is a $p \in \llbracket \text{XP} \rrbracket_{\text{Alt}}$: $p(w) = 1$ (K&S (2000))
b. $\llbracket \text{EXIST } hwa \text{ left} \rrbracket_o(w) = 1$ iff there is a $p \in \{\lambda w.x \text{ left}_w \mid x \in D\}$: $p(w) = 1$

universal: [ALL [... indeterminate pronoun ...]]
|_____|

- (B7) a. $\llbracket \text{ALL XP} \rrbracket_o(w) = 1$ iff for all $p \in \llbracket \text{XP} \rrbracket_{\text{Alt}}$: $p(w) = 1$ (K&S (2000))
b. $\llbracket \text{ALL } hwa \text{ left} \rrbracket_o(w) = 1$ iff for all $p \in \{\lambda w.x \text{ left}_w \mid x \in D\}$: $p(w) = 1$

NPI: [EXH [... indeterminate pronoun ...]] (e.g. Krifka (1995))
|_____|

- (B8) $\llbracket \text{EXH ZP} \rrbracket_o(w) = 1$ iff $\llbracket \text{ZP} \rrbracket_o(w) = 1$ and for all $q \in \llbracket \text{ZP} \rrbracket_{\text{Alt}}$: $(\llbracket \text{ZP} \rrbracket_o \neq q) \rightarrow q(w) = 0$

FCI: [All-Alt [... indeterminate pronoun ...]] (e.g. Menendez-B. (2010))
|_____|

- (B9) $\llbracket \text{All-Alt}_R \text{ XP} \rrbracket_o(w) = 1$ iff for all p such that $p \in \llbracket \text{XP} \rrbracket_{\text{Alt}}$:
for all w' such that $R(w')(w)$, $p(w') = 1$

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Selected Digital Resources:

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- Taylor, Ann, Anthony Warner, Susan Pintzuk & Frank Beths (2003). *The York-Toronto-Helsinki Parsed Corpus of Old English Prose*.
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