

Quantificational Variability and the Genesis of English Headed *Wh*-relatives

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Sinn und Bedeutung, 16/9/14

Section 1

Introduction

Desiderata

- ▶ A good theory of change tends to avoid outlandish diachronic leaps.
- ▶ This is just as true in semantics as in phonology or syntax.
- ▶ This is especially true of recurring changes.
- ▶ Recurring changes should look incremental and natural.
- ▶ If they don't, we should worry.

Ideas from syntactic change

- ▶ Reanalysis (e.g. Lightfoot 1979):
 1. A learner associates a new structure with a given string.
 2. The learner uses that new structure in previously impossible ways.
- ▶ An unobservable structural change is logically prior to the observable consequences.
- ▶ The unobservable change can be quite large; the observable consequences must not.

Reanalysis in semantic change

- ▶ Two meaning representations can be truth-conditionally indistinguishable.
- ▶ So Lightfoot's logic is equally applicable to semantics.
 - ▶ A learner may pair a truth-conditionally old interpretation with a compositionally new semantic representation.
 - ▶ That new representation may then be reusable in novel interpretations.
- ▶ (Presupposes a theory where semantic representations are not just about truth-conditions).

Today

- ▶ Middle English headed *wh*-relatives developed out of Old English free *hw*-relatives.
- ▶ This has syntactic and semantic aspects.
 - ▶ Syntactic: distribution of *wh*-clauses.
 - ▶ Semantic: compositional mechanisms for incorporating *wh*-clauses into larger environment.
- ▶ This development has recurred throughout Indo-European: Proto-Indo-European probably did not use interrogative $k^w i$ -/ $k^w o$ -forms in headed relatives (Clackson 2007), but surprisingly many modern IE languages do.

	IE	Other
Headed <i>wh</i> -RC	19	3
No headed <i>wh</i> -RC	21	129

Table 1 : Summary of languages in De Vries (2002)

Today

- ▶ Many traditional accounts associate the free relatives with “indefinite” (universal) interpretations and the headed relatives with definite interpretations — a fairly large change.
- ▶ Recent advances in the semantics of free relatives bring the two interpretations closer.
- ▶ We identify an ambiguous context, and a semantic reanalysis driving the emergence of headed *wh*-relatives.

Roadmap

1. The diachrony of English relatives: Classical accounts
2. Formal semantics of free relatives
3. Back to Old English
4. Conclusions

Section 2

The diachrony of English relatives: Classical
accounts

Old English headed relatives

- ▶ OE could form headed relatives in $2 \times 2 = 4$ ways:
 - ▶ With or without a relative complementizer *ðe*
 - ▶ With or without an inflected demonstrative phrase as relative specifier (e.g. Allen 1980).

- (1) a. he is ure lif [*on þam* we lybbað & styriað __]
he is our life in DEM we live and move
“He is our life, in whom we live and move”
- b. ic [*ðe* __ to eow sprece]
I that to you speak
“I, that speaks to you” (both Ælfric homilies)

Hw-phrases in Old English

► OE *hw*-phrases had three uses:

1. Indefinites (NPIs?)

- (2) and gif **hwa** hyt bletsað, þonne ablinð seo dydrung.
and if who it blesses then ceases DEM illusion
“And if anyone blesses it, then the illusion is dispelled”

2. Interrogative forms

- (3) Saga me on **hwilcne dæg** he gesingode
Say me on which day he sang
“Tell me which day he sang on”

3. In free relatives

- (4) [eal swa **hwæt** swa ic þe gehet] [eal ic hit gesette]
all so what so I thee promised all I it appoint
“Whatever I promised you, I will do it all”

Overlap with headed *wh*-relatives

- ▶ Ambiguous context: free relatives in apposition (typically to *eall*) / nonrestrictive headed relatives.
 “*swa hwæt swa*, having *eall* for its antecedent was on a fair way to become a definite relative.” (Johnsen 1913:300)
- ▶ OE free *hw*-relatives occur almost exclusively in peripheral positions (left-dislocated, or clause-final).
- ▶ Early headed *wh*-relatives are exclusively clause-final (often extraposed).
- ▶ So clause-final free relatives overlap with extraposed headed relatives.

Internal syntax of free *hw*-relatives

- ▶ OE free *hw*-relatives typically have the form *swa hw... swa*.
- ▶ *hw...* can be a single word, or an NP. If an NP, the second *swa* comes immediately after the whole NP.
- ▶ Prepositions precede the first *swa*.

(5) [CP [PP on [NP swa hwylcen dæige]] [C swa] se
on so which day so the
synfulle gecerred byð to Gode]
sinful turned is to God
“On whichever day the sinner is turned to God”
(coalcuin,Alc_[Warn_35]:393.290)

Diachrony: Syntax

- ▶ In late OE/early ME, simple “erosion” made the baroque OE free *hw*-relative look much more like a modern *wh*-relative.
 - ▶ The first *swa* was increasingly omitted.
 - ▶ The second *swa* was increasingly in alternation with *ðe/as/∅*.
- ▶ A series of incremental changes led to the introduction of headed *wh*-relatives.

OE:	[[<i>swa hw swa</i> ...] ...]	Left-dislocated free relative
OE:	[... [<i>swa hw swa</i> ...]]	Clause-final free relative
Late OE:	[... [<i>hw swa</i> ...]]	Clause-final, no initial <i>swa</i>
Late OE:	[... [<i>hw ðe/∅</i> ...]]	Clause-final, no <i>swa</i>
Late OE?:	[... NP _{<i>i</i>} [<i>hw</i> ...] _{<i>i</i>}]	Clause-final, in apposition
Early ME:	[... [NP [<i>hw</i> ...]]]	Extrapolated headed relative
ME:	[... [NP [<i>hw</i> ...]] ...]	Embedded headed relative

- ▶ At issue: Semantic changes to match the syntactic changes.
- ▶ Surely more than “indefinite/interrogative/generalizing → definite”.

Curme on free relative semantics

‘This change of meaning from a general conception to a particular reference must have been made more easy by the use of “seþe” with the general meaning *he that, whoever*: “Seþe gelyfþ on me, he wyrçþ þa wearc þe ic wyrce” (John 14.12, Corpus) “He that believes on me (he) will do the works that I do.” The relative “seþe,” which usually follows an antecedent, and thus refers to a definite individual, here stands at the beginning of the sentence just as the general relative “swa hwylc swa” and like it has a general meaning. Thus the same form has a general and a particular meaning. Similarly the general relative “swa hwylc swa” passed from the head of the sentence to a position after a definite antecedent and took on definite meaning, for after the analogy of “seþe” it could have both general and definite force. . . [T]he meaning of “swa hwylc swa” and “seþe” or “se” was identical[.]’ (Curme 1912:196)

Themes from Curme

1. D-elements (determiners, pronouns) slip back and forth between multiple meanings.
 2. This is quite common (at least, *se*-forms do it as well as *hw*-forms).
 3. Position in the clause determines interpretation as well as pronoun/determiner choice.
 4. Different D-series *se*, *hw* can have similar (maybe identical) interpretations in certain positions.
- Some of this is reminiscent of recent semantic analyses of free relatives.

Section 3

Formal semantics of free relatives

Free *wh-ever*-relatives: Definite or universal?

- ▶ Consensus view: free relatives as in (6) are definite descriptions.

(6) I ate what he cooked (= the thing(s) that he cooked)

- ▶ Under debate: are *-ever*-free relatives definite or universal?
Commonsense answer: they're universal.

(7) I ate whatever he cooked (= everything that he cooked)

This is more or less the traditional answer ((7) is an “indefinite relative”). See also Larson (1987), Iatridou & Varlokosta (1998).

Free relatives as uniformly definite

- ▶ Jacobson (1995) argued that both varieties of free relatives are definite descriptions.
- ▶ Universal interpretations can be doubly dissociated from *-ever*.
- ▶ *-ever*-FRs can function as definite descriptions.

(8) Everyone who went to whatever movie the Avon is now showing said it was very boring. (Jacobson 1995:454)

- ▶ Non-*-ever*-FRs can function as universals.

(9) Do what the babysitter tells you (Jacobson 1995:455)

- ▶ Assume a lattice structure for D_e à la Link (1983).
- ▶ If $\llbracket IP \rrbracket^w = \lambda x. P(x)(w)$, *what(ever) IP* denotes the unique maximal entity X such that $\llbracket IP \rrbracket^w(X) = 1$.

Genericity and apparent quantificational force

- ▶ Dayal (1997): a key determinant of “definite” vs. “universal” interpretation of FRs is episodic vs. generic interpretation.

(10) a. Do what the babysitter told you.

b. Do what the babysitter tells you.

(11) a. Everyone who went to whatever movie the Avon was showing said it was very boring.

b. Everyone who goes to whatever movie the Avon is showing says it is very boring.

- ▶ Generic quantification over situations + an interpretation of FRs as maximal entities bearing some property in those situations → quasi-universal interpretation of FRs without a universal interpretation of the *wh*-phrase.

The contribution of *-ever*

- ▶ von Fintel (2000): *-ever* adds a presupposition that the relevant predicates would continue to hold of the referent of the free relative, regardless of the identity of that referent.

(12) $whatever(w)(F)(P)(Q)$

a. presupposes:

$$\forall w' \in \min_w [F \cap (\lambda w'. \iota x. P(w')(x) \neq \iota x. P(w)(x))] : \\ Q(w')(\iota x. P(w')(x)) = Q(w)(\iota x. P(w)(x))$$

b. asserts: $Q(w)(\iota x. P(w)(x))$ (von Fintel 2000)

Where w is a variable over worlds, F is a modal base, P is the free relative denotation, Q is the predicate of which the free relative is an argument.

- ▶ Presupposition in plainer English: if the maximal individual bearing P had been different, Q would still have held of that individual.

Section 4

Back to Old English

How formal semantics can help

- ▶ Major implications of the above: free relatives are definite descriptions, even when they behave like universals and have quasi-universal interpretations.
- ▶ This is not a quirk of Present-Day English: the semantics of free relatives is fairly stable across languages (Caponigro 2003).
- ▶ Apparent variable interpretations are determined by modal base and the episodic vs. generic distinction, among other factors. They aren't related to the semantics of the *wh*-element itself.
- ▶ So, in seeking to explain the emergence of headed *wh*-relatives, we should focus less on the semantics of the *wh*-phrase and more on contextual factors influencing the interpretation.

Study design

- ▶ Trawl York–Toronto–Helsinki Corpus of Old English Prose (YCOE, Taylor et al. 2003) for free *wh*-relatives.
- ▶ Classified according to:
 - ▶ Position (left-dislocated, clause-final);
 - ▶ Tense of main verbs in free relative and matrix (past, present, ambiguous/other);
 - ▶ Internal composition of free relative (presence/absence of *swa*, argumental/adverbial *hw*-phrase).
- ▶ (Today, only adverbials discussed are locative; work in progress to extend this to temporal expressions, etc.)
- ▶ Robust correlations between the above suggest that position and internal structure restrict available interpretations.

Present tense as proxy for genericity

- ▶ Corpora don't mark generic interpretation, but they do mark tense.
- ▶ Reasonable to expect a correlation between present tense and non-episodic interpretation in this corpus.
 - ▶ Regardless of whether this was generally true in OE, it appears accurate for this particular corpus, where episodic here-and-now reports are almost completely absent.
- ▶ By hypothesis, because present tense FRs tend to be interpreted as generic, they tend to have quasi-universal interpretations.

Free relatives and present tense

- ▶ Baseline: 89,027 present tense verbs in YCOE (44.4%), vs. 111,545 past tense (55.6%), 33,967 “other” verbs (ambiguous, imperative, etc.) excluded.

	Argument	Adverbial
LD	83% (199/240)	58% (19/33)
Final	63% (98/156)	42% (8/19)

Table 2 : Present tense in free *hw*-relatives

- ▶ Free *hw*-relatives strongly favour present tense (binomial test, $p \approx 0$).
- ▶ Within the set of free *hw*-relatives, logistic regression tells us:
 - ▶ Left-dislocation significantly favours present tense ($p = 3 \times 10^{-7}$)
 - ▶ Adverbial function significantly disfavors present tense ($p = 9 \times 10^{-4}$)
 - ▶ There is no interaction ($p = 0.35$).

The role of *swa*

- ▶ LD free relatives are much more likely than clause-final FRs to have *swa*... *swa* (logistic regression, $p \approx 0$).
- ▶ No significant effect of grammatical function ($p = 0.78$), no interaction ($p = 0.58$).

	Argument	Adverbial
LD	96% (228/237)	94% (30/32)
Final	68% (106/156)	68% (13/19)

Table 3 : *swa*... *swa* in free *hw*-relatives

- ▶ *Swa hw*... *swa* mainly gives rise to quasi-universal interpretations, with a few apparent counterexamples.
- ▶ All bare *hw*-free relatives appear to have definite interpretations.
- ▶ With just a handful of counterexamples, *swa* behaves like the OE version of *-ever*.

Examples: Left-dislocation, argumental

- (13) [[*Swa hwylc eower*] *swa* [*næfð* nane synne on
So which you.GEN.PL so NEG.have no sin in
him]]], *awyrpe* se ærest ænne stan on hy
him, cast.out.SBJ the first one stone on her
“He that is without sin among you, let him first cast a
stone at her” (coaelhom,+AHom_14:214.2117)

- ▶ *Swa hw. . . swa.*
- ▶ Present tense in FR and matrix.
- ▶ Quasi-universal interpretation.

Examples: Left-dislocation, adverbial

- (14) Soðlice [[**swa hwar**] **swa** [Israhela bearn **wæron**]], þar
Truly so where so Israel's children were, there
wæs leoht.
was light
“all the children of Israel had light in their dwellings”
(cootest, Exod:10.23.2788)

- ▶ *Swa hw. . . swa.*
- ▶ Past tense in FR and matrix.
- ▶ Still quasi-universal.

Left-dislocation: Discussion

- ▶ All OE left-dislocated FRs, whether argumental or adverbial, arguably have quasi-universal interpretations.
- ▶ The matrix predicates are also unusually non-episodic: 85% of the clauses to which an LD free relative attaches are in the present tense.
- ▶ Conclusion: LD free relatives are not representative of free relatives in general: whatever makes them favour the present tense also presumably makes them favour quasi-universal interpretations.

Examples: Clause-final, argumental, quasi-universal

- (15) Gap to losepe & doþ [[*swa hwæt*] *swa* [he eow
Go to Joseph and do so what so he you.DAT
secge]].
say.SBJ
“Go unto Joseph; what he saith to you, do.”
(cootest, Gen:41.55.1711)

- ▶ *Swa hw. . . swa.*
- ▶ Imperative in FR and matrix.
- ▶ Quasi-universal (*cf.* Jacobson's *do what(ever) the babysitter tells you*).

Examples: Clause-final, argumental, definite

- (16) eow weorþeth forgifen on þa sylfan tide [[hwæt]
 you.DAT is forgiven in the very time what
 [ge sprecaþ]].
 you speak
 “You are forgiven at this very time for what you say”
 (coblick,LS_32_[PeterandPaul[BiHom_15]]:171.10.2161)

- ▶ Bare *hw*-phrase.
- ▶ Present tense in matrix and FR, but apparently episodic.
- ▶ Apparently definite.

Examples: Clause-final, adverbial, quasi-universal

- (17) Ac we beop mid þe [[*swa hwyder*] *swa* [þu færest].
But we are with you so whither so you go
“But we are with you wherever you go”
(coblick,LS_1.2_[AndrewMor[BlHom_19]]:233.97.2997)

- ▶ *Swa hw... swa.*
- ▶ Present tense in FR and matrix.
- ▶ Quasi-universal.

Examples: Clause-final, adverbial, definite

- (18) þa cwæð ic to him, æteowe me [þa byrigeles [hwar ic þe leigde]].

Then said I to him show me the tomb where I you laid
“Then I said to him, ‘Show me the tomb where I laid you’.”

Se Hælend me þa beo þære rihthand genam and me
The Saviour me then by the right hand took and me
ut lædde [hwar ic hine byrede]
out led where I him buried

“The Saviour then took me by the right hand and led me
out to where I buried him” (*Gospel of Nicodemus*)

Examples: Clause-final, adverbial, definite

- (19) and þæt leoht geswutelode [[*swa hwær*] *swa* [hi lagon]].
 and that light showed so where so they lay.
 “And that light showed where they lay”
 (coaelive,+ALS[Forty_Soldiers]:271.2662)

- ▶ Past tense in FR and matrix.
- ▶ Clear definite interpretations.
- ▶ Only (18) is a bare *hw*-phrase; (19) with *swa*... *swa* is an apparent counterexample.

Summary

(20) [CP [FR [... hw...] [C] ...] ...]

a. Left-dislocated.

b.

c.

d.

(21) [CP ... [FR [... hw...] [C] ...]]

a. Clause-final.

b.

c.

d.

Summary

(20) [CP [FR [swa hw...] [C swa] ...] ...]

- a. Left-dislocated.
- b. Obligatory *swa*... *swa*.
- c.
- d.

(21) [CP ... [FR [swa/∅ hw...] [C swa/∅] [IP ...]]]

- a. Clause-final.
- b. Optional *swa*... *swa*.
- c.
- d.

Summary

(20) [CP [FR **swa** hw...] [C **swa**] ... [I **PRES**...] ... [I **PRES**] ...]

- a. Left-dislocated.
- b. Obligatory *swa*... *swa*.
- c. Typically present tense in FR and matrix.
- d.

(21) [CP ... [I]...[FR [**swa/∅** hw...] [C**swa/∅**] [IP ... [I]]] ...]

- a. Clause-final.
- b. Optional *swa*... *swa*.
- c. Present tense not particularly favoured.
- d.

Summary

(20) [CP [FR [*swa* hw...] [C *swa*] ... [I *PRES*]...] ... [I *PRES*] ...]

- a. Left-dislocated.
- b. Obligatory *swa*... *swa*.
- c. Typically present tense in FR and matrix.
- d. Generic, quasi-universal interpretation.

(21) [CP ... [I]... [FR [*swa*/∅ hw...] [C*swa*/∅] [IP ... [I]] ...]]

- a. Clause-final.
- b. Optional *swa*... *swa*.
- c. Present tense not particularly favoured.
- d. Generic or episodic, definite or quasi-universal, conditioned by presence/absence of *swa*... *swa*.

Exceptions and nonexceptions

- ▶ Correlations between tense, genericity, and interpretation of FR are of course far from perfect.
- ▶ Surprisingly, ignoring those imperfections gives a fairly clear picture.
- ▶ Removing the imperfections would doubtless sharpen things further. Other factors disfavoured episodic interpretations:
 - ▶ Explicit quantification outside FR.
 - ▶ Subjunctive and other markers.
- ▶ Future research must involve moving beyond the low-hanging fruit that can be automatically counted, but we expect this to remove noise rather than add problems.

Other quasi-universal markers

- (22) Ond he sona ðurhferde **eall** Breotone ealond, [swa
and he soon through.travelled all Britain's island so
hwyder ymb swa Ongolþeode drohtedon & wunedon]
whither about so Englishmen dwelled and lived
“And he immediately travelled through all of Britain,
wherever Englishmen dwelled and lived”
(cobede,4:2.258.5.2621)
- (23) & do þonne on þæt hors, oððe on [swa hwylc neat
and do then on that horse or on so which animal
swa hit **sie**]
so it be
“and do [put holy water] on that horse, or whichever
animal it may be”
(colacnu,118.1.578)

Section 5

Conclusions

What we get from FRs

- ▶ The first headed *wh*-relatives were clause-final (often extraposed) and adverbial.
- ▶ Clause-final adverbial FRs are independently most likely to have definite interpretations.
- ▶ The first headed *wh*-relatives were nonrestrictive.
- ▶ Even in the fine details, clause-final free relatives are clear precursors to headed *wh*-relatives.

(24) þæt se ungesewena wulf infær ne gemete,
 that the unseen wolf entrance NE find
[hwanon he in to Godes eowde cume & þær
 whence he in to God's herd come.SBJ and there
ænig scep of abrede]
any sheep off snatch
“that the unseen wolf may not find an entrance from
where he might come into God's herd and snatch any
sheep” (cochdrul, ChrodR_1:11.1.232)

The need for small changes

- ▶ An outlandish change in the meaning of *wh*-phrases could have happened by some fluke.
- ▶ But all over Indo-European, languages develop in parallel ways to English.
- ▶ De Vries (2002) showed that 19/40 IE languages in his sample have innovated headed relatives with interrogative forms in [Spec,CP]. Lightning doesn't strike 19 times in similar-looking places.
- ▶ So the changes leading to the emergence of headed *wh*-relatives must be natural.
- ▶ But they mustn't be trivial: 21/40 IE languages **didn't** develop such a construction.

So what changed?

- ▶ Johnsen (1913): clause-final free relatives in apposition are “on a fair way to become” clause-final nonrestrictive headed relatives.

(25) a. I arrived in London, [_{FR} where I stayed the night].

≈ . . . , the place where I stayed the night

b. $arrive(I, London) + \sigma x.(stay(I, night, x))$

(26) a. I arrived in [London, [_{HR} where I stayed the

night]]. ≈ “by the way, I stayed the night there”

b. $arrive(I, London) \bullet (stay(I, night, x))$

- ▶ Both built around the same property $\lambda x.stay(I, night, x)$.
- ▶ FR treats that property as characterizing an individual (Jacobson 1995); HR treats it as the core of a backgrounded proposition (e.g. Potts 2005).
- ▶ Certainly no difference in at-issue propositional content. Any interpretive consequences at all?
- ▶ An environment clearly amenable to semantic reanalysis.

Conclusion

- ▶ Free *wh*-relatives repeatedly evolve into headed *wh*-relatives.
- ▶ This change is not automatic.
- ▶ So the analysis must be natural, but not trivial.
- ▶ We have identified:
 1. An ambiguous context (clause-final *wh*-relatives) which could feed semantic reanalysis;
 2. Distinctive semantic properties of free *wh*-relatives in that position (especially with respect to definiteness);
 3. Small changes in syntactic structure and compositional semantics feeding the change.

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