

The Proto-Indo-European Negative Polarity Item **k^wené*

VALÉRIE JEFFCOTT

LOGAN NEESON

Universität Leipzig

Montréal, Québec, Canada

PIE **k^wené* has long been reconstructed as the proto-form corresponding to Sanskrit. *caná* and the indefinite-forming suffixes OE *-gen*, OHG *-gin*, OS *-gin*, Goth. *-hun*, and ON *-g(v)i* (Kieckers 1928; Gotō 2013; Briceño Villalobos 2019), but its precise denotation has not been established. We reconstruct PIE **k^wené* as a negative polarity item, and we propose a semantic analysis to account for its interpretation and distribution, after the scope theory of NPI licensing developed in Crnič (2011) and Ladusaw (1979), among others. We base our analysis on a survey of attestations of *caná* in the Rigveda, and of its cognates in Germanic, including previously unremarked-upon attestations in the (OE) Hatton Gospels. Our proposal is that **k^wené* comprises two operators, EVEN and AT LEAST, which both associate with a single focused element in their scope and induce contradictory implicatures in positive episodic contexts. This analysis correctly derives the distribution and meaning of the reflexes of this item in both branches. The proposal contributes to the reconstruction of the PIE indefinite system and makes predictions about the interpretations of certain problematic passages in the OE and Rigvedic corpora.

1 Introduction

Data from early Indo-Aryan and early Germanic languages evinces a Proto-Indo-European (PIE) form **k^wené* (Kieckers 1928:150–1; Gotō 2013:73–4; Briceño Villalobos 2019: 145–6). The reflexes of this form, Vedic Sanskrit *caná*, Avestan *cinā*, Old English (OE) *-gen*, Old High German (OHG) *-gin*, Old Saxon (OS) *-gin*, Gothic *-hun*, and Old Norse (ON) *-g(v)i*, typically combine with some other element to form a unit which is interpreted as an indefinite, often a negative indefinite. We propose that in PIE, or at least the most recent common ancestor of Germanic and Indo-Aryan, **k^wené* was in fact a negative polarity item (NPI). We further adopt from Crnič (2011) a semantic denotation which accounts for the item's distribution without any other lexically-specific machinery in the languages that preserve the reconstructed proto-meaning.

1.1 Negative polarity items

The characteristic distribution of NPIs has been linked since Ladusaw (1979) to the formal semantic property of *monotonicity*. A semantic context is *upwardly monotonic* or *upward entailing* if replacing any element in it with a superset of that element results in an equivalent expression. This is the case for typical positive episodic statements as in (1). Negation inverts scalar inferences in its scope, resulting in *downward monotonicity* or *downward entailment* (DE) when it occurs in an upward entailing context as in (2). The restriction of a universal quantifier is also a DE environment (3); from this fact it also follows that the restriction of a conditional will be DE (4) (Lahiri 1998:69–70, Liu 2010), as will the restriction of a superlative (5).

- (1) a. Annie is eating spinach. → Annie is eating greens.
 b. Annie is eating spinach ... {*ever, *at all, *either}.
- (2) a. Bill doesn't [eat meat]. → Bill doesn't [eat pork].
 b. Bill doesn't (ever) eat {any, the slightest bit of} meat (at all).
- (3) a. Everyone likes Talking Heads → Everyone with {any/the least bit of} taste (at all) likes Talking Heads.
 b. $\forall x[[\text{person}]](x) \rightarrow [[\text{likes Talking Heads}]](x)$ ¹
- (4) a. If you eat that, you'll get sick. → If you eat that before riding the Tilt-a-Whirl, you'll get sick.
 b. $\forall w[[\text{you eat that}]](w) \rightarrow [[\text{you get sick}]](w)$ ²
- (5) a. (Context: Annie is a basketball player.) Annie is the tallest athlete → Annie is the tallest basketball player.
 b. $[[\text{Annie is the tallest basketball player}]] = \forall x([[\text{basketball player}]](x) \wedge x \neq \text{Annie}) \rightarrow \text{Annie} >_{\text{height}} x \wedge [[\text{basketball player}]](\text{Annie})$

1 Double or white brackets $[[\]]$ are shorthand for the interpretation function which maps syntactic objects to semantic denotations.

2 We assume a Kripkean possible-worlds account of modal and conditional semantics, as is standard in formal semantics. (Kripke 1963, Stalnaker 1968, Menzel 2013). w represents a variable over worlds. For concision, we leave worlds implicit where their inclusion in an expression is trivial, i.e., where all functions that take worlds as arguments are saturated by the same world variable.

Questions are also known to license NPIs, but since they lack propositional content and therefore entailments, they cannot possibly be DE. In the tradition of Hamblin (1973), questions are modelled as sets of possible answers (“alternative sets”), as in (6) and (7). In this model, an NPI embedded in (an upward entailing context in) a polar question yields only one well-formed alternative (8). Since one alternative is still acceptable, such a question itself is well-formed, but it indicates that the speaker presupposes a particular (negative) answer (Guerzoni 2004; Crnič 2011:114–6).

- (6) $\llbracket \text{Who went?} \rrbracket = \{ \llbracket \text{went} \rrbracket(\text{Annie}), \llbracket \text{went} \rrbracket(\text{Bill}), \llbracket \text{went} \rrbracket(\text{Annie} \wedge \text{Bill}), \dots \}$
- (7) $\llbracket \text{Did Connie go?} \rrbracket = \{ \llbracket \text{went} \rrbracket(\text{Connie}), \neg \llbracket \text{went} \rrbracket(\text{Connie}) \}$
- (8) $\llbracket \text{Does Dale practice anymore?} \rrbracket = \{ \llbracket \text{Dale doesn't practice anymore} \rrbracket, \# \llbracket \text{Dale practices anymore} \rrbracket \}$

The criterial property of NPIs is that they are licit under negation and illicit in positive episodic contexts, though a variety of distributional sub-types have been identified (van der Wouden 1997:64–145; Hoeksema 2012). These sub-types are often denominated and ordered in terms of *strength*, referring to the degree of semantic similarity to negation that a given item has, or requires for licensing. The strongest NPIs are those which are acceptable only under negation (van der Wouden 1997:93–145).

Many accounts of NPIs treat their distribution as fundamentally syntactically-mediated, usually by agreement (e.g., Jäger 2010). The unifying assumption of these approaches is that the syntactic features which participate in the polarity system are intrinsic to the semantics of the licensers, but extrinsic (i.e., lexically specified) for the licensees (van der Wouden 1997:69–72). That is, the contexts which license NPIs all have some semantic property in common, while the NPIs themselves must individually be assigned by observation to the distributional classes corresponding to the contexts characterized by those semantic properties. These approaches have so far been more descriptively adequate than purely semantic approaches because the latter struggle to account for differences in behavior between superficially synonymous lexical items (van der Wouden 1997:69–72). But there is a great deal of evidence suggesting that the semantic properties of lexical items are strongly correlated with their polarity-sensitive behavior, even as the conditioning factors are more complex than the semantic categories proposed so far (Hoeksema 2012). A theory that captured these correlations would therefore be more explanatorily adequate than a syntactic account if it could attain the same descriptive coverage.

1.2 Differential diagnosis

Weak NPI indefinites such as *any* and (we argue) **k^wené* must be distinguished from ordinary negative indefinites as well as items that participate in negative spread. Negative indefinites like (Standard English) *none* semantically contribute negative existential quantification and are not necessarily polarity sensitive. In negative spread languages, a class of indefinites termed “N-words” exhibit a semantic polarity alternation depending on their syntactic environment (Giannakidou and Zeijlstra 2017:2111). These N-words are interpreted as positive indefinites when they scope under negation or another N-word, and as negative indefinites otherwise, including in isolation (e.g., as fragment answers; *ibid.* 2106). In “non-strict” negative concord (NC) languages, N-words in postverbal³ positions must be licensed by sentential negation or a higher N-word and interpreted as positive (*ibid.* 2108, 11).⁴ In these contexts their distribution is very similar to NPI indefinites like our reconstructed **k^wené*. They differ in that weak NPIs like *any* and **k^wené* can occur in (certain) non-negative contexts without a negative interpretation. We will not commit to any particular analysis of negative spread or negative concord among those proposed in the literature; it suffices for our purposes to note it suffices for our purposes to note these differences in distribution and semantics.

2 Distribution of **k^wené* reflexes in early Indo-European

Table 1. Number of attestations considered by language

Old Norse (<i>Poetic Edda, Prose Edda</i>)	> 300
Gothic (<i>Wulfila, Skeireins</i>)	104
Old Saxon (<i>Heliand</i>)	14
Old High German (<i>Evangelienbuch</i>)	12
Old English (<i>Beowulf, Hatton MS 38, Royal MS 1.A.XIV</i>)	7
Vedic Sanskrit (<i>Rigveda, Atharvaveda, Aitareya Brahmana, Chandogya Upanishad</i>)	137
Old Avestan (<i>Gathas</i>)	1

- 3 The terms “preverbal” and “postverbal” used in the literature are pre-theoretical, in that they refer to linear strings rather than syntactic structure. The non-strict negative concord languages discussed by Giannakidou and Zeijlstra (2017) all have V-to-T movement in finite clauses (Biberauer and Roberts 2008), so we assume the relevant distinction to be “above T” and “below T”.
- 4 In “strict” varieties of negative concord, N-words can serve as negative fragment answers but don’t trigger or undergo negative spread.

2.1 Distribution of *k^wené reflexes in early Germanic

For Proto-Germanic we reconstruct a particle or enclitic *γ^wen. PIE *k^w became *γ^w by Verner's law, fed by retraction of the accent due to apocope (Ringe 2017:142).

2.1.1 Old Norse

In ON, *γ^wen yields -g(v)i,⁵ an enclitic or suffix which forms N-words (Kieckers 1928:151; see §1.2). The most prevalent of these, *eingi*- 'none, nothing, no one' < *ein* 'one' + -gi, is used as a negative adverb 'not' already in the *Poetic Edda* (9), though the inherited negator *né* 'not, nor' is also still attested ((10); van Gelderen 2008:205–7). In a typical case of the first stage of Jespersen's cycle, *eingi*- was used as a minimizing adverb before being reinterpreted as a negative marker in its own right (ibid.:197–8). We presume the other NPI indefinites in -gi (e.g., *aldrigi* 'never', *hvergi* 'no one') were reinterpreted as N-words at the same stage. These items also participate in negative spread with one another (12), but probably not negative concord, since they are attested postverbally with negative meaning and no negative antecedent (13).

- (9) *eigi em ek haftr*

I am not bound. (*Fáfnismál* 8, van Gelderen 2008:207)

- (10) *er hjör né rýðr*

that do not redden a sword (*Fáfnismál* 24, van Gelderen 2008:206)

- (11) *var-at þat vín né vatn / mjöðr né mungát / né matar ekki*

It was not wine nor water, mead nor ale, nor food of any kind/at all (*Heiðreksgátur* 3, Jónsson 1959)

- (12) *er eigi veit jarðar hvergi né upphimins*

5 An unexpected labial glide is found in some variant forms of *eingi*- ((i); Pfeiffer 1860:191, Cleasby and Vigfússon 1874). Another set of variants have round front vowels in the base, possibly resulting from w-umlaut (Kieckers 1928:151, *pace* Cleasby and Vigfússon 1874, Dieter 1898:642, Sturtevant 1951:69–70).

(i) *Jarl kvazt engvan þeirra spara skyldu.*

The earl said they should spare none of them. (*Grettis saga* 24, Magnússon and Thórðarson 1859:59)

what nobody on earth or in heaven knows/*doesn't know (*Lay of Thrym* 2, van Gelderen 2008:207)

(13) *þat mæli ek eigi*

I am not saying that. (*Njalssaga* 219, van Gelderen 2008:207)

2.1.2 Gothic

In Gothic, the reflex of $*\gamma^{we}$ is *-hun* (Klein 1985:285; Briceño Villalobos 2019: 146). Both the voicelessness of the initial consonant and the quality of the vowel are unexpected. Kieckers (1928:151) suggests that $*k^{we-ne}$ was remade as *-h-u-n* < $*k^{w(e)-u-ne}$ by analogy with *-u-h* < $*-u-k^{we}$. Along similar lines, we propose that speakers analyzed the $*\gamma^{we}$ in $*\gamma^{wen}$ as an allomorph of the $*x$ in $*-u-x$ < $*u-k^{we}$, and by analogy produced a form $*-x-\eta$ > *-h-un*.

Of the six attested lemmas with this morpheme, five exhibit an NPI distribution (table 2).

Table 2. Attestations of *hun* in Gothic, by lemma and contexts

Lemma	Occurrences in contexts		
	Negative	Other DE	Other
<i>ain</i> ^o + <i>hun</i> ‘one+any’ = ‘anyone’	67	2	
<i>mann</i> ^o + <i>hun</i> ‘person+any’ = ‘anyone’	10		
<i>hvan</i> + <i>hun</i> ‘when+any’ = ‘ever’	9		
<i>hvas</i> + <i>hun</i> ‘who+any’ = ‘anyone’	9		
<i>hveilo</i> + <i>hun</i> ‘while+any’ = ‘any amount of time’	1		
<i>þis</i> + <i>hun</i> ‘especially’			5

The odd item out is *þishun* ‘especially’, which Wulfila uses five times to translate Greek $\mu\acute{\alpha}\lambda\iota\sigma\tau\alpha$ ‘most’. Of the remaining 99 examples of *-hun* in the corpus, 96 occur under negation (e.g., (14)), two in (nearly identical) polar question contexts (15), and one (*Skeireins* 8:1) is too fragmentary to classify. We take *þishun* to be an idiosyncratic innovation and conclude that *-hun* formed NPIs.

(14) *ni mannanhun holop, ni mannanhun anamahjtajid jah waldaip annom izwaraim.*

Don't harass anyone, nor falsely accuse anyone, and be content with your wages. (Luke 3:14; Streitberg 1908)

(15) *sai, jau ains-hun þize reike galaubidedi imma aiþpau [þize] Fareisaie?*

Did anyone of the rulers or [of the] Pharisees believe in him? (John 7:48 \cong *Skeireins* 8:5; Streitberg 1908)

2.1.3 Old Saxon

In the OS *Heliand*, we find *wer-gin* ‘anywhere, ever, at all’ 14 times, of which 12 examples occur under negation (e.g., (16)), one in the restriction of a universal quantifier (17), and one occurs in the restriction of a superlative (18). Therefore we conclude that OS *wergin* was an NPI.

- (16) *sulic so uui her ne habdin er // undar tuisc erda endi himil / odar huerigin*, (*Hel.* 590–1; Sievers 1878:43–4)

such as never before we have had // Between earth and heaven / or anywhere else (Scott 1966:19)

- (17) *so huat so that huerigin uuas, // thia lebun under them liudeon, / endi uurdun thar giledit tuo*, (*Hel.* 2223–4; Sievers 1878:156)

whosoever was here and lived ’mid the land-folk; they were led to the place, (Scott 1966:76)

$\forall x[\text{[[was here]]}(x) \wedge \text{[[lived amid the land-folk]]}(x) \rightarrow \text{[[was led to the place]]}(x)]$

- (18) *alloro lido lofsamost / thero the ic eo an thesumu liohte gesah // huerigin hebban* (*Hel.* 2063–4; Sievers 1878:147)

The loveliest of all wines / which I ever saw lifted // Anywhere in this earth-light. (Scott 1966:70)

$\text{ix.} \forall y[\text{[[a wine which I saw lifted]]}(y) \rightarrow x >_{\text{loveliness}} y]$

2.1.4 Old High German

In the OHG *Evangelienbuch*, we count 12 occurrences of *wer-gin* ‘anywhere, ever, at all’. Ten examples occur under negation (e.g., (19)), one in the antecedent of a conditional (20), and one in what appears to be the restriction of a universal quantifier *io* ‘always’ (21). This last use was evidently not unusual, since the collocation survives in the NHG free choice item *irgend* ‘any’. We conclude that OHG *-gin* was an NPI.

- (19) *then húgu in thên githákon / ni lázet uuerigin uuánkôn* (*Ev.* 2.21.8, Piper 1878:238)

Then also make sure the spirit does not anywhere escape from you when you think. (based on Kelle 1870:153)

- (20) *Riat gót imo ofto in nótin, / in suârên árabeitin; // gigiang er in zála uuerigin thâr, / druhtin hálf imo sá* (*Ludwig* 23–4, Piper 1878:2)

Were he in dire straits, the Lord often stood by him; were he in any danger, the Lord helped him without delay. (based on Kelle 1870:487)

- (21) *Er deta íó gúat uuegin / in thórfon ioh in búrgin, // gómmane ioh uuíbe, / unz er uuas hiar in libe. // (Ev. 4.31.15–6, Piper 1878:532)*

He always did good anywhere [he went], in the villages and in the city, for the men and the women, as long as he lived. (based on Kelle 1870:363)

2.1.5 Old English

In OE, *Beowulf* attests a single example of *hwer-gen* ‘somewhere’, and it does not occur in a DE environment, but rather in the scope of a universal deontic modal (22).

- (22) *sceolde [ofer] willan / wīc eardian // elles hwergen, / swā sceal æghwylc mon (Beowulf 2589–90; Fulk, Bjork, and Niles 2008:88)*

for against his will he must win a home // elsewhere far, as must all men (Gummere 1909)

Adding to the OE evidence for **k^wené*, we have identified what we believe to be six attestations of an NPI *ænig-gen(e)* ‘anyone’ in two gospel manuscripts, one in London, British Library, Royal MS 1.A.XIV and five in Oxford, Bodleian Library, Hatton MS 38.⁶ These correspond in other OE gospels to inflected forms of *ænig* ‘any, anyone’, which occurs only in NPI contexts (table 3).

Table 3. Comparison of attestations of *ænig*, *ænig-gen* in OE gospels

Location	Context	Hatton	Royal	Corpus ^a
Mark 5:37	negation	<i>anigene</i>	<i>ænigne</i>	<i>ænigne</i>
Mark 11:25	conditional	<i>anigene</i>	<i>anigene</i>	<i>ænigne</i>
Luke 8:43	negation	<i>anygen</i>	<i>anegum</i>	<i>ænegum</i>
Luke 19:8	conditional	<i>ænigne</i>	<i>ænigne</i>	<i>ænigne</i>
John 7:51	question	<i>anigene</i>	<i>anine</i>	<i>anine</i>
John 18:31	negation	<i>anigene</i>	<i>ænigne</i>	<i>anine</i>

- a Cambridge, Parker Library, Corpus Christi College MS 140, an older West Saxon OE gospel manuscript not known to be related to the Hatton or Royal MSS (Skeat 1871–87).

6 The Hatton MS is slightly more recent and was either copied from the Royal MS or that manuscript’s source, Oxford, Bodleian Library, Bodley MS 441 (Skeat 1871, 1874; Liuzza and Doane 1995).

We posit that for at least some OE speakers, including one of the scribes in the transmission history of these manuscripts, *ænigen* was a distinct word, etymologically derived from *ænig-gen*. The addition of the NPI-forming suffix may have served to strengthen the already-existing NPI *ænig*, or it may have occurred at a stage when *ænig* was still a non-NPI indefinite. This item is attested three times in negation contexts (23), once in the restriction of a conditional (24), and once in a polar question with an implied negative bias (25). We will demonstrate after elaborating our reconstruction that the *Beowulf* example may in fact be consistent with it and conclude that OE *-gen* is in fact an NPI reflecting **k^wené*.

- (23) *Ænd he ne let hym anigene felgian. buton petrum & Iacobum & Iohannem Iacobes broðer.* (Mark 5:37, Skeat 1871:40)

And he did not let anyone follow him, but Peter, James, and James' brother John.

- (24) *for-gyfeð gyf ge hwæt agen anigene hæbbeð.* (Mark 11:25, Skeat 1871:90)

forgive, if you have something against anyone.

- (25) *Cwæst þu. demð ure éæ. anigene man bute hyne man ær hyre ; & wite hwæt he do.* (John 7:51, Skeat 1878:74)

Does our law condemn any man without first hearing him and knowing what he does?

2.2 Distribution of **k^wené* reflexes in early Indo-Aryan

Sanskrit provides ample testimony of **k^wené*, with 88 distinct tokens of *caná* 'even, any' in the *Rigveda* (Hale 2015:180).⁷ Klein (1985:285–6) divides these into four classes by context and polarity: (1) in a clause without explicit negation, interpreted as negative due to a preceding negative clause, (2) in an explicitly negated clause, (3) in a clause without explicit negation, interpreted as negative due to the presence of *caná*, and (4) in a positive clause, where *caná* does not contribute negative meaning. The majority second class (e.g., (26); Hale 2015:181 counts 52/88 distinct tokens) is trivially consistent with the hypothesis that *caná* is an NPI counterpart to *cid* 'even, any'. Hale (2015:191–3) points out that the examples of *caná* in the first and third class (28 and 6 distinct tokens, respectively) all occur in a position where the sentential negation *ná* is licensed, and that the sequence *caná ná* never occurs, though we expect it to be generable. Deviating from his conclusion,

7 I.e., counting tokens in identical passages only once.

however, we assume that in these cases *ná* has been deleted under phonological and morphological identity with the second syllable of preceding *caná*, as in (27).⁸

- (26) *índraṃ ná mahná pṛthivī caná práti* (RV 1.55.1b; Gippert 2000)

not even the earth is the counterpart to Indra in greatness. (Jamison and Brereton 2014:171)

- (27) *táva id indra ahám āśāsā / háste dátraṃ caná á dade* (RV 8.78.10ab; Gippert 2000)

With my hope on you, Indra, I don't even take scythe in hand. (based on Jamison and Brereton 2014:1177)

Klein's fourth class provides crucial evidence against a simple syntactic-agreement model of *caná*'s distribution. Klein (1985:286) and Hale (2015:197) count two examples of this type, RV 1.55.5 (28) and 6.26.7 (29). Jamison comm. (ad locc.) adds three further examples, RV 5.34.7, 10.49.5, and 10.56.4. Such a model would either fail to generate these examples (or rather, would erroneously assign them negative meanings), or it would require that non-negative items like optative verbs and the temporal adverb *ádhā* 'then' be lexically specified as *caná*-licensors.

- (28) *ádhā caná śrād dadhati tvīṣimata / indrāya vájraṃ nighánighnate vadhám* (RV 1.55.5cd; Gippert 2000)

Then indeed they place their trust in turbulent Indra, as he smashes down his mace, his deadly weapon, again and again— (Jamison and Brereton 2014:171)

- (29) *ahám caná tát sūrībhiḥ ānaśyām* (RV 6.26.7a; Gippert 2000)

Might I also, together with my patrons, attain this, (Jamison and Brereton 2014: 810)

The surface distribution of *ná* with respect to *caná* in the *Rigveda* resembles a non-strict NC system (§1.2). However, such a model would wrongly predict a negative reading in examples of the fourth class such as (28) and (29). It would also predict that negative *caná* could occur in preverbal positions that are not immediately adjacent to one of the two possible positions for sentential negation, which is not attested. The remaining Indo-Iranian evidence consists of 26 unique

8 Regardless of the actual etymology of the form, the *Sāmaveda* spells *ca ná* separately, implying that the transmitters of at least that tradition considered *caná* to be a multi-morphemic word containing the negative marker. Afrikaans exhibits a phenomenon similar to the one we propose, in which the sentence-final pleonastic negative polarity marker *nie* is deleted under (roughly) syntactic and prosodic adjacency to the homonymous negative marker (Biberauer 2007:19–21).

attestations in the *Atharvaveda*, 11 in the *Aitareya Brahmana*, 12 in the *Chandogya Upanishad*, and one in the Old Avestan *Gathas* (Hale 2015:183–4), every one of which occurs under sentential negation. The later Sanskrit examples would suggest that, despite apparent evidence for non-strict negative concord in examples like (27), speakers did not re-analyze *caná* as intrinsically negative, and instead narrowed its distribution to transparent strong negative contexts.⁹

3 Semantics of **k^wené*

3.1 The analysis

We adopt for **k^wené* and its Vedic, OE, OHG, OS and Gothic reflexes Crnič's (2011) analysis of the Slovenian concessive scalar additive particle *magari* 'even, at least'. We propose that **k^wené* spells out a pair of focus-associated operators, EVEN and AT LEAST. These take scope over a proposition containing a focused element and quantify over the Hamblin alternatives of the proposition with respect to the focused element (Rooth 1992). EVEN has the denotation given in (30).

$$(30) \quad \llbracket \text{EVEN} \rrbracket = \lambda C. \lambda p. \exists q [(q \in C) \wedge (p \triangleleft_c q)]. \lambda w. p(w)^{10} \text{ (Crnič 2011:109)}$$

That is, EVEN takes three arguments: a world *w*, a proposition *p*, and a set of alternatives *C*; it presupposes that there is some proposition *q* among the alternatives in *C* that is more likely than *p*; and it asserts that *p* is true in *w* (i.e., the assertive meaning of the host sentence is unchanged). While this denotation is too weak to capture the positive meaning of even, it suffices in the DE cases (Crnič 2011:147–52). AT LEAST is defined as in (31).

$$(31) \quad \llbracket \text{AT LEAST} \rrbracket = \lambda C. \lambda p. \forall q [(q \in C) \wedge (q \neq p) \rightarrow (q \triangleleft_c p)]. \lambda w. \exists q [(q \in C) \wedge (q \triangleleft_c p) \wedge q(w)] \text{ (Crnič 2011:109)}$$

Like EVEN, AT LEAST takes a world, a proposition, and a Hamblin set as arguments. It presupposes that *p* is more likely than any alternative *q* in *C* other than itself. It then asserts the weakened proposition that *p* or a less likely alternative *q* is true in *w*.

Crucially, operators can be interpreted with a different scope ordering than their surface syntactic ordering (May 1977; Ladusaw 1979; i.a.). We will assume

9 Crnič (2011:138–42) proposes a syntactic account of such items. On the other hand, sentential negation contexts do have a distinctive semantic property, *anti-morphicity*, so a semantic account of strong NPIs is conceivably feasible, though outside the scope of this paper.

10 $x \triangleleft_c y$ means that *x* is less likely than *y* in context *c*.

for concreteness' sake that the mechanism underlying this phenomenon is Quantifier Raising, i.e., covert but otherwise typical syntactic movement of operators (May 1985). We need such a mechanism firstly because **k^wené* is usually pronounced adjacent to its focus-associate, but EVEN and AT LEAST take propositional arguments, so they will need to move at least up to the C domain, where the denotations of spinal nodes are propositions, to get an argument of the right type. Secondly, any derivation where EVEN scopes directly over AT LEAST, or vice versa, results in semantic uninterpretability due to presupposition failure: EVEN presupposes that there is at least one q more likely than p, while AT LEAST presupposes that all q are less likely than p. Therefore, some operator that inverts or blocks scalar inferences must take scope between higher EVEN and lower AT LEAST to yield a valid interpretation. The distributional effect of this is that **k^wené* can only associate with contextually maximally-likely, i.e. *weak*, propositions, and therefore only occurs in contexts where weak propositions can be discourse-salient, as when they are denied, questioned, or indicate the minimum bound of some criterion.

In some cases, the scalar ordering that licenses **k^wené* must be inferred from context and/or world-knowledge, as in (26), where 'earth' is the weakest (most likely) alternative to attain a sufficiently high degree of 'greatness'. In other cases, the associate of **k^wené* is inherently weak. For example, in Gothic *ains-hun*, the associate *ains* 'one' is an existential quantifier, which is inherently the weakest quantifier (Lahiri 1998:87). Several forms in **k^wené*, however, are built to *wh*-words, which do not denote existential quantifiers, but rather sets of alternatives (Hamblin 1973). When these alternative sets occur in contexts where they are not quantified over, the result is a question interpretation, as opposed to an existential interpretation. Erlewine and Kotek (2016:134–8) show that in Tibetan, regular, non-NPI even (so-called *strong even*, since it can associate with strong alternatives) forms an NPI when it combines with *wh*-words, just as it does when it combines with existentials. They derive this fact from an additive operator, ADD, which obligatorily co-occurs with EVEN (their SCAL) to form strong *even*, contributing an existential presupposition (ibid. 140–50; Crnič 2011:144–52). Similarly, the AT LEAST operator which co-occurs with EVEN to form weak *even* contributes an existential assertion—namely, that some contextually-relevant alternative that is less likely than the basic assertion is true. Since the propositional content of a bare set of alternatives is vacuous, there is always a sufficiently strong alternative. Therefore, *wh*-words plus **k^wené* behave as NPI indefinites.

3.2 Deriving the distribution of **k^wené*

We will now demonstrate how the proposed account derives the attested distribution of the reflexes of **k^wené*. Negation directly inverts the entailment relationships of the proposition it scopes over (it is *anti-morphic*; van der Wouden 1997:102; see n. 9). When it scopes between EVEN and AT LEAST, their respective presuppositions are aligned rather than contradictory. Example (32) shows the derivation of (26), a case of *caná* under negation in Rigvedic. Without operators, the meaning of the sentence in (32a) is “earth is equal in greatness to Indra.” AT LEAST introduces the presupposition that all the alternatives to the earth are less likely to equal Indra in greatness, i.e., that the earth is the greatest among comparable alternatives, and weakens the assertion to “earth is at least as great as Indra” (32b). Negation then inverts this to “earth is less great than Indra” (32c). EVEN then applies, adding a presupposition that there is at least one lesser alternative to earth (trivially true given the presupposition of *at least*), and returning the assertion that earth is lesser than Indra (32d). Therefore, *caná* contributes to the base meaning an ordering by greatness over Indra, the earth, and the relevant alternatives to earth, such that the earth is greater than everything except Indra (Lahiri 1998:87–8; Crnič 2011: 113–4).

(32) *indram ná mahná prthiví caná práti* (RV 1.55.1b)

Not even the earth is the counterpart to Indra in greatness.

a. EVEN [\neg [AT LEAST [earth =_{greatness} Indra]]]

b. AT LEAST [earth =_{greatness} Indra]

Presupposition: $\forall x[x \in \{\text{man, house, village, ...}\} \rightarrow \text{earth} \geq_{\text{greatness}} x]$ ✓

Assertion: $\text{earth} \geq_{\text{greatness}} \text{Indra}$

c. \neg [earth $\geq_{\text{greatness}}$ Indra]

Assertion: $\text{earth} <_{\text{greatness}} \text{Indra}$

d. EVEN [earth $<_{\text{greatness}}$ Indra]

Presupposition: $\exists x[x \in \{\text{man, house, village, ...}\} \wedge \text{earth} >_{\text{greatness}} x]$ ✓

Assertion: $\text{earth} <_{\text{greatness}} \text{Indra}$ ✓

In positive contexts, EVEN and AT LEAST derive contradictory implicatures, so **k^wené* is not licensed (Crnič 2011:110–2). For example, the polar question in (25), repeated in (33), yields a positive and a negative alternative. But the positive

alternative is semantically ill-formed, since it presupposes that the basic meaning is simultaneously more likely and not more likely than any alternative (33b). The negative alternative, on the other hand, is well-formed since EVEN can scope over negation as in (32). The question in (33) therefore communicates the speaker’s assumption that the answer is negative (Guerzoni 2003, 2004; Crnič 2011:114–6).

- (33) *Cwæst þu. demð ure éa. anigene man bute hyne man ær hyre ; & wite hwæt he do.* (John 7:51, Skeat 1878:74)

Does our law condemn any man without first hearing him and knowing what he does?

- a. { [[our law condemns any man without due process]], ¬[[our law condemns any man without due process]] }

- b. EVEN [AT LEAST [our law condemns one man ...]]

Presupposition (AT LEAST): $\forall x[x \in \{1, 2, 3, \dots\} \rightarrow \llbracket \text{our law condemns 1 man ...} \rrbracket \geq_{\text{likelihood}} \llbracket \text{our law condemns } x \text{ men ...} \rrbracket]$

= $\forall x[x \in \{1, 2, 3, \dots\} \rightarrow 1 \geq x]$ ¹¹ ✓

Presupposition (EVEN): $\exists x[x \in \{1, 2, 3, \dots\} \wedge \llbracket \text{our law condemns 1 man ...} \rrbracket <_{\text{likelihood}} \llbracket \text{our law condemns } x \text{ men...} \rrbracket]$

= $\exists x[x \in \{1, 2, 3, \dots\} \rightarrow x > 1]$ #

The universal quantification examples (including conditionals and superlatives) are derived in largely the same way as the negation examples. In (34a) (= (24)), AT LEAST scopes inside the restriction of the conditional, while EVEN scopes out over the entire conditional. Combined with its complement, AT LEAST presupposes that having something against one person is at least as likely as having something against any non-zero number of people (since the former entails the latter), and asserts that you have something against a non-zero number of people (34b). This assertion then becomes the restriction of the conditional operator (34c). Finally, EVEN presupposes that being required to forgive if one has something against one person is no more likely than being required to forgive if one has something against any non-zero number of people (since the latter entails the former), and outputs the expected assertion (34d).

11 This follows from the fact that condemning $x > 1$ men entails condemning 1 man. “If a proposition p entails a proposition q , q cannot be less likely than p ” (Crnič 2011:112).

(34) *for-gyfeð gyf ge hwæt agen anigene hæbbeð.* (Mark 11:25; Skeat 1871:90)

forgive, if you have something against anyone.

a. EVEN [IF [AT LEAST [you have something against one person][□[you forgive]]]

b. AT LEAST[you have something against one person]

Presupposition: $\forall x[x \geq 1 \rightarrow \llbracket \text{you have something against 1 person} \rrbracket$
 $\geq_{\text{likelihood}} \llbracket \text{you have something against } x \text{ people} \rrbracket$

= $\forall x[x \in \{1, 2, 3, \dots\} \rightarrow 1 \leq x]$ ✓

Assertion: $\exists x[x \geq 1 \wedge \llbracket \text{you have something against } x \text{ people} \rrbracket]$

c. if [$\exists x[x \geq 1 \wedge \llbracket \text{you have something against } x \text{ people} \rrbracket$][□[you forgive]]]

= $\forall w[(\exists x[x \geq 1 \wedge \llbracket \text{you have st. against } x \text{ people} \rrbracket]) \rightarrow \square \llbracket \text{you forgive} \rrbracket](w)$

d. EVEN[$\forall w[(\exists x[x \geq 1 \wedge \llbracket \text{you have something against } x \text{ people} \rrbracket]) \rightarrow \square \llbracket \text{you forgive} \rrbracket](w)$]

Presupposition: $\exists y[\forall w[(\exists x[x \geq 1 \wedge \llbracket \text{you have something against } x \text{ people} \rrbracket]) \rightarrow \square \llbracket \text{you forgive} \rrbracket](w) <_{\text{likelihood}} \forall w[(\exists x[x \geq y \wedge \llbracket \text{you have something against } x \text{ people} \rrbracket]) \rightarrow \square \llbracket \text{you forgive} \rrbracket](w)]$

= $\exists y[y > 1]$ ✓

Assertion: $\forall w[(\exists x[x \geq 1 \wedge \llbracket \text{you have something against } x \text{ people} \rrbracket]) \rightarrow \square \llbracket \text{you forgive} \rrbracket](w)$ ✓

3.3 Interpreting **k^wené* in non-downward-entailing contexts

We are now in a position to address the OE and *Rigvedic* examples of **k^wené* in non-DE contexts.¹² Two of these occur in the scope of a universal modal. Crnič (2011:56–62,145,157) observes that concessive scalar additive particles are licit in some such contexts. He proposes that AT LEAST takes scope below the modal, while EVEN takes scope over it. AT LEAST triggers the presupposition that the proposition below the modal is the weakest among its alternatives, while EVEN presupposes that the entire proposition is stronger than at least one alternative. In (29), repeated

12 A. Yates (p.c.) brought to our attention further examples of this type proposed by Jamison, *RV Comm.* ad 5.34.7, 10.49.5, 10.56.4. These seem to us to support our argument, but we will defer analyzing them to later work.

as (35), *caná* is associated with ‘I’. The basic proposition is that Indra bestows his favor on the speaker and his patrons. The presupposition of AT LEAST is either that the speaker is the most deserving of all relevant possible beneficiaries, or that the speaker getting what he asks is more likely than the inverse; either seems plausible to us. The presupposition of EVEN is that there is some alternative set of people that the speaker would prefer to be blessed by Indra. Assuming that the speaker has any human attachments aside from his patrons whom he would also be pleased to see blessed, this too seems reasonable.

(35) *ahám caná tát sūrībhiḥ ānaśyām* (RV 6.26.7a; Gippert 2000)

Might I also, together with my patrons, attain this, (Jamison and Brereton 2014: 810)

i.e. “Might at least I ...”

The other case of **k^wené* under a universal modal is (22), repeated here as (36). The suffix *-gen* would seem to be associated with (*elles*) *hwer-* ‘(else) where’. In this case, we should expect a free choice reading, along the lines of “he must win a home anywhere he pleases, other than here.” But this seems improbable, since the context is that Beowulf is dying; “elsewhere” would seem to refer to the after-life. A more promising interpretation is that *elles* modifies *wīc* “home,” not *hwer-*, and that *hwergen* has here the figurative, temporal/circumstantial meaning ‘ever, eventually, at some point’ already attested for its OS and OHG cognates. In this case, the presupposition of AT LEAST is that ‘at any time’ is the least restrictive possible schedule; and the presupposition of EVEN is that there are more likely possible requirements with respect to time of death. Conceivably the latter could refer either to a more restrictive schedule imposed by external forces (in that most of the time, including in Beowulf’s case, one doesn’t choose the circumstances of one’s death) or it could refer to the preference of the one concerned that he not have to die. Finally, it’s possible that the focused element is the entire predicate ‘to die’. In this case, the AT LEAST presupposition is that dying is the most likely predicate of an individual, and the EVEN presupposition is that some alternative to dying would be preferable. These presuppositions also seem plausible.

(36) *sceolde [ofer] willan / wīc eardian // elles hwergen, / swā sceal æghwylc mon* (Beowulf 2589–90; Fulk, Bjork, and Niles 2008:88)

for against his will he must win a home // elsewhere far, as must all men (Gummere 1909)

i.e., “he must die, eventually at least, like all men” or “he must, at least, die, like all men”

Finally, in (28), repeated as (37), *caná* associates with *ádhā* ‘then’. If we read the sentence with silent exhaustification, that is, with a silent ‘only’ associated with the focused element, as Geldner (1951) does, then the overall sentence becomes non-monotonic, i.e., neither upward- nor downward-entailing (Crnič 2011:117–8). AT LEAST introduces the presupposition that “as [Indra] smashes down his mace ...” is the most likely time for “the peoples” to place their trust in him; EVEN adds the presupposition that there is at least one more likely set of circumstances than “(only) as he smashes down his mace ...,” under which the peoples might trust Indra. The first presupposition is reasonable in case Indra’s violent intervention makes it more desirable to trust him, which would seem to be consistent with the context. The second presupposition goes through as long as there are any other circumstances in which the peoples might be expected to trust Indra, which we also find plausible.

(37) *ádhā caná śrād dadhati tvīṣmata / indrāya vājraṃ nighānighnate vadhām* (RV 1.55.5cd; Gippert 2000)

Then indeed they place their trust in turbulent Indra, as he smashes down his mace, his deadly weapon, again and again— (Jamison and Brereton 2014:171)

i.e., “Then, at least, they place their trust in turbulent Indra, just/precisely as he smashes down his mace ...”

4 Conclusion

We have proposed a semantic account of the Proto-Indo-European word **k^wené* and its reflexes in several early Indo-European languages, which predicts not only the item’s meaning but also its characteristic distribution. The decomposition of the word into two co-associated focus-sensitive operators with contradictory presuppositions ensures that it can occur only in contexts where one of these operators can take high scope over another, intervening operator which alters the entailment patterns of the underlying proposition. We have not only derived the most prevalent types of contexts in which this item occurs, but also shown that many of what were taken to be exceptional uses are in fact consistent.

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