

# The meaning and distribution of the discourse particle, *kwa* in Igbo

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## TripleA

### 1 Introduction

- Igbo has a particle, *kwa*, that is similar to *even* in some of its uses:

(1) Ø    nà-àkpú    isí,    ọ    nà-àsá    à-sá,    ná-ésē-kwá    tatuu    ísí.  
3sg    HAB-cut    hair    3SG    HAB-wash    NOM-wash    HAB-draw-KWA    tattoo    head  
'He cuts hair; he washes and even draws head tattoos.'

- According to classical analyses, *even* presupposes that its prejacent is less likely than its alternatives (Karttunen & Peters 1979).
- (2) Jane even invited Lucy to the party.
- *Kwa* has a number of additional functions and differs from *even* in a number of respect, but we argue for a scalar analysis that unifies additive and non-additive uses:
  - We show that *kwa* has a wide range of uses (mirative, incredulity, objection, disapproval or warning, scalar additive).
  - We show that *kwa* can target different levels of meaning including at-issue and non-at-issue content.
  - We argue that all its uses can be reduced to a single semantic core that manipulates the expected value of a proposition (its target) and of its alternatives, following Chung & Mascarenhas' (2023) analysis of modality.

#### Roadmap

1. Brief background on Igbo
2. Properties of *kwa*
3. A semantics for *kwa*
4. Comparison with Chung & Mascarenhas (2023)
5. Conclusion

### 1.2 Background on Igbo

- Igbo: Kwa group, Benue-Congo, spoken in eastern part of Nigeria by est. 30 million people; tone language — two basic tones high (é) and low (è), and a down-step (ē); SVO order, rich verbal morphology.

- Main sentence types:

- (3) *Wh-Question*  
 Ọnyé kà Adá mákù-rù?  
 who C Ada hug-SFX  
 ‘Who did Ada hug?’
- (4) *Yes/No question*  
 Ò sì-rì jí?  
 3sg cook-SFX yam  
 ‘Did he cook yam?’
- (5) *Declarative*  
 Ó sì-rì jí.  
 3SG cook-SFX yam  
 ‘He cooked yam.’
- (6) *Imperative*  
 Rì-é nri!  
 eat-ovs food  
 ‘Eat!’
- (7) *Prohibitive*  
 É-rì-lā ñrī!  
 PR-eat-NEG.IMP food  
 ‘Don’t eat!’

## 2 Properties of *kwa*

### 2.1 Discourse uses

#### 2.1.1 Mirativity

- Mirativity: grammatical encoding of unexpectedness or surprise in the discourse, either on the part of the speaker or other discourse participants (Delancy 1997; Aikhenvald 2012).
- (8) *Nkem and her sister are at home when suddenly, they see their stingy older cousin who has had an old rickety car for a very long time, driving into their driveway in a new car. Nkem says:*
- Obi gò-kwà-rá úgbọ̀là ọ́húrū!  
 Obi buy-KWA-SFX vehicle new  
 ‘Obi bought a new car!’
- Counterexpectational flavour that is connected to Obi’s spending habits.

### 2.1.2 Incredulity

- *Kwa* may be used to signal disbelief or skepticism towards a proposition:

(9) A: Kèdú ògbè Ada kwùsì-rĩ í-sè sǐgá?  
which time Ada stop-SFX INF-smoke cigarette  
'When did Ada stop smoking?'

B: Kwùsì-kwà-rà í-sè sǐgá↑  
stop-kwa-PST INF-smoke cigarette  
'Stopped smoking?!'

- The speaker calls into question the addressee's presupposition that Ada used to smoke.
- Ambiguous: they may also call into question the assertion that Ada no longer smokes.

### 2.1.3 Objection

- *Kwa* may be used to challenge or object to a proposition.

(10) *Uche and Obi are friends who work at the same company and live on the same street. Last night, they visited a pub together, but Uche left before Obi to go home. Obi knows that Uche is married. The next morning, he sees Uche at the office.*

A: M fú-rú kà Ǫ nà-èsúsù nwányì ọnú n'ábàlì únyàá.  
1SG see-SFX C 2SG PROG-kiss woman mouth at night yesterday  
'I saw you kissing a woman last night.'

~ The woman that the addressee kissed was not his wife.

B: Ọ bù-kwà nwúnyè mí.  
It be-KWA wife 1SG  
'That was my wife!'

- The speaker rejects A's conversational implicature.

### 2.1.4 Disapproval or Warning

- *Kwa* may be used to express disapproval or warning:

(11) *Some people came to see my boss and I ask them to wait by the corner of the building while I call him. Just before I leave to call my boss, I say to them:*

À dì-ghì ésè-#(kwá) sǐgá ébé à.  
INDEF PROG-NEG smoke-KWA cigarette place DEM  
'Smoking is not allowed here.'

- In this example, the speaker conveys disapproval of smoking; without *kwa*:
  - the sentence would be interpreted as a non-modal statement of facts.
  - the sentence would be odd in this context (cf. 'People aren't smoking here.').

(12) *Someone asking for directions at a bus terminal in Lagos:*

A: Kèdú ètù mí gà-èsí rú Lekki?  
 What manner 1SG FUT-take get Lekki  
 ‘How do I get to Lekki?’

B: Bà-á bọ̀sù ùkẹ̀ àḅọ́.  
 enter-OVS.IMP bus LINK two  
 ‘Take bus 2’ (*directive*)

B: Bà-kwá-á bọ̀sù ùkẹ̀ àḅọ́.  
 enter-KWA-OVS.IMP bus LINK two  
 ‘You’d better take bus 2!’ (*warning*)

- In this example, *kwa* optionally combines with an imperative:
  - without *kwa*, the imperative is interpreted as a piece of advice, compatible with alternative choices.
  - with *kwa*, the speaker is warning the addressee against taking an alternative route.

### 2.1.5 Scalar additivity uses

- As already mentioned, *kwa* also has scalar additive uses:

(13) Ọ̀ nà-àkpú isí, ọ̀ nà-àsá à-sá, ná-ésē-kwá tatuú isí.  
 3sg HAB-cut hair 3SG HAB-wash NOM-wash HAB-draw-KWA tattoo head  
 ‘He cuts hair; he washes and even draws head tattoos.’

## 2.2 Levels of meaning targeted by *kwa*

- Uses of *kwa* vary in the levels of meaning they target.
- ‘Target’ is used here to refer to the proposition to which the aforementioned functions apply (mirativity, objection, ...).

### 2.2.1 At-issue literal meaning

- In the simplest cases, *kwa* targets the literal at-issue content of an utterance:

(14) *Ada is married to Uche, and they are part of a large extended family. A family meeting was fixed on Friday night at Ada’s parents-in-law’s house but Ada was absent. On Saturday morning, Ada’s sisters-in-law (A) call her husband (B) to discuss Ada’s absence:*

A: Ada gà-rà pátì n’ábàlì ùnyáá.  
 Ada go-SFX party at night yesterday  
 ‘Ada went to the party last night.’

B: Ó sò-kwá mí nọ-rọ́ n’úìlọ́.  
 3SG follow-KWA 1SG stay-SFX at home  
 ‘No, she was at home with me.’

- Here, the speaker objects to the literal content of A’s utterance.

### 2.2.2 At-issue non-literal meaning — conversational implicatures

- *Kwa* can also target non-literal at-issue content:

(15) A: ‘I saw you kissing a woman last night.’

B: Ọ̀ bù-kwà nwúnyè mí!  
It be-KWA wife 1SG  
‘That was my wife.’

- In this case, the speaker is objecting to a conversational implicature of A’s utterance.

### 2.2.3 Non-at-issue content

- *Kwa* can also target non-at issue content, in the form of presupposed or conventionally implicated propositions:

- *kwa* targets a presupposition of A’s utterance:

(16) A: ‘When did Ada stop smoking?’

B: Kwùsì-kwà-rà í-sè sǐgá↑  
stop-kwa-PST INF-smoke cigarette  
‘Stopped smoking?!’

*Objection to the claim that she used to smoke.*

- *kwa* targets a conventional implicature of A’s utterance:

(17) A: Jọ̀nù̀ bù ónyé Fúràǹsì mànà ọ̀ bù ézígbò m̀m̀ādù̀.  
John be person France but 3SG be good person  
‘John is French, but he is a nice person.’

B: Ńdì Fúràǹsì bù-kwà èzígbò m̀m̀ādù̀!  
people France be-KWA good person  
‘French people are nice!’

*Objection to the claim that they are not nice.*

### 2.3 Sources of *kwa*’s target

*Relation to prejacent:*

- In some examples, *kwa* appears to target the proposition denoted by the prejacent:

(18) Obi gò-kwà-rá úgbòl̀à ọ̀húrū̀!  
Obi buy-KWA-SFX vehicle new  
‘Obi bought a new car!’

*The speaker is surprised that O. bought a new car.*

- In others, *kwa* appears to target the negation of the prejacent:

(19) A: ‘I saw you kissing a woman last night.’

B: Ọ̀ bù-kwà nwúnyè mí.  
It be-KWA wife 1SG  
‘That was my wife!’

*The speaker objects to the claim that the woman they kissed wasn’t their wife.*

- In yet other examples, the proposition being targeted is merely entailed by the prejacent:

(20) A: ‘When did Ada stop smoking?’

B: Kwùsì-kwà-rà ì-sè sǐgá↑  
 stop-kwa-PST INF-smoke cigarette  
 ‘Stopped smoking?!’

*The speaker objects to the claim that Ada used to smoke.*

*The target is presupposed and entailed by the proposition that Ada stopped smoking.*

*Relation to previous context:*

- In many cases, the proposition being targeted was made salient prior to the speaker’s utterance, either in prior discourse or through extra-linguistic context.
- However, this is not always the case:

(21) *Some people came to see my boss and I ask them to wait by the corner of the building while I call him. Just before I leave to call my boss, I say to them:*

À dī-ghì é-sè-#(kwá) sǐgá ébé à.  
 INDEF PROG-NEG smoke-KWA cigarette place DEM  
 ‘Smoking is not allowed here.’ (*lit.*, ‘People aren’t smoking here *kwa*’)

*The speaker informs the addressee that smoking is not allowed.*

*Proposal:*

- We propose that *kwa* targets a proposition that is entailed by an answer to the Question Under Discussion (QUD):
  - In assertions, the QUD is retrieved by answer/question congruence.
  - In questions, the relevant QUD is the question raised by the utterance itself.

### 3 Towards a semantic analysis of *kwa*

- We propose that *kwa* compares the expected value of a proposition to that of its alternatives.
- Our definition of expected value is taken from Chung & Mascarenhas’ (2023) analysis of modal auxiliaries:

$$(22) \mathbb{E}_w[\mu_{\text{EVAL}} \mid \varphi] = \sum_{w_j \in \varphi} \mu_{\text{EVAL}(w_j)} \times \text{Pr}_w(\{w_j\} \mid \varphi)$$

*The expected value of  $\mu_{\text{EVAL}}$  conditioned on  $\varphi$*

- $\mu_{\text{EVAL}}$  is a measure function that maps a world  $w$  to the number of propositions from a set  $R$  that are true in  $w$ :

$$(23) \mu_{\text{EVAL}} = \lambda w. |\{r \in R \mid r \text{ is true at } w\}|,$$

*Where  $R$  is a set of relevant propositions.*

- The interpretation of  $\mathbb{E}_w[\mu_{\text{EVAL}} \mid \varphi]$  is relative to  $R$ :
  - If  $R$  is a set of facts to be explained:  $\mathbb{E}_w[\mu_{\text{EVAL}} \mid \varphi]$  is the **explanatory value** of  $\varphi$ , a sum over likelihoods of  $\varphi$  with respect to each fact to be explained.
  - If  $R$  is a set of ideals/rules:  $\mathbb{E}_w[\mu_{\text{EVAL}} \mid \varphi]$  is the **utility value** of  $\varphi$ .
- We may then compare  $\mathbb{E}_w[\mu_{\text{EVAL}} \mid \varphi]$  to a threshold  $\theta$ :
  - $\mathbb{E}_w[\mu_{\text{EVAL}} \mid \varphi] < \theta$ : the explanatory/utility value of  $\varphi$  fails to meet  $\theta$ .

### 3.1 The meaning of *kwa*

- We propose that *kwa* conventionally implicates that the explanatory/utility value of its target fails to meet a contextual threshold  $\theta$ , unlike that of its alternatives:

$$(24) \quad \llbracket [\text{Kwa } \varepsilon_{st}] S \rrbracket^{g,w} = \llbracket S \rrbracket^{g,w}$$

Conv. Implicature:  $\mathbb{E}_w[\mu_{\text{EVAL}} | \llbracket \varepsilon_{st} \rrbracket^{g,w}] < \theta \wedge \forall \psi \in \text{Alt}(\llbracket \varepsilon_{st} \rrbracket^{g,w}) : \mathbb{E}_w[\mu_{\text{EVAL}} | \psi] \geq \theta$

Presupposition:  $\exists \varphi \in \text{QUD}$  s.t.  $\varphi \models \llbracket \varepsilon_{st} \rrbracket^{g,w}$

- $\llbracket \varepsilon_{st} \rrbracket^{g,w}$  is a contextual variable of type  $\langle s, t \rangle$ .
- The discourse effect of *kwa* (mirativity, incredulity, objection, disapproval or warning, scalar additivity) is due to the combined effect of:
  - the choice of *R* (facts vs. rules);
  - the contextual resolution of the target  $\llbracket \varepsilon_{st} \rrbracket^{g,w}$ ;
  - the illocutionary force of the speaker's utterance.

### 3.2 Discourse effects of *kwa*

#### 3.2.1 Objection

- In (25), *kwa* conveys that the speaker objects to the conversational implicature that the woman he kissed was not his wife:

(25) A: 'I saw you kissing a woman last night.'

B: Ø bù-kwà nwúnyè mí!  
It be-KWA wife 1SG  
'That was my wife.'

- The discourse effect is derived by setting parameters as follows:
  - QUD: *Was the woman the speaker kissed his wife?*
  - $\llbracket \varepsilon_{st} \rrbracket^{g,w}$ : *The woman the speaker kissed was not his wife.*
  - $\text{Alt}(\llbracket \varepsilon_{st} \rrbracket^{g,w})$ : *The woman the speaker kissed was his wife.*
  - *R*: a set of facts to be explained in light of A's utterance:
    - *that the speaker is married,*
    - *that the speaker kissed a woman last night,*
    - ...
- The speaker asserts that the woman he kissed was his wife and conventionally implicates that this proposition provides a good enough explanation of the facts, unlike the proposition that the woman wasn't his wife.
- The specific effect of objection is tied to the fact that the speaker asserts that the woman he kissed was his wife, which is inconsistent with the target.

#### 3.2.2 Incredulity

- In (26), *kwa* conveys doubt towards the presupposition that Ada used to smoke; this is not a blanket rejection:

(26) A: 'When did Ada stop smoking?'

B: Kwùsì-kwà-rà í-sè sìgá↑  
stop-kwa-PST INF-smoke cigarette  
'Stopped smoking?!'

- Incredulity is derived by setting parameters as follows:
  - QUD: *Did Ada stop smoking?*
  - $[[\varepsilon_{st}]]^{g,w}$ : *Ada used to smoke.*
  - $\text{Alt}([\varepsilon_{st}]]^{g,w}$ : *Ada did not use to smoke.*
  - *R*: a set of facts to be explained in light of A's utterance:
    - *that the speaker never saw Ada smoking,*
    - *that Ada runs marathons,*
    - ...
- The conventional implicature is calculated as in (25), but in that case, the fact that the speaker's utterance is consistent with  $[[\varepsilon_{st}]]^{g,w}$  makes it possible to interpret the CI as an expression of incredulity rather than objection.

### 3.2.3 Disapproval or warning

- In (27), *kwa* is used to disallow a course of action:
 

(27) *Some people came to see my boss and I ask them to wait by the corner of the building while I call him. Just before I leave to call my boss, I say to them:*

À      di-ghī      èsè-kwá      sǐgá      ébé      à.  
 INDEF   PROG-NEG   SMOKE-KWA   cigarette   place   DEM  
 'Smoking is not allowed here.'
- We derive the deontic interpretation as follows:
  - QUD: *Do people smoke here?*
  - $[[\varepsilon_{st}]]^{g,w}$ : *People smoke here.*
  - $\text{Alt}([\varepsilon_{st}]]^{g,w}$ : *People don't smoke here.*
  - *R*: a set of rules to be followed:
    - *Smoking is not allowed inside the building,*
    - *Smoking is not allowed outside next to air intake vents,*
    - ...
- The speaker conventionally implicates that smoking here is not a good enough course of action, unlike its alternative, namely, not smoking here.

### 3.2.4 Deriving mirativity

- Consider next the expression of surprise:
 

(28) *Nkem and her sister are at home when suddenly, they see their stingy older cousin who has driven his old rickety car for a very long time, driving into their driveway in a new car.*

Obi   gò-kwà-rá      úgbọ̀là      ọ́húrū!  
 Obi   buy-KWA-SFX   vehicle   new  
 'Obi bought a new car!'

- The parameters are set as follows:
  - ▶ QUD: *How did Obi get that new car?*
  - ▶  $\llbracket \varepsilon_{st} \rrbracket^{g,w}$ : *Obi bought it.*
  - ▶  $\text{Alt}(\llbracket \varepsilon_{st} \rrbracket^{g,w})$ : *Obi rented it, Obi borrowed it from a friend, ...*
  - ▶  $R$ : a set of facts to be explained in light of the extra-linguistic context:
    - ▶ *Obi is a cheapskate,*
    - ▶ *Obi was happy with his old car,*
    - ▶ ...
- The CI is that the proposition that Obi bought the car does not provide a satisfactory explanation of the facts, contrary to its alternatives.
- Yet, the speaker asserted that Obi bought a new car. This might seem to contradict the CI, but:
  - ▶ The explanatory value of  $\mu_{\text{EVAL}}$  conditioned on  $\varphi$  (i.e.,  $\mathbb{E}_w[\mu_{\text{EVAL}} \mid \varphi]$  in the epistemic case) is not the same as the probability that  $\varphi$  is true.<sup>1</sup>
  - ▶ A proposition might have a high probability of being true and a low explanatory value in the sense that it does not explain some observed data very well.
  - ▶ We propose that the mirativity of (28) arises as a consequence of this tension:
    - By asserting that Obi bought a new car, the speaker conveys high credence toward this proposition.
    - Through his CI, the speaker conveys that the proposition is nevertheless a poor explanation of a salient set of facts.
    - This comes out as an expression of surprise.

### 3.2.5 Deriving scalar additivity

- According to classical analyses (Karttunen & Peters 1979, Rooth 1985), *even* triggers a scalar presupposition that assigns lower probability to a proposition than to its alternative, and an additive presupposition that entails the truth of some alternative:<sup>2</sup>

$$(29) \quad \llbracket \text{even } \varphi \rrbracket_o^{g,w} = \llbracket \varphi \rrbracket_o^{g,w}$$

Scalar presupposition:  $\forall q \in \llbracket \varphi \rrbracket_f^{g,w} : (q \neq \llbracket \varphi \rrbracket_o^{g,w}) \rightarrow (\llbracket \varphi \rrbracket_o^{g,w} <_{\mu} q)$

Additive presupposition:  $\exists q \in \llbracket \varphi \rrbracket_f^{g,w} : (q \neq \llbracket \varphi \rrbracket_o^{g,w}) \wedge q(w) = 1)$

- The conventional implicature of *kwa* is similar to a scalar presupposition insofar as it epistemic interpretation ranks alternatives by explanatory values:

(30) *Someone talking about his brother's barber shop business to his colleagues:*

Ø    nà-àkpú    isí,    ọ    nà-àsá    à-sá,    ná-ésē-kwá    tatuu    isí.  
3sg   HAB-cut   hair   3SG   HAB-wash   NOM-wash   HAB-draw-KWA   tattoo   head  
‘He cuts hair; he washes and even draws head tattoos.’

- ▶ QUD: *What kind of service does he offer?*
- ▶  $\llbracket \varepsilon_{st} \rrbracket^{g,w}$ : *He draws head tattoos.*
- ▶  $\text{Alt}(\llbracket \varepsilon_{st} \rrbracket^{g,w})$ : *He cuts hair, he washes hair, ...*
- ▶  $R$ : a set of facts to be explained about his brother's business.

<sup>1</sup>Technically, it is the sum over the likelihoods of  $\varphi$  with respect to the facts in  $R$ , where the likelihood of  $\varphi$  with respect to some fact  $e$  is the probability of  $e$  given the hypothesis  $\varphi$ , see Chung & Mascarenhas (2013), pp. 10–11. Likelihoods in that sense are not probabilities. Notably, they are not guaranteed to add up to 1.

<sup>2</sup>Karttunen & Peters (1979) use the concept of *likelihood* rather than *probability*. We eschew the use of *likelihood* to avoid confusion with the technical sense of *likelihood* that we use in the handout, i.e., the likelihood of a hypothesis  $\varphi$  relative to observed evidence  $e$  is the probability of  $e$  given  $\varphi$ .

- The CI is that there is a threshold  $\theta$  that  $\llbracket \varepsilon_{st} \rrbracket^{g,w}$  does not meet but that all its alternatives meet:
  - In other words, the proposition that he draws hair tattoo is the least satisfying explanation of the facts among all alternatives.
  - This does not entail that the probability that this proposition is true is less than that of its alternatives.
  - However, it captures the intuition that the target is more surprising than its alternatives: *e.g.*, the probability of owning a barber shop given that one draws head tattoos for a living is less than the probability of owning a barber shop given that one cuts hair (or washes hair) for a living, and this makes drawing head tattoos a surprising explanation of that fact.
- Note that additivity is not part of the CI triggered by *kwa*:
  - In (30), it is a contextual entailment: the speaker asserts alternatives prior to using *kwa*.
  - This predicts that, without this contextual support, the scalar additive interpretation of *kwa* will be unavailable unless another strategy is used to express additivity.
  - This prediction is borne out: in contexts where additivity is not entailed by the preceding discourse moves, the additive particle *mà* ('also') must co-occur with *kwa* to express scalar additivity:

- (31) a. Úchè m̀è-kwà-rà mà àchìchà.  
Uche do-KWA-SFX also bread  
'Uche even baked bread.'
- b. Úchè m̀è-rè mà àchìchà.  
Uche do-SFX also bread  
'Uche also baked bread.'

- In sum, we propose that scalar additive uses arise as a combination of:
  - a CI that assigns lowest explanatory value to the prejacent
  - an utterance that nonetheless asserts the prejacent, conveying surprise
  - additivity coming either from previous discourse or from a separate particle

#### 4 Comparison to Chung & Mascarenhas (2023)

- Chung & Mascarenhas (2003) develop an expected value theory of modality that assigns the following denotations to universal and existential modals, preserving their duality:
- (32) a.  $\llbracket \text{must } \varphi \rrbracket^w = \mathbb{E}_w[\mu_{\text{EVAL}}|\varphi] > \theta \wedge \forall \psi \in \text{Alt}(\varphi) : \mathbb{E}_w[\mu_{\text{EVAL}}|\psi] \leq \theta$   
b.  $\llbracket \text{might } \varphi \rrbracket^w = \mathbb{E}_w[\mu_{\text{EVAL}}|\neg\varphi] \leq \theta \vee \exists \psi \in \text{Alt}(\neg\varphi) : \mathbb{E}_w[\mu_{\text{EVAL}}|\psi] > \theta$
- Chung & Mascarenhas's analysis is motivated by the desire to account for modal versions of reasoning fallacies and cross-linguistic support from the study of Korean modal expressions.
  - *kwa*'s CI is similar to a universal modal statement scoping over negation, but is not equivalent to it. Compare:

- (33) a.  $\llbracket [\text{Kwa } \varepsilon_{st}]S \rrbracket^w = \llbracket S \rrbracket^w$   
Conv. Implicature:  $\mathbb{E}_w[\mu_{\text{EVAL}}|\llbracket \varepsilon_{st} \rrbracket^w] < \theta \wedge \forall \psi \in \text{Alt}(\llbracket \varepsilon_{st} \rrbracket^w) : \mathbb{E}_w[\mu_{\text{EVAL}}|\psi] \geq \theta$   
Presupposition:  $\exists \varphi \in \text{QUD}$  s.t.  $\varphi \vDash \llbracket \varepsilon_{st} \rrbracket^w$
- b.  $\llbracket \text{must } \neg\varphi \rrbracket^w = \mathbb{E}_w[\mu_{\text{EVAL}}|\neg\varphi] > \theta \wedge \forall \psi \in \text{Alt}(\neg\varphi) : \mathbb{E}_w[\mu_{\text{EVAL}}|\psi] \leq \theta$

- In simple terms:
  - $\llbracket \text{must } \neg\varphi \rrbracket^w$  states that  $\neg\varphi$  is good enough and is the best of all alternatives.
  - $\llbracket [\text{Kwa } \varphi]S \rrbracket^w$  implicates that  $\varphi$  is not good enough and is the worst of all alternatives.
- What breaks the equivalence between  $\text{kwa}_\varphi$ 's CI and  $\llbracket \text{must } \neg\varphi \rrbracket^w$  is the non-equivalence of  $\mathbb{E}_w[\mu_{\text{EVAL}} | \varphi] < \theta$  and  $\mathbb{E}_w[\mu_{\text{EVAL}} | \neg\varphi] > \theta$  in the general case.
- However, given the quantification over alternatives built in the semantics of *kwa* and *must*, the equivalence holds<sup>3</sup> under the following assumptions/postulates:
  - Postulate 1: the set of alternatives is closed under negation  $\varphi$
  - Postulate 2:  $\neg\varphi$  and  $\varphi$  cannot have the same expected/utility value.<sup>4</sup>
- This suggests that some uses of *kwa* might be paraphrasable with *must not*, or equivalently with a negated existential modal statement. The prediction seems to be borne out. Consider for instance the quasi-mirative use of epistemic *can't* in the following example:
 

(34) *Nkem and her sister are at home when suddenly, they see their stingy older cousin who has driven his old rickety car for a very long time, driving into their driveway in a new car.*

  - Obi gò-kwà-rá      ùgbọ̀là    ọ́húrū!  
Obi buy-KWA-SFX vehicle new  
'Obi bought a new car!'
  - Obi can't have bought a new car!

## 5 Conclusion

- We argue that the multiple uses of *kwa* can be reduced to a simple semantic core interacting with contextual features.
- The proposed analysis builds on an expected-value theory of modality (Chung & Mascarenhas 2003) initially motivated by modal reasoning fallacies and the composition of Korean modals.
- The framework allows us to highlight the similarities between *kwa* and modal necessity or possibility without strictly reducing the former to the latter.

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<sup>3</sup>Up to the difference between  $<$  and  $\leq$ .

<sup>4</sup>*I.e.*, if we assume that  $\mathbb{E}_w[\mu_{\text{EVAL}} | \varphi] \neq \mathbb{E}_w[\mu_{\text{EVAL}} | \neg\varphi]$  for all  $\varphi$  and  $w$ .

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