Focus interpretation and covert movement: the *dake* blocking effect[1]

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Goals of this talk

In this talk we consider the effect of the Japanese 'only' word *dake* on quantifier scope. In particular, I am to:

- present **the *dake* blocking effect**;
- explain this effect by proposing **a general condition on the scope of quantifiers which are focus-marked** and examining the scope of the *dake*; and
- accurately model the interpretation of **stacked *dake* + *shika*** and its grammaticality conditions.

1 The *dake* blocking effect

Consider the effect of the Japanese constituent-'only' word *dake* below:

(1) **Possessors can regularly take wide scope:**

太郎 と 花子 の 犬
tarō to hanako no inu
Taro and Hanako GEN dog

✓'Taro and Hanako's dog(s)' dog > T+H
✓'Taro's dog(s) and Hanako's dog(s) T+H > dog

(2) ***Dake* blocks distributive reading of possessors:**

太郎 と 花子 だけ の 犬
tarō to hanako dake no inu
Taro and Hanako DAKE GEN dog

✓'The dog(s) that belong precisely to Taro, Hanako, and noone else.' dog > T+H
* 'Taro's dog(s) and Hanako's dog(s), but noone else's dogs' T+H > dog

(3) **The *dake* blocking effect** (first description):
A quantifier Q which is in the semantic focus of *dake* cannot take wide scope with respect to any scope-bearing operator outside of *dake*.

$$[\,[\,[\,\ldots\,[\,Q\,]_F\,\ldots\,]\ \textit{dake}\,]\,\ldots\,\alpha\,] \quad \Rightarrow \quad {}^*Q > \alpha$$

But *dake* does not always have this effect:

(4) **A plural focus of *dake* that can take wide scope:**

太郎 と 花子 だけ と 遊び-たい。
tarō to hanako dake to asobi-tai
Taro and Hanako DAKE with play-want

✓'Only Taro and Hanako, λx . [I] want to play with x.' T+H > want
✓'[I] want to play with just Taro and Hanako.' want > T+H

2 Proposal

☞ ***Dake* itself takes scope at different positions:**
Sometimes the scope of DAKE is equivalent to its morphosyntactic position, while sometimes it is much higher (Futagi 2004, a.o.).

☞ **A general principle of focus interpretation:**
A quantifier Q which is within the focus of a focus-sensitive operator (Op below) cannot outscope that operator:

$$^*[\,Q_i\,\ldots\,[\,Op\,[\,\ldots\,t_{i,F}\,\ldots\,]\,]\,]$$

This principle will be derived as a corollary of Rooth's (1992) Focus Interpretation Principle, a standard assumption for modeling focus computation.

In other words, the wide-scope of T+H is available in (4) but not in (2) as DAKE itself can take a wider scope in (4) but not in (2). **What matters is not the morphosyntactic position of *dake* but its semantic scope.**

[1]I thank Irene Heim, Danny Fox, Chris Tancredi, Shigeru Miyagawa, and Kai von Fintel for thoughtful comments and constructive criticism. All shortcomings are of course my own.

2.1 Background: Alternative Semantics (Rooth, 1985, 1992)

The choice of semantic focus of a focus-sensitive operator is established via focus prosody (F-marking). This process is called ***Association with Focus*** (Jackendoff 1972; Rooth 1985).[2]

(5) **These sentences have different truth conditions (Rooth, 1985)**
   a. Mary only introduced [Bill]$_F$ to Sue.
   b. Mary only introduced Bill to [Sue]$_F$.

'Only' presupposes that the stated expression is true and asserts that all other **alternatives** in the set of alternatives are false (Horn, 1969; Rooth, 1985):

(6) $\overset{\frown}{\text{ONLY}}\ \alpha$ evaluated against world w_0
   presupposes: $[\![\alpha]\!]^I(w_0)$
   asserts: $\forall\phi \in [\![\alpha]\!]^A[\phi \neq [\![\alpha]\!]^I \rightarrow \neg\phi(w_0)]$
   where $[\![\alpha]\!]^I$ is the *ordinary (intensional) semantic value* and $[\![\alpha]\!]^A$ is the *focus semantic value* of α.

The focus semantic value $[\![\alpha]\!]^A$ is the set of alternatives and includes $[\![\alpha]\!]^I$. It is computed compositionally: for a terminal γ, if it is not F-marked, $[\![\gamma]\!]^A = \{[\![\gamma]\!]^I\}$; if γ is F-marked, $[\![\gamma]\!]^A$ is the set of alternatives to α, $D_{\text{typeof}([\![\gamma]\!]^I)}$.

The alternatives $[\![\alpha]\!]^A$ must satisfy the Focus Interpretation Principle:

(7) **Focus Interpretation Principle (FIP; Rooth 1992)** (simplified[3]):
   The alternatives considered $[\![\alpha]\!]^A$ must include an element which is not the ordinary semantic value: $\exists\beta \in [\![\alpha]\!]^A[\beta \neq [\![\alpha]\!]^I]$

The FIP is normally satisfied simply by something within α being F-marked.

[2]Even though *dake* is a constituent-'only,' it also utilizes Association with Focus as its semantic focus can also be prosodically conditioned:

a. [太郎]$_F$ の 犬 だけ 見-た
   tarō no inu dake mi-ta
   Taro GEN dog DAKE see-PAST
   'I saw only [Taro's]$_F$ dog... (not anyone else's dog)'

b. 太郎 の [犬]$_F$ だけ 見-た
   tarō no inu dake mi-ta
   Taro GEN dog DAKE see-PAST
   'I saw only Taro's [dog]$_F$... (not Taro's other animals)'

[3]Rooth (1992) makes a distinction between the focus semantic value $[\![\alpha]\!]^A$ and the set of alternatives, which he calls C to indicate that it is contextually determined. As such, Rooth's (1992) FIP requires first that $C \subseteq [\![\alpha]\!]^A$, together with the equivalent of the FIP above, that C must contain at least one other alternative beside $[\![\alpha]\!]^I$.

2.2 The different scopes of *dake*

It is well known that *dake* can sometimes take scope above sentential operators such as modals (Futagi, 2004; Harada and Noguchi, 1992; Kuno and Monane, 1979; Shoji, 1986):

(8) ***Dake* with postposition can scope above the modal:** (cf 4)

   太郎 だけ と 遊び-たい
   tarō dake to asobi-tai
   Taro DAKE with play-want

   ✓'[I] want to play with only Taro' want > only
   ✓'[I] only want to play with Taro.' only > want

(9) ***Dake* in possessor cannot scope above the modal:** (cf 2)

   太郎 だけ の 犬 と 遊び-たい
   tarō dake no inu to asobi-tai
   Taro DAKE GEN with play-want

   ✓'[I] want to play with the dog that is only Taro's' want > only
   * 'The only dog I want to play with is Taro's.' only > want

In (4, 8), *dake* is able to take wide scope above the sentential modal and "Taro and Hanako" is able to as well. In (2, 9), *dake* is unable to take scope over the modal and "Taro and Hanako" must have narrow scope as well.[4] In other words, **the scope of "Taro and Hanako" is limited by the scope of *dake***:

(10) **The *dake* blocking effect** (better description):
   A quantifier Q which is in the semantic focus of *dake* cannot take wide scope with respect to any scope-bearing operator outside of the semantic scope of *dake*:

$$[\,[\,[\,[\,[\,\ldots[\,Q\,]_F\ldots\,]\text{ "dake" }]\ldots\beta\,]\ldots\text{scope of }\textit{dake}\,]\ldots\alpha\,]$$
$$\Rightarrow\quad {}^{*}Q > \alpha,\ {}^{ok}Q > \beta$$

[4]The analysis presented here does not depend on a particular characterization of why *dake* can take wide scope in some positions but not in others. See Futagi (2004) and references therein for a variety of approaches.

2.3 A general theorem of focus interpretation

Theorem: Node χ is contained within the semantic focus of a focus-sensitive operator Op. If χ moves to a position outside of the scope of Op, the resulting structure will be uninterpretable. If χ moves within the scope of Op, it is interpretable.

Proof: Consider the two different configurations of movement:

χ moving out of the scope of Op:

(11) [$\chi_{i,F}$ [λ_i ... [Op [$_\alpha$ ... [... t_i ...]$_F$]]]]

- The trace t_i's ordinary semantic value is simply a variable (say, x) and the movement of χ to the higher position introduces a λ-binder which binds that variable (Heim and Kratzer, 1998).

☞ **The focus semantic value of a trace is simply the singleton of the variable** $[\![[t_i]_F]\!]^A = \{[\![[t_i]]\!]\} = \{x\}$.[5] The alternative set $[\![\alpha]\!]^A$ then will only have one element.

- Recall that the Focus Interpretation Principle requires that $[\![\alpha]\!]^A$ contain at least one element distinct from $[\![\alpha]\!]^I$, so $[\![\alpha]\!]^A$ must have more than one element.

∴ **(11) violates the FIP and is ungrammatical.**

χ moving within the scope of Op:

(12) [Op [$_\alpha$ ... [$\chi_{i,F}$ [λ_i ... [... t_i ...]$_F$]]]]

$[\![[t_i]_F]\!]^A$ is still the singleton set of the trace variable. However, that variable is bound by the quantifier and its λ-binder. The moved χ is F-marked and introduces multiple alternatives. $[\![\alpha]\!]^A$ then will satisfy the FIP. □

The *dake* blocking effect is simply a special case of this theorem.

[5] Consider other potential alternatives for $[\![[t_i]_F]\!]^A$:

a) $[\![[t_i]_F]\!]^A = D_{\text{typeof}([\![t_i]\!]^I)}$. Then it is a set of elements which do not involve variables and the moved χ and its λ-binder will no longer bind any variable, triggering the ban on vacuous quantification.

b) $[\![[t_i]_F]\!]^A = \{x_0, x_1, x_2, ...|\text{typeof}(x_i) = \text{typeof}([\![[t_i]_F]\!]^I)\}$, a set of different variables of the same type as t_i. However, in this case all the alternatives which are not the ordinary semantic value will end up with a free variable and will not be interpretable.

2.4 Explaining the PLA

The theorem above also explains Tancredi's (1990) Principle of Lexical Association, which was proposed to explain data such as (14):

(13) **The Principle of Lexical Association (PLA)** (Tancredi, 1990):
An operator like "only" must be associated with a lexical constituent in its c–command domain [at S-structure].

(14) * Who$_i$ did Bill only see [t$_i$]$_F$?

Aoun and Li (1993) argue that the PLA must be active at LF as well, citing QR data:

(15) Aoun and Li (1993, p. 207):

a. Someone loves every boy in the room. ($\exists > \forall, \forall > \exists$)

b. Someone only loves every boy in the room. ($\exists > \forall, *\forall > \exists$)
(...instead of everyone in the room, boy and girl)

However, Tancredi (1990) and Aoun and Li (1993) did not study cases of quantifiers raising *within* the scope of the focus-sensitive operator nor do they give a principled account for why this effect occurs. These are the primary theoretical contributions of this study.

3 Application: modeling *dake* + *shika*

Japanese has another 'only' word: *shika*. Unlike *dake*, *shika* is an NPI.

(16) **Japanese "only" items: *dake* (not polarity-sensitive) and *shika* (NPI)**

a. 太郎 は　寿司　だけ　(を)　食べ-る。
tarō wa　sushi dake o　tabe-ru
taro -TOP sushi DAKE -ACC eat-T
≈ 'Taro eats only sushi.'

b. 太郎 は　寿司　(を) しか　(*を)　食べ-ない。
tarō wa　sushi o　shika (*o)　tabe-nai
taro -TOP sushi ACC SHIKA (*ACC) eat-NEG
≈ 'Taro eats only sushi.'

Interestingly, a variant of (16a–b) with both *dake* and *shika* is also available.

(17) **Stacking of *dake* and *shika* (still an NPI)**

太郎 は　寿司　だけ　(を)　しか　食べ-ない。
tarō wa　sushi dake o　shika tabe-nai
taro -TOP sushi DAKE -ACC SHIKA eat-NEG
≈ 'Taro eats only sushi.'

Question: Does *dake* + *shika* (17) mean the same as just *dake* (16a) or just *shika* (16b)?

3.1 When *dake+shika* isn't just *shika*

☞ In some situations, *dake+shika* results in different entailments than when just using *shika*.

(18) a. **shika:**
太郎 と　花子　　から　しか　逃げ-ない
Tarō to　Hanako kara　shika nige-nai
Taro and Hanako from SHIKA run=away-NEG
≈ '[I] only run away from Taro and Hanako'

b. **dake+shika:**
太郎 と　花子　　だけ　から　しか　逃げ-ない
Tarō to　Hanako dake kara　shika nige-nai
Taro and Hanako DAKE from SHIKA run=away-NEG
≈ '[I] only run away from only Taro and Hanako'

Here is the behavior I would expect of the speakers of (18):

predator	(18a) *shika*	(18b) *dake+shika*
Taro	run away!	**no**
Hanako	run away!	**no**
Jiro (someone else)	no	no
Taro + Hanako	run away!	run away!

When we add *dake*, we rule out subsets (and supersets) of the stated predators.

3.2 Computing *dake+shika*

Given the *dake* blocking effect, we must consider:

a) the potential scopes of the plural distributor "Taro and Hanako"; and

b) the scope of the relevant *dake*.

☞ The sentences in (18) involve a *generic operator*.[6] Assume "I run away from Taro" is equivalent to "when Taro comes after me, I run away," i.e. we quantify over situations which satisfy the presuppositions of "run away from X."

Consider (18a) using a distributive operator DIST for the plural "Taro and Hanako":

(18a') *shika* > plural-DIST > generic:
Let $f = \lambda x$.when x comes after me, I run away.
$\forall \phi \in \{$DIST f(Taro $\oplus$ Hanako), DIST f(Taro), DIST f(Hanako), DIST f(Jiro),...$\}$
$= \{f(\text{Taro}) \wedge f(\text{Hanako}), f(\text{Taro}), f(\text{Hanako}), f(\text{Jiro}),...\}$
if DIST f(Taro $\oplus$ Hanako) = f(Taro) $\wedge$ f(Hanako) does not entail ϕ, ϕ is false.

This correctly models (18a), so **DIST can take scope over the generic**.

[6] Thanks to Irene Heim for pointing out the importance of the interaction with the generic here.

Now we must identify the scope of *dake* in (18b). From the entailments of the simplified sentence (19), we learn that **the *dake* scopes below the generic**.

(19) 太郎 だけ から しか 逃げ-ない
Tarō dake kara shika nige-nai
Taro DAKE from SHIKA run=away-NEG
≈ '[I] only run away from only Taro'

predator	(19) *dake+shika*
Taro	run away!
Hanako	no
Taro + Hanako	no

(19′) *shika* > generic > *dake*:
Let $f' = \lambda x.$ when dake(x comes after me), I run away
$\approx \lambda x.$ when x comes after me but noone else does, I run away
$\forall \phi \in \{f'(\text{Taro} \oplus \text{Hanako}), f'(\text{Taro}), f'(\text{Hanako}), f'(\text{Jiro}),...\}$
if $f'(\text{Taro})$ does not entail ϕ, ϕ is false.

As $f'(\text{Taro})$ does not entail $f'(\text{Taro} \oplus \text{Hanako})$, $f'(\text{Taro} \oplus \text{Hanako})$ is explicitly asserted by (19) to be false.

☞ Even though the plural-DIST can scope over the generic (18a), the *dake* blocking effect tells us that **the plural-DIST must remain within the scope of *dake***.

(18b) 太郎 と 花子 だけ から しか 逃げ-ない
Tarō to Hanako dake kara shika nige-nai
Taro and Hanako DAKE from SHIKA run=away-NEG
≈ '[I] only run away from only Taro and Hanako'

(18b′) *shika* > generic > *dake* (> plural-DIST):
$\forall \phi \in \{f'(\text{Taro} \oplus \text{Hanako}), f'(\text{Taro}), f'(\text{Hanako}), f'(\text{Jiro}),...\}$
if $f'(\text{Taro} \oplus \text{Hanako})$ does not entail ϕ, ϕ is false.

☞ As $f'(\text{Taro})$ and $f'(\text{Hanako})$ are not entailed by $f'(\text{Taro} \oplus \text{Hanako})$, (18b) explicitly asserts that they are false, **giving us the entailments observed.**

On the other hand, what if we let plural-DIST scope over the generic, as would be expected based on (18a), without the *dake* blocking effect?

(18b″) *shika* > plural-DIST > generic > *dake*:
$\forall \phi \in \{\text{DIST } f'(\text{Taro} \oplus \text{Hanako}), \text{DIST } f'(\text{Taro}), \text{DIST } f'(\text{Hanako}), \text{DIST } f'(\text{Jiro}),...\}$
$= \{f'(\text{Taro}) \wedge f'(\text{Hanako}), f'(\text{Taro}), f'(\text{Hanako}), f'(\text{Jiro}),...\}$
if DIST $f'(\text{Taro} \oplus \text{Hanako}) = f'(\text{Taro}) \wedge f'(\text{Hanako})$ does not entail ϕ, ϕ is false.

Of course, $f'(\text{Taro}) \wedge f'(\text{Hanako})$ entails $f'(\text{Taro})$ and $f'(\text{Hanako})$ so we are allowed to run away from just Taro and from just Hanako (indicated by the ☠ below). Thus, (18b″) gives us the wrong entailments for (18b):

predator	(18b) *dake+shika*	(18b″) computed w/o *dake* effect
Taro	**no**	☠ run away
Hanako	**no**	☠ run away
Jiro (someone else)	no	no
Taro + Hanako	run away!	run away!

3.3 Consequences: infelicitous uses of *dake+shika*

☞ We can now explain certain infelicitous uses of *dake+shika*, where the *shika* alternative is allowed:

(20) **Felicitous *shika* but not *dake+shika*:**
The detective: "Where is this man now?"

a. [彼-は 会社 に しか い-ない] と 思います。
Kare-wa kaisha ni shika i-nai to omoimasu
He-TOP company at SHIKA be-NEG C think
'I think he {is only / could only be} at the office.'

b. ?? [彼-は 会社 だけ に しか い-ない] と 思います。
Kare-wa kaisha dake ni shika i-nai to omoimasu
He-TOP company DAKE at SHIKA be-NEG C think
'I think he {is only / could only be} at the office.'

shika > *dake* with no intervening operator is at best redundant and at worst produces a vacuous assertion.[7] As there is no other scope-bearing operator in (20), the addition of *dake* in (20b) is at best unnecessary.

[7] Yoshimura (2007) proposes that *shika* is like English 'only,' in that it presupposes the prejacent (the stated value) and asserts the negative (exclusive) proposition, but that *dake* presupposes the exclusive proposition and asserts the prejacent.

We then predict that *dake+shika* will be felicitous if we introduce another scope-bearing operator, e.g. a plural subject or a tense which ranges over times:

(21) The detective: "Where are those men now?"

✓ [彼ら-は 会社 だけ に しか い-ない] と 思います。
karera-wa kaisha dake ni shika i-nai to omoimasu
they-TOP company DAKE at SHIKA be-NEG C think
'I think they {are only / could only be} at the office.'

(22) The detective: "Where was this man in the past day?"

✓ [彼-は 会社 だけ に しか い-なかっ-た] と 思います。
Kare-wa kaisha dake ni shika i-naka-tta to omoimasu
He-TOP company DAKE at SHIKA be-NEG-PAST C think
'I think he was only at the office.'

4 Conclusion

Today, I investigated one way in which **focus interpretation interacts with quantifier scope**, illustrated and motivated through the Japanese 'only' word *dake*. In particular,

- I presented **the *dake* blocking effect** and showed that it is a corollary of Rooth's (1992) **Focus Interpretation Principle**;
- showed how **this theorem explains previously described facts** such as Tancredi's (1990) Principle of Lexical Association;
- showed how this theorem can help accurately model the interpretation and grammaticality of **stacked 'only' (*dake+shika*) constructions** in Japanese.

The theorem presented here is expected to hold across languages and thus may help explain various scope facts in other languages. In addition, this constraint may be used as **a diagnostic for better studying the syntactic locality of focus**.

Yoshimura argues that this explains a variety of contrasts between *dake* and *shika* which have been described by Kuno (1999); Mogi (2001); a.o.

Using Yoshimura's (2007) formulation for *dake* and *shika*, an LF with *shika* > *dake* with no intervening operator would assert no more than it presupposes and thus be interpreted as a vacuous assertion.

Finally, note that the configuration which is ruled out by our theorem is very similar to the canonical configuration for **Focus Intervention Effects** (Beck, 2006; Pesetsky, 2000). Further study is warranted to understand this connection.

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