Focus interpretation and covert movement:
the *dake* blocking effect\(^\text{1}\)
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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
taro 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
taro to hanako dake no inu
Taro and Hanako *dake* *gen* dog

\(^{1}\)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.

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*.

\[ [ [ ... [ Q ] ... ] dake ] ... \alpha ] \Rightarrow \alpha > Q \]

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。
taro 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:

\[ ‘[ Q_l . . . [ Op [ ... t_{l,F} ... ] ] ] \]

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.**
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).

(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) Only $\alpha$ evaluated against world $w_0$
   presupposes: $[\alpha]^4(w_0)$
   asserts: $\forall \alpha \subseteq [\alpha]^4: \phi \neq [\alpha]^4 \rightarrow \neg \phi(w_0)$
   where $[\alpha]^4$ is the ordinary (intensional) semantic value and $[\alpha]^4$ is the focus semantic value of $\alpha$.

The focus semantic value $[\alpha]^4$ is the set of alternatives and includes $[\alpha]^I$. It is computed compositionally: for a terminal $\gamma$, if it is not F-marked, $[\gamma]^4 = ([\gamma]^I]$; if $\gamma$ is F-marked, $[\gamma]^4$ is the set of alternatives to $\alpha$, $D_{\text{type}(\gamma)}$.

The alternatives $[\alpha]^4$ must satisfy the Focus Interpretation Principle:

(7) Focus Interpretation Principle (FIP; Rooth 1992) (simplified$^3$):
   The alternatives considered $[\alpha]^4$ must include an element which is not the ordinary semantic value: $\exists \beta \in [\alpha]^4: \beta \neq [\alpha]^I$.

The FIP is normally satisfied simply by something within $\alpha$ 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. 太郎だけと遊ぶたい
   b. 太郎だけ遊ぶたい
   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

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

太郎だけと遊ぶたい
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)

太郎だけの犬と遊ぶたい
 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:

\[
[ \{ \{ \ldots [Q] \ldots \} \ldots \} \ldots \text{scope of } dake \} \ldots \alpha ] \Rightarrow \text{only } Q > \alpha, Q \neq \beta
\]

$^3$Rooth (1992) makes a distinction between the focus semantic value $[\alpha]^4$ 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 $C \subseteq [\alpha]^I$, together with the equivalent of the FIP above, that $C$ must contain at least one alternative besides $[\alpha]^I$.

$^4$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 $\chi$ is contained within the semantic focus of a focus-sensitive operator $Op$. If $\chi$ moves to a position outside of the scope of $Op$, the resulting structure will be uninterpretable. If $\chi$ moves within the scope of $Op$, it is interpretable.

**Proof:** Consider the two different configurations of movement:

- $\chi$ moving out of the scope of $Op$:

  $\chi_{\lambda_{\chi}} F [ \lambda \ldots [ Op [ t \ldots [ t_{i} \ldots ] ] ] ]$

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

  - The focus semantic value of a trace is simply the singleton of the variable $[[t_{i}]]^{A} = \{[[t_{i}]]\} = \{x\}$. 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.

  $\vdash$ (11) violates the FIP and is ungrammatical.

- $\chi$ moving within the scope of $Op$:

  $Op [ t \ldots [ \chi_{\lambda_{\chi}} F [ \lambda \ldots [ t_{i} \ldots ] ] ] ]$

  $[[t_{i}]]^{A}$ is still the singleton set of the trace variable. However, that variable is bound by the quantifier and its $\lambda$-binder. The moved $\chi$ is F-marked and introduces multiple alternatives. $[[\alpha]]^{A}$ then will satisfy the FIP. \[\square\]

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

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 constituent domain [at S-structure].

(14) * Who, did Bill only see \( t_{i} \)?

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. \( \exists x > \forall, \forall > \exists \)

b. Someone only loves every boy in the room. \( \exists > \forall, \forall > \exists \)

\((\ldots\text{instead of everyone in the room, boy and girl})\)

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.

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*(Consider other potential alternatives for $[[t_{i}]]^{A}$:*

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

b) $[[t_{i}]]^{A} = \{x_{0}, x_{1}, x_{2}, \ldots | \text{typeof}(x_{i}) = \text{typeof}([[t_{i}]]^{A})\}$, 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.
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):

<table>
<thead>
<tr>
<th>predator</th>
<th>(18a) shika</th>
<th>(18b) dake+shika</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taro</td>
<td>run away!</td>
<td>no</td>
</tr>
<tr>
<td>Hanako</td>
<td>run away!</td>
<td>no</td>
</tr>
<tr>
<td>Jiro (someone else)</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Taro + Hanako</td>
<td>run away!</td>
<td>run away!</td>
</tr>
</tbody>
</table>

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 distribut “Taro and Hanako”; and
b) the scope of the relevant dake.

The sentences in (18) involve a generic operator. 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. \text{ when } x \text{ comes after me, I run away.} $

$\forall \phi \in \{ \text{dist } f(\text{Taro} \oplus \text{Hanako}), \text{dist } f(\text{Taro}), \text{dist } f(\text{Hanako}), \text{dist } f(\text{Jiro}), \ldots \}$

$= \{ f(\text{Taro}) \land f(\text{Hanako}), f(\text{Taro}), f(\text{Hanako}), f(\text{Jiro}), \ldots \}$

if dist $f(\text{Taro} \oplus \text{Hanako}) = f(\text{Taro}) \land f(\text{Hanako})$ does not entail $\phi$, $\phi$ is false.

This correctly models (18a), so [dist can take scope over the generic]

*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

**dake scopes below the generic**

<table>
<thead>
<tr>
<th>(19)</th>
<th>dake+shika</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taro</td>
<td>run away!</td>
</tr>
<tr>
<td>Hanako</td>
<td>no</td>
</tr>
<tr>
<td>Taro + Hanako</td>
<td>no</td>
</tr>
</tbody>
</table>

(19') shika > generic > dake:

Let \( f' = \lambda x. \text{when dake comes after me}, \) I run away

\( \forall \phi \in \{ f'(\text{Taro} \oplus \text{Hanako}), f'(\text{Taro}), f'(\text{Hanako}), f'(\text{Jiro}), \ldots \} \)

if \( f'(\text{Taro}) \) does not entail \( \phi \) then \( \phi \) 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.

\( \triangleright \) 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 避けない

Taro and Hanako dake shika nigai-nai

\( \approx \{ \text{‘[I] only run away from only Taro’} \} \)

(18b') shika > generic > dake (> plural-dist):

\( \forall \phi \in \{ f'(\text{Taro} \oplus \text{Hanako}), f'(\text{Taro}), f'(\text{Hanako}), f'(\text{Jiro}), \ldots \} \)

if \( f'(\text{Taro} \oplus \text{Hanako}) \) does not entail \( \phi \) then \( \phi \) is false.

\( \triangleright \) 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:

\( \forall \phi \in \{ \text{dist} f'(\text{Taro} \oplus \text{Hanako}), \text{dist} f'(\text{Taro}), \text{dist} f'(\text{Hanako}), \text{dist} f'(\text{Jiro}), \ldots \} \)

if \( \text{dist} f'(\text{Taro} \oplus \text{Hanako}) \) 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 \( \triangleright \) below). Thus, (18b") gives us the wrong entailments for (18b):

<table>
<thead>
<tr>
<th>(18b) dake+shika</th>
<th>(18b&quot;) computed w/o dake effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taro</td>
<td>no</td>
</tr>
<tr>
<td>Hanako</td>
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3.3 Consequences: infelicitous uses of dake+shika

\( \triangleright \) 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 ni omoimasu
   He-top company at SHIKA be-NEG c think
   \( \text{‘I think he is only could only be] at the office.’} \)

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 ni omoimasu
   He-top company DAKE at SHIKA be-NEG c think
   \( \text{‘I think he is only could only be] at the office.’} \)

\( \text{shika > dake} \) 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.

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\(^7\)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。

kare- wa kaisha  dake ni shika i-nai  to omoimasu

They company dake at shika be-NEG 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 company dake at shika be-PAST NEG 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.

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.

References


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Tancredi, Chris. 1990. Not only even, but even only. MIT.