Japanese *Mo* 'Also': Anti-negative Scope and Inclusive Entailment

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1. Issue Under the standard analysis of the additive particle *mo* 'also', the noun phrase NP-*mo* has been treated as a quantificational expression triggering an additive presupposition, as defined in (1).

(1) $[\![John\text{-}mo]\!] = \lambda P.\ [P(\mathbf{j})]$
$[\![John\text{-}mo]\!](P)$ presupposes $\exists x.\ [x \neq \mathbf{j} \wedge P(x)]$.

One puzzle for this standard analysis is that NP-*mo* shows anti-negativity, as noted by Hasegawa (1991), which means that it cannot occur in the immediate scope of negation (Neg). For example, consider (2).

(2)	*John-**<u>mo</u>***	*hasira-**nakat**-ta.*	a. NP-*mo* > Neg: $[\![John\text{-}mo]\!]([\![\boldsymbol{not}]\!]([\![run]\!]))$
	John-also	run-Neg-Past	b. * Neg > NP-*mo*: $[\![\boldsymbol{not}]\!]([\![John\text{-}mo]\!]([\![run]\!]))$

In (2), we can get the (a) reading, which asserts that John didn't run, while presupposing that someone else didn't run, but we cannot get the (b) reading, which is supposed to assert that John didn't run, while presupposing that someone else ran. This point is demonstrated by the contrast between (3) and (4).

(3)	*Kyo-wa*	*Bill-ga*	*hasira-**nakat**-ta.*	*Sosite*	*John-**<u>mo</u>***	*hasira-**nakat**-ta.*
	today-Top	Bill-Nom	run-Neg-Past	and	John-also	run-Neg-Past

'Today, Bill didn't run, and John also didn't run.'

(4)	* *Kyo-wa*	*Bill-ga*	*hasit-ta.*	*Sosite*	*John-**<u>mo</u>***	*hasira-**nakat**-ta.*
	today-Top	Bill-Nom	run-Past	and	John-also	run-Neg-Past

'Today, Bill ran, and John also didn't run.'

Still, under (1), the (b) reading should be available if it is computed in a strictly compositional fashion, that is, if the presupposition of a constituent is inherited by a larger constituent, as shown in (5).

(5) $[\![not]\!]([\![John\text{-}mo]\!]([\![run]\!])) = \neg\mathbf{run}(\mathbf{j})$
$[\![John\text{-}mo]\!]([\![run]\!])$ presupposes $\exists x.\ [x \neq \mathbf{j} \wedge \mathbf{run}(x)]$.

The impossibility of this interpretation is what we call anti-negativity, and it has been discussed in the literature. Among others, Miyagawa (2010) proposes a syntactic account, under which any focused XP, including NP-*mo*, must be scrambled to the edge of TP (and this can be string-vacuous), so that it must be interpreted above the scope of Neg. However, this account is faced with is a problem. Consider (6).

(6)	*Zen'in-**<u>wa</u>***	*hasira-**nakat**-ta.*	a. * UQ-*wa* > Neg: $[\![everyone\text{-}wa]\!]([\![\boldsymbol{not}]\!]([\![run]\!]))$
	everyone-Top	run-Neg-Past	b. Neg > UQ-*wa*: $[\![\boldsymbol{not}]\!]([\![everyone\text{-}wa]\!]([\![run]\!]))$

In (6), the universal quantifier (UQ) is focused due to the presence of the contrastive particle *wa*, and must take scope below Neg. This is unexpected under the syntactic account, as the focus nature of UQ-*wa* would require it to go to the edge of TP. On the other hand, Hara (2006) has derived the negativity of UQ-*wa* in purely semantic terms. Our goal is to do the same thing to the anti-negativity of NP-*mo*.

2. Claim Szabolcsi (2015) proposes a general semantic theory of *mo* and its crosslinguistic counterparts, under which they impose a *postsupposition*, namely a proposition that needs to be entailed by the output context resulting after their at-issue content is incorporated. Thus, in (3), *mo* should derive, not only an at-issue proposition (i.e., $\neg\mathbf{run}(\mathbf{j})$), but also a proposition entailed by the output context, which at least consists of the first and second clauses (i.e., $\neg\mathbf{run}(\mathbf{b}) \wedge \neg\mathbf{run}(\mathbf{j})$). Along these lines, we propose the semantics of *mo* as shown in (7), where K, K' are quantifier variables (type **<<e, t>, t>**).

(7) $[\![mo]\!] = \lambda K.\lambda P.\ [K(P)]$
$[\![mo]\!](K)(P)$ postsupposes $\exists K'.\ [\overbrace{K' \subsetneq K}^{(a)} \wedge \overbrace{\Diamond K'(P)}^{(b)}]$.

The postsupposition of $[\![mo]\!](K)(P)$ is satisfied iff the output context entails that there is an alternative K' such that (a) K' is more inclusive than K, and (b) $K'(P)$ can be true. Importantly, (7a) requires K' to be distinct from and stronger than K. For example, (7b) is true if $K' = [\![everyone]\!]$ and $K = [\![someone]\!]$, but not vice versa. Thus, the proposition $K'(P)$ is inclusive in the sense that it entails the at-issue proposition $K(P)$. We now show how to derive the anti-negativity of NP-*mo* in (4), assuming with Partee (1987) that any expression of type **e** can be type-shifted to a quantifier, that is, the set of predicates that hold for the entity in question (e.g., $[\![John]\!] = \lambda P.\ [P(\mathbf{j})]$, $[\![Bill\ \&\ John]\!] = \lambda P.\ [P(\mathbf{b}) \wedge P(\mathbf{j})]$). Suppose that the subject NP-*mo* may freely stay in situ within VP or undergo scrambling over Neg into TP (e.g., Kuroda 1988). Given this assumption, let us consider when NP-*mo* is at the edge of TP as shown in (8).

(8) $[_{\mathrm{TP}}$ *John-mo* $[_{\mathrm{T'}}$ ***not*** *run*]], where $[\![\textit{\textbf{not}}\ run]\!] = \lambda x.\ [\neg\mathbf{run}(x)]$.

Then, under (7), the at-issue content and postsupposition are determined as shown in (9) and (10).

(9) $[\![mo]\!]([\![John]\!])([\![\textit{\textbf{not}}\ run]\!]) = [\![John]\!]([\![\textit{\textbf{not}}\ run]\!]) = \neg\mathbf{run}(\mathbf{j})$

(10) $[\![mo]\!]([\![John]\!])([\![\textit{\textbf{not}}\ run]\!])$ postsupposes $\exists K'.\ [K' \subsetneq [\![John]\!] \wedge \Diamond K'([\![\textit{\textbf{not}}\ run]\!])]$.

Postsupposition (10) is met in (3) (but not in (4)), as the output context of (3) is $\neg\mathbf{run}(\mathbf{b}) \wedge \neg\mathbf{run}(\mathbf{j})$. For example, suppose $K' = [\![Bill\ \&\ John]\!] = \lambda P.\ [P(\mathbf{b}) \wedge P(\mathbf{j})]$ (stronger than $[\![John]\!]$), then the postsupposition amounts to saying that there is a possibility that $\neg\mathbf{run}(\mathbf{b}) \wedge \neg\mathbf{run}(\mathbf{j})$, which indeed holds in the output context of (3). On the other hand, what happens if NP-*mo* is at the edge of VP, as shown in (11)?

(11) [***not*** $[_{\mathrm{VP}}$ *John-mo run*]], where $[\![run]\!] = \lambda x.\ [\mathbf{run}(x)]$.

In this case, the at-issue content and postsupposition are determined as shown in (12) and (13).

(12) $[\![\textit{\textbf{not}}]\!]([\![mo]\!]([\![John]\!])([\![run]\!])) = \neg([\![John]\!]([\![run]\!])) = \neg\mathbf{run}(\mathbf{john})$

(13) $[\![mo]\!]([\![John]\!])([\![run]\!])$ postsupposes $\exists K'.\ [K' \subsetneq [\![John]\!] \wedge \Diamond K'([\![run]\!])]$.

Postsupposition (13) is not met in (4) (and not in (3)), as the output context of (4) is $\mathbf{run}(\mathbf{b}) \wedge \neg\mathbf{run}(\mathbf{j})$. To illustrate, suppose $K' = [\![Bill\ \&\ John]\!] = \lambda P.\ [P(\mathbf{b}) \wedge P(\mathbf{j})]$, then the postsupposition amounts to saying that there is a possibility that $\mathbf{run}(\mathbf{b}) \wedge \mathbf{run}(\mathbf{j})$, which is a possibility contradicting the output context of (4). Thus, if NP-*mo* is placed under the scope of Neg, it ends up with a contradictory postsupposition.

3. Support Our proposal in (7) makes further predictions. For example, consider the contrast below.

(14) * *Bill-wa* *hasit-ta-kedo*, [*John-**mo*** *hasitte-**nakat**-ta*]*-yo*.
Bill-Top run-Past-but John-also run-Neg-Past-End.particle
'Bill ran, but John also didn't run.'

(15) *Bill-wa* *hasit-ta-kedo*, [*John-**mo*** *hasitte-**nakat**-ta*]*-ra* *Mary-ga* *komar-u*.
Bill-Top run-Past-but John-also run-Neg-Past-if Mary-Nom in.trouble-Pres
'Bill ran, but if John also didn't run, Mary will be in trouble.'

While (14) is ruled out for the same reason as (4) is, (15) is ruled in, where the NP-*mo* clause is embedded in a conditional antecedent (e.g., Hasegawa 1991). (15) is accepted, because the postsupposition in (13) is entailed by the output context of (15), whose content is shown in (16). That is, since $[p \rightarrow q]$ is true iff $[\neg p \vee q]$ is true, the output context is regarded as including a possibility that $\mathbf{run}(\mathbf{b}) \wedge \mathbf{run}(\mathbf{j})$.

(16)
$$\begin{array}{lll} & \mathbf{run}(\mathbf{b}) \wedge [\neg\mathbf{run}(\mathbf{j}) \rightarrow \mathbf{in.trouble}(\mathbf{m})] & (p \rightarrow q \leftrightarrow \neg p \vee q) \\ = & \mathbf{run}(\mathbf{b}) \wedge [\neg\neg\mathbf{run}(\mathbf{j}) \vee \mathbf{in.trouble}(\mathbf{m})] & (\neg\neg p \leftrightarrow p) \\ = & \mathbf{run}(\mathbf{b}) \wedge [\mathbf{run}(\mathbf{j}) \vee \mathbf{in.trouble}(\mathbf{m})] & (p \wedge [q \vee r] \leftrightarrow [p \wedge q] \vee [p \wedge r]) \\ = & [\mathbf{run}(\mathbf{b}) \wedge \mathbf{run}(\mathbf{j})] \vee [\mathbf{run}(\mathbf{b}) \wedge \mathbf{in.trouble}(\mathbf{m})] & \end{array}$$

4. Conclusion We have proposed a postsuppositional account of the anti-negativity of NP-*mo*, making a further correct prediction. If our account is on the right track, then the nature of NP-*mo* makes no argument for the idea that Japanese scrambling is focus-driven. Or Miyagawa's (2010) approach may be right, but it must admit that any focused XP undergoing focus-driven scrambling can be reconstructed into its base position in principle, so that we can capture both the scope facts given in (2) and (6).

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