

## Negative Islands, Gradable Predicates, and Discreteness of Measurement in Japanese

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**Introduction.** Degree questions in Japanese (J) display the negative island (NI) effect familiar from English (E). Just as in E ([1]), in J the effect can be obviated by modal expressions. Our new observation is that NIs in J are obviated by the particle *wa*. We offer an analysis of this pattern: inspired by [2], we propose that gradable predicates in J have an *exactly*-semantics of the sort employed for E in [3] (alternatively: an interval semantics; see [2], [4]), but that an *at least* semantics can be derived by *wa*. This helps derive NI obviation by *wa* under the assumption that question denotations are presupposed to contain a maximally informative true answer ([1], [2]). More accurately, obviation is derived under the assumption that all scales can be treated as discrete in J, which is in direct opposition to [1], who argue for universal density of scales based on E data.

**Obviation by *wa*.** The contrast between (1) and (2) shows that J patterns with E in displaying the NI effect ([1]-[4]). What makes J data interesting is that, as illustrated by the fully acceptable (3), NIs can be obviated by the particle *wa* attaching to the degree predicate.

- (1) Doitu-ni doredake nagaku taizaisimasu ka?  
Germany-in how long stay Q  
'How long will you stay in Germany?'
- (2) \*/?? Doitu-ni doredake nagaku taizaisimasen ka?  
Germany-in how long stay.not Q
- (3) Doitu-ni doredake nagaku-wa taizaisimasen ka?  
Germany-in how long-WA stay.not Q  
'How long-WA will you not stay in Germany?'

While the best-known function of *wa* is that of a topic marker, the particle has a wider range of functions which are currently under investigation (e.g. [5], [6], [7]). The NI obviating potential of *wa*, however, does not seem to have been noted before.

**A case of modal obviation?** J also allows for so-called modal obviation of NIs, familiar from E ([1], [2], [4]). In particular, as (4) illustrates, addition of a wide scope epistemic necessity operator renders (1) acceptable.

- (4) Doitu-ni doredake nagaku taizaisinai koto-ga kakuzitu-desu ka?  
Germany-in how long stay.not KOTO-NOM certain-COP Q  
'How long are you sure you will not stay in Germany?'

One account that comes to mind interprets NI obviating *wa* as a wide scope epistemic necessity operator, so that any analysis of modal obviation carries over to *wa*-obviation. However, such an epistemic interpretation of *wa* seems to lack independent support. Also, given the general scope rigidity in J, one would expect locality effects that are not in fact attested. In (5), for example, *wa* obviates the NI despite being separated from the higher negation by a clause boundary. An epistemic necessity analysis must stipulate that *wa* can scope non-locally out of the embedded clause.

- (5) Hikoku-wa [doitu-ni doredake nagaku??(-wa) taizaisita to] syutyooosimasendesita ka?  
defendant-TOP Germany-in how long-WA stayed that didn't.claim Q  
'How long ??(-WA) did the defendant not claim that he stayed in Germany?'

**An alternative.** We take our cue for an alternative analysis from the observation, illustrated in (6), that certain occurrence of *wa* can be glossed as *at least* or *or more* (e.g. [5], [6]).

- (6) Taro-wa haiku-o itu-tu-wa tukutta/tukuranakatta.  
Taro-TOP haiku-ACC 5-CL-WA made/didn't.make  
'Taro made/didn't make five or more haiku.'

**Degree question architecture.** (1), (2), (4) suggest that J degree questions share a familiar grammatical make-up with their E counterparts: we take J degree questions to feature derived degree predicates like those in (1)', (2)', (4)'. These express functions mapping degrees to possible answers.

- (1)'  $\lambda d[\text{YOU STAY [d LONG] IN GERMANY}]$   
 (2)'  $\lambda d[\text{NOT [YOU STAY [d LONG] IN GERMANY]} ] ]$   
 (4)'  $\lambda d[ \square [\text{NOT [YOU STAY [d LONG] IN GERMANY]} ] ]$

Maximality under an *exactly*-semantics. Following [1] and [2], we take questions to presuppose that their answer sets contain a unique maximally informative true answer. As noted in [2], this condition predicts the contrast between (non-modalized) positive and negative degree questions if gradable predicates are assigned an *exactly* semantics (see [3]), as in (7).

- (7)  $|\text{LONG}| = \lambda e.\lambda d. e\text{'s length} = d$

Under (7), (1)' generates a unique true answer, which specifies the exact number of days for which you will stay in Germany, guaranteeing satisfaction of maximality. In contrast, (2)' generates many true answers, one for each degree other than the exact number of days for which you will stay in Germany; these true propositions are not related by entailment, so maximality cannot be satisfied. Under an *exactly*- semantics, then, NI effects can be due to contradictory presuppositions. Moreover, as [2] also notes, the contradiction is predicted to dissipate in cases like (4); this is because it is possible for some number to be the only number of days which you are sure is not the exact number of days you will be staying in Germany. (4)' will then generate a unique true answer, just like (1).

*Wa* at least semantics. Inspired by data like (6), we propose to explain NI obviation by *wa* by letting the particle derive degree predicates with an *at least* semantics, as illustrated in (8).

- (8)  $|\text{LONG-WA}| = \lambda e.\lambda d. e\text{'s length} \geq d$

Under (8), the degree property in (3)' below can underlie a question satisfying maximality. This is so because the degree property in question will generate propositions that are related by entailment. More specifically, this degree property is strictly upward monotone, in the sense that it maps lower degrees to stronger propositions than higher degrees.

- (3)'  $\lambda d[\text{NOT [YOU STAY [d LONG-WA] IN GERMANY]} ]$

So the most informative answer will specify the lowest degree that the property maps to a true proposition. Assuming that length of stay is measured in days, and your stay in Germany will be, say, exactly nine days long, the most informative true proposition in the answer set will be the proposition that your stay will not be ten or more days long.

Discreteness of measurement. We have assumed that the length of stays in Germany is measured in days, i.e. that the scale in question is treated as discrete. Discreteness is indeed a necessary ingredient of the account, as otherwise maximality could not be satisfied ([1]). But NI obviation by *wa* is also found in cases of apparent scale density. Our proposal must posit that in such cases discreteness can nevertheless be accommodated. In this, our account is diametrically opposed to the groundbreaking proposal in [1], which posits scale density even in cases of apparent discreteness.

**Outlook.** (i) The position that J lexical degree predicates have an *exactly*-semantics may have to be revised. For example, while the maximality presupposition derived for (4) is satisfiable, it may still be too strong. One promising modification replaces the *exactly*-semantics with an interval semantics ([2],[4]), and lets *wa* perform downward closure of the intervals in question. (ii) Recent work discusses uses of *wa* that go beyond its well-known topic marking function ([5],[6],[7]). NI obviating *wa* can be added to the list, introducing a new desideratum for a complete unified theory of *wa*.

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