Complexity of Polarity Sensitivity: Japanese *-demo*

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Abstract

This paper examines the distribution of Japanese focus particle, *-demo*, and characterizes its status as a type of polarity sensitive items. The data demonstrates that its distribution is not that of either negative polarity items, which are often found in Japanese, or of affective polarity items, represented by English *any*. The data also demonstrates that the kind of polarity sensitivity is not language-specific but rather lexicon-specific. Given this observation, it is argued that the phenomenon of polarity items is more complicated and diverse than often presented to be in the literature within and across languages. Therefore, any kind of theory for the phenomenon of polarity needs to address this diversity. Given the two distinct types of judgments the PSIs discussed here receive, it is also suggested that this difference in judgment should also reflect the kind of treatment it should receive in the theory, i. e. how and where in grammar they are governed.

1．Introduction

One of the tasks of the study of linguistics has been to identify, characterize, and explain the distribution of certain lexical items. On that respect, Polarity Sensitive Items（henceforth PSIs）, such as English *any*, have received much attention in the field due to their distinct and puzzling distributions（Klima 1964, Ladusaw 1979, Linebarger 1980, Zwarts 1993, von Fintel 1999）. The phenomenon of polarity sensitivity is observed widely in natural languages, e. g. German, Dutch, Spanish, Greek, Hindi, Korean（Rullmann 1997, 2003, Giannakidou 1998, 2007, Lahiri 1998, Lee and Horn 1994）. Japanese is no exception with the intensive studies done on items such as *-shika* "only" and *dare-mo* "anyone", whose distributions are typically that of Negative Polarity Items（henceforth NPIs）（Kato 1994, 2000）. Due to their strong NPI property in the sense of Zwarts（1993）, i. e. NPIs are only licensed with the presence of clause-bound negation, Japanese is often believed to be a language which utilizes strong NPI types, differing from languages which demonstrate diversity in polarity sensitivity.

In this paper, it is demonstrated that this is not the whole picture of Japanese and that Japanese also contains items that display complex polarity sensitivity. In particular, the focus particle *-demo* with a minimal quantity expression is examined here to illustrate this point. Although it is shown that its distribution is different from that of English *any*, demonstrating its distinct polarity sensitivity, it is also noted that a similar distribution is observed in Greek, illustrating some regularity in its distribution（Giannakidou 1998）. While accounting for its distribution is out of the scope of this paper, it is a novel discovery that there is diversity and regularity in the types of polarity sensitive items within and across languages. It illustrates the complexity of the polarity sensitivity phenomena. Further, the study demonstrates that the kind of polarity sensitivity is

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not language-specific, but rather lexicon-specific. In other words, one cannot claim that Japanese is a strong NPI type language, but should recognize that each lexical item displays different polarity sensitivity.

This paper is organized as follows. Section 2 provides a brief overview of the polarity phenomena with some previous relevant accounts. Section 3 provides the Japanese data in question and illustrates the peculiarity of the data while pointing out its particular polarity sensitivity. Section 4 provides the discussion for the given data and its implications to the theory of polarity. Section 5 summarizes the findings and concludes the paper.

2．**Overview of Polarity Sensitive Items, their Distributions, and Previous Accounts**

PSIs are expressions, either words or phrases, whose distributions are limited to certain environment, often characterized as the 'polarity' context. The term is broadly defined so as to include items that are licensed with negation（NPIs）, items that are licensed in positive context（Positive Polarity Items）, and items that are licensed more freely yet limited（Affective Polarity Items borrowing the term from Klima 1964）. The most well known and studied case is the English *any*, which is often mislabeled as an NPI. This is because the initial observation was that it is not licensed in affirmative context while it is licensed in negative context（see（1a）and（1b））. However, as the following examples show, *any* is not strictly a typical NPI. It can also appear in other environments such as questions and conditionals as seen in（1c）and（1d）.

(1)　a．*The teacher saw **any** student in the classroom.　　　　　（episodic）
　　　b．The teacher did not see **any** student in the classroom.　　　（negation）
　　　c．Did the teacher see **any** student in the classroom?　　　　（question）
　　　d．If he sees **any** student in the classroom, he usually talks to him.　　（conditional）

For this reason, the practice of more recent works is followed here and English *any* in cases like above will be referred to as an Affective Polarity Item（API）.

In contrast to English *any*, Japanese NPI *dare-mo* "anyone" as well as the NPI focus particle -*shika* "only" display the distribution of a strong NPI. They are only compatible with negation and result in ungrammaticality in questions or conditionals. The examples below illustrate the case of *dare-mo*.

(2)　a．*誰も来た。　　　　　　　　　　（Intended）"No one came."　　（episodic）
　　　　dare-mo ki-ta.
　　　　who-mo come-PAST[1]
　　　b．誰も来なかった。　　　　　　　　"No one came."　　　　　（negation）
　　　　dare-mo ko-naka-tta.
　　　　who-mo come-NEG-PAST
　　　c．*誰も来ましたか？　　　　　　（Intended）"Did anyone/nobody come?"
　　　　dare-mo ki-mashi-ta ka　　　　　　　　　　　　　　　　（question）
　　　　who-mo come-POLITE-PAST Q

    d．*誰も来たら、会議はキャンセルです。   （conditional）

    dare-mo ki-tara kaigi-wa kyanseru-desu

    who-mo come-if meeting-TOP cancel-COP

    （Intended）"If anyone/nobody comes, the meeting is cancelled."

As shown in（1）and（2）, English *any*（API）and Japanese *dare-mo*（strong NPI）clearly demonstrate distinct distributions.

　　Complicating the issue further, English *any* also functions as a Free Choice Item（FCI）, a distinct PSI that appears in imperatives, intensional context, and modal with a distinct reading（Dayal 1995, Kadmon and Landman 1993, Lee and Horn 1994, Giannakidou 2001）. This type of *any*（FCI *any*）has a universal-like（$\forall$）interpretation rather than an existential one for API *any*.

（3）　a．Press **any** button!   （imperative）

　　　b．Akira will eat **anything**.   （intensional）

　　　c．Any student can solve this problem.   （modal）

What is important to note here about FCIs is that the distribution of FCI *any* and that of API *any* are distinct although they are not mutually exclusive（Lee and Horn 1994）. For example, FCIs are claimed to be not quite acceptable with negation or questions while APIs are, as seen earlier in（1）（Giannakidou 1998, 2001）. Since English uses the homophonous *any* for both types, it can be tricky to tease them apart. However, these two items are often lexically distinct in other languages, thus the difference in their distributions can be demonstrated easily. Japanese FCI *nan-demo* "anything（FCI）" and *dare-demo* "anyone（FCI）" are used here to illustrate their distributional differences from APIs.

（4）　a．なんでも食べなさい。   "Eat anything."   （imperative）

　　　　Nan-demo tabe-nasai

　　　　What-demo eat-IMP

　　　b．彰はなんでも食べる。   "Akira will eat anything."   （intensional）

　　　　Akira-wa nan-demo taberu

　　　　Akira-TOP what-demo eat

　　　c．だれでもこの問題が解ける。   "Anyone can solve this problem."

　　　　dare-demo kono mondai-ga tok-eru   （modal）

　　　　who-demo this problem-NOM solve-can

　　　d．？？彰はなんでも読まなかった。   （negation）

　　　　Akira-wa nan-demo yoma-naka-tta

　　　　Akira-TOP what-demo read-NEG-PAST

　　　　（Intended）"？Akira didn't read just anything"

　　　e．？誰でも会議に参加したの？   （question）

　　　　dare-demo kaigi-ni sanka-shi-ta no

　　　　who-demo meeting-to participation-do-PAST Q

（Intended）"Did just anyone participate in the meeting?"

Even with English examples, it can be judged whether *any* with negation or in questions can have a universal-like FCI interpretation. Note here that the judgment here is not that of strong ungrammaticality （as seen in the cases of NPIs in （2））, but that of milder unacceptability or infelicity. Before reviewing the previous accounts for PSIs, I summarize the distribution of the data presented above in the table below.

Table 1. Distribution of Japanese NPIs, API *any* and FCIs

	Japanese NPIs -*shika*, *nani-mo*, *dare-mo*	API *any* （existential interpretation）	FCIs （universal interpretation）
Affirmative （episodic）	＊	＊	（allowed with subtrigging）[2]
Negation	○	○	??
Questions	＊	○	?
Conditional	＊	○	○
Imperative	＊	＊	○
Intensional	＊	＊	○
Modal （can）	＊	＊	○

　　There have been a number of analyses provided to account for the distribution of *any* （both API and FCI）. Many have long focused on identifying the contexts in which PSIs appear by assigning either syntactic or semantic conditions on the environment where PSIs can appear grammatically, e. g. Klima's （1964） [Affective] feature （and c-command variants thereof）, Ladusaw's （1979） Downward Entailment, Progovac's （1994） Binding, etc. For example, Klima （1964） characterizes the licensing condition for PSIs to be a feature called [Affective]. As long as PSIs are c-commanded by an item with this feature, they are licensed. Looking at the table above, it means that negation marker, question marker, and conditional marker will all have this feature, thus license *any*. While this approach may capture the distribution of PSIs, it tends to lack in the explanatory power addressing the question why certain PSIs are only licensed in the limited environments.

　　More recent studies examine the lexical content of PSIs and attempt to derive their limited distribution by finding the semantic or pragmatic incompatibility between the given environment and its semantic content （Kadmon and Landman 1993, Lee and Horn 1994, Krifka 1995, Lahiri 1998, Giannakidou 2001）. For example, *any* （and its equivalent in Hindi） is analyzed to be semantically composed of a scalar focus adverb *even* （EVEN） and an indefinite *a* （or ONE） （Lee and Horn 1994, Krifka 1995, Lahiri 1998）. The reason why *any* is not accepted in affirmative episodic sentence is because of the incompatibility of EVEN+ONE in such environment （cf. （1））.

（5）　a ．#The teacher saw **even one** student in the classroom.　　　　　　　　（episodic）

　　　b ．The teacher did not see **even a** student in the classroom.　　　　　　　（negation）

ｃ．Did the teacher see **even one** student in the classroom?   （question）

ｄ．If he sees **even one** student in the classroom, he usually talks to him.   （conditional）

The presupposition of EVEN and the minimum quantity ONE are pragmatically not compatible in （5a） because with the use of EVEN, one would expect a large number （of students） in positive context. In contrast, （5b）−（5d） are acceptable because there is no such pragmatic crash. Notice, however, that the judgment of （5a） remains as a pragmatic oddity at best and not that of a sharp ungrammaticality. This leaves the question whether the status of *any* in affirmative episodic context is that of a similar infelicity. Leaving this question aside, this approach is motivated by the fact that the combination of an indefinite and a scalar focus marker is often used to form a lexical item equivalent to *any* in other languages, e.g. Korean *amwu-to*, Hindi *ek bhii*, and Japanese *dare-mo*. Interestingly and unfortunately, this analysis cannot be directly extended to account for Japanese NPI *dare-mo* because it is not acceptable in questions or conditionals （see （2））.

For Japanese NPIs, the focus has mainly been on the former approach where it is claimed that Japanese NPIs need to be in a certain syntactic structure （e. g. mutual c-command） with the negation marker *-nai* （Oyakawa 1975, Muraki 1978, Kato 1994, Watanabe 2004）. This approach seems to capture the data well, accounting for the very limited distribution of Japanese NPIs, which are sharply ungrammatical in unlicensed environments. This type of syntactic analysis seems adequate for the strict NPIs, however, is this really adequate to capture all PSI phenomena in Japanese? The answer I would like to suggest is no. In the next section, a Japanese expression, which displays a peculiar polarity sensitivity, is introduced to pose a question to the previous approaches to PSIs.

３．**Japanese ONE + Scalar Particles**

As discussed earlier, the combination of EVEN and ONE often forms a polarity sensitive item in many languages. Literally, English phrase *even a single* also form a polarity sensitive item, and so do Japanese expressions such as *hito-tsu-mo* "even one" and *hito-ri-mo* "even one person". They are usually composed of a cardinal ONE and a classifier （counter）, followed by a focus *particle -mo* "also, even".[3]

（6）　ａ．*学生を一人も見た。　　　　　　　　　　　　　　　　　　（episodic）

gakusei-o hitori-mo mi-ta

student-ACC one. person-mo see-PAST

"#（I）saw **even a single** student."

ｂ．学生を一人も見なかった。　　　　　　　　　　　　　　　　（negation）

gakusei-o hitori-mo mi-naka-tta

student-ACC one. person-mo see-NEG-PAST

"（I）did not see **even a single** student."

ｃ．*学生を一人も見ましたか？　　　　　　　　　　　　　　　　（question）

gakusei-o hitori-mo mi-mashi-ta ka

student-ACC one. person-mo see-POLITE-PAST Q

"Did （you） see **even a single** student？"

ｄ．*学生を一人も見たら、帰るよう言ってください。　　　　　　（conditional）

        gakusei-o hitori-mo mi-tara, kaeruyou itte-kudasai

        student-ACC one. person-mo see-if, return say-IMP

        "If he sees **even a single** student, please tell him to go home."

The distributional pattern is exactly the same as the strong NPI *dare-mo* "anyone" for these expressions, differing significantly from the English equivalent *even a single*. For example, while *hitori-mo* results in a sharp ungrammaticality in questions as in (6c), the English version is acceptable with the reading known as 'negative bias' (Borkin 1971, Kay 1990, Wilkinson 1996).[4] This is a reading where the speaker, by the use of *even*, expects the answer to be negative in asking the question. In the case of (6c), the speaker expects that the hearer probably did not see any student.

    Here a question arises as to how we can form a grammatical version of (6c) in Japanese with the same interpretation (negative bias) as English. Instead of the particle *-mo*, another particle *-demo* is used to achieve this.

(7) a．学生を一人でも見ましたか？   "Did (you) see **even a single** student?"

        gakusei-o hitori-demo mi-mashi-ta ka

        student-ACC one. person-demo see-POLITE-PAST Q

      b．先生に一回でも話したの？   "Did (you) talk to the teacher **even once**?"

        sensei-ni ikkai-demo hanashi-ta no

        teacher-to once-demo talk-PAST Q

Notice that this particle *-demo* is also used in forming Free Choice items with indeterminate pronouns (wh-words) (see (4)). The combination of ONE expression and *-demo* in Japanese leads to an interesting set of data, differing significantly from the distribution of the strong NPIs observed earlier. Observe the following set of data which compares the distribution of ONE-*demo* and ONE-*mo* in various "polarity sensitive" context. The data without any particles (bare versions) are also provided to illustrate that they are not polarity sensitive without these particles.

(8) a．？？水を一滴でも飲んだ。   (Intended)"#(I) drank even a drop of water."

        mizu-o itteki-demo non-da   (affirmative; episodic)

        water-ACC one. drop-demo drink-PAST

      b．*水を一滴も飲んだ。

        mizu-o itteki-mo non-da

        water-ACC one. drop-mo drink-PAST

      c．水を一滴飲んだ。

        mizu-o itteki non-da

        water-ACC one. drop drink-PAST

        "(I) drank a drop of water."

(9) a．？？猫が一匹でもこなかった。   (Intended)"Not even a single cat came."

　　　　Neko-ga ippiki-demo ko-naka-tta　　　　　　　　　　　　　　　（negative）

　　　　cat-NOM one-demo come-NEG-PAST

　　ｂ．猫が一匹もこなかった。

　　　　Neko-ga ippiki-mo ko-naka-tta

　　　　cat-NOM one-mo come-NEG-PAST

　　ｃ．猫が一匹こなかった。

　　　　Neko-ga ippiki ko-naka-tta

　　　　cat-NOM one come-NEG-PAST

　　　　"One cat did not come."

⑽　ａ．先生に一回でも話したの？　　　　　　　　"Did（you）talk to the teacher even once?"

　　　　sensei-ni ikkai-demo hanashi-ta no　　　　　　　　　　　　　　（question）

　　　　teacher-to once-demo talk-PAST Q

　　ｂ．*先生に一回も話したの？

　　　　sensei-ni ikkai-mo hanashi-ta no

　　　　teacher-to once-mo talk-PAST Q

　　ｃ．先生に一回話したの？

　　　　sensei-ni ikkai hanashi-ta no

　　　　teacher-to once talk-PAST Q

　　　　"Did you talk to the teacher once?"

⑾　ａ．一ページでも書いたら、単位をあげる。　　　　　　　　　　　（conditional）

　　　　ichipeeji-demo kai-tara tani-o ageru

　　　　one. page-demo write-if credit-ACC give

　　　　"If（you）write even a single page,（I）will give you credits."

　　ｂ．*一ページも書いたら、単位をあげる。

　　　　ichipeeji-mo kai-tara tani-o ageru

　　　　one. page-mo write-if credit-ACC give

　　ｃ．一ページ書いたら、単位をあげる。

　　　　ichipeeji kai-tara tani-o ageru

　　　　one. page write-if credit-ACC give

　　　　"If（you）write one page,（I）will give you credits."

⑿　ａ．一口でも食べなさい。　　　　　　　　　　　　　　　　　（imperative）

　　　　hitokuchi-demo tabe-nasai

　　　　one. bite-demo eat-IMP

　　　　"Have even a single bite.（Have at least one bite）"

　　ｂ．*一口も食べなさい。

　　　　hitokuchi-mo tabe-nasai

　　　　one. bite-mo eat-IMP

    c．一口食べなさい。

       hitokuchi tabe-nasai

       one. bite eat-IMP

       "Have a bite."

⑬　a．一滴でも飲みたい。　　　　　　　　　　　　　　　　　　　　　（intensional）

       itteki-demo nomi-tai

       one. drop-demo drink-want

       "I want to drink even a single drop（of liquid）."

    b．*一滴も飲みたい。

       itteki-mo nomi-tai

       one. drop-mo drink-want

    d．一滴飲みたい。

       itteki nomi-tai

       one. drop drink-want

       "I want to drink a drop（of liquid）."

The distribution and judgment of ONE-*demo* is clearly different from those of ONE-*mo*（the strong NPIs）, thus any syntactic structural account（of a certain licenser and ONE-*demo*）would require a major modification to account for such differences. What is peculiar about ONE-*demo* is that its distribution is not exactly that of API *any* or that of FCIs, but it seems to be the combination of both. Recall the distribution of PSIs earlier from Table 1 and compare that with Table 2 below.

Table 2. Distribution of Japanese ONE-*demo*

	Japanese ONE-*demo*
Affirmative（episodic）	??
Negation	??
Questions	◯（negative bias reading = even one）
Conditional	◯（minimum condition）
Imperative	◯（"at least" reading）
Intensional	◯

While the distribution is freer than that of API *any*, the interpretation is very similar to how *any* is analyzed to be（even+one）. However, the questionable status of ONE-*demo* with negation is rather unexpected if we assume that -*demo* is interpreted similarly to *even* because the combination of EVEN+ONE is generally accepted with negation. This illustrates that the direct application of the EVEN+ONE analysis provided by Lee and Horn（1994）and Lahiri（1998）, which relies on the scalar presupposition of EVEN to be that of likelihood, seems inadequate. However, the idea that the incompatibility of the semantic content of the lexical item（e. g. its presupposition）and the given environment gives rise to the infelicity of the sentence is still appeal-

ing. For example, Giannakidou（2007）also finds a lexical item in Greek *esto* "even" which displays a simi-lar distribution to ONE-*demo*, and explains its distribution by its lexical content. She achieves this by enrich-ing the lexical semantics for the "EVEN" item, namely, by proposing different EVEN items would be sensi-tive to different types of scale besides likelihood scale.

Regardless of what kind of analyses would be suited for ONE-*demo*, it is obvious that there is no one sin-gle account examined so far that can explain the distributions of both the strong NPI type and the freer ONE*demo* type. The next section discusses the implication of the data for a theory of polarity items.

４．**Reflecting on Diversity of PSIs and their Judgments**

It is often the case that a theory of polarity items attempts to provide a single analysis for all types of PSIs, either because it does not recognize the diversity or because it is simply more economical thus appealing as a theory to extend and apply one analysis to all data. However, it is dangerous to have such a stance in analyz-ing PSIs because it would often overlook the complexity of PSI phenomenon. It is important to recognize the diversity in the types of PSIs that exist in natural languages both within and across languages and any theory of polarity should be able to address such diversity.

As we have seen above, Japanese, which is well known for its strong NPIs, also contains expressions that display more complex polarity sensitivity. With little data we have seen, it was already demonstrated how complex and different PSI phenomenon can be for each lexical item. On the one hand, a strong NPI type dem-onstrated a very strict distribution with sharp ungrammaticality when not licensed. It seems ideal for this type of case to be handled in syntax, ruling out the ungrammatical cases by syntactic condition. On the other hand, the judgment for ONE-*demo* was weaker, either infelicitous or pragmatically odd. This type of judgment is ideal for semantic-pragmatic analysis where the limited distribution is explained by some sort of presupposi-tional failure in the given context. It can be suggested that the presupposition of *-demo* is such that it becomes incompatible with the cardinal ONE in both affirmative and negative contexts while being compatible with other environments such as conditional, imperative, and questions. The main idea here is that each type of PSI is different, and that it may be sensitive to a different level of grammar（syntax, semantics, pragmatics）. The Japanese case illustrated that at least a certain PSI would be treated best in syntax（sharp judgments）, while others by its semantic content in a given pragmatic context.

While the emphasis of this paper has been to recognize the diversity, thus different treatment of polarity sensitivity, it does not mean that it is impossible to have a generalization for the distribution of polarity sensi-tive items. For example, Giannakidou（1998）characterizes the overall licensing environment of PSIs to be Nonveridicality, enriching Ladusaw's（1980）Downward Entailment. Her characterization of Nonveridical-ity and anti-veridicality also captures the Japanese data discussed here: strict NPIs are licensed only by anti-veridicality while the distribution of *-demo* can be explained as environments that are nonveridical. As con-firmed by the Japanese data as well as others（Nathan 1999）, this characterization of the licensing environ-ment seems to hold for all PSI types, making the generalization possible.

５．**Conclusions**

In this paper, Japanese ONE-*demo* was introduced as demonstrating peculiar polarity sensitivity that had not been observed before. Its distribution was clearly distinct from that of NPIs as well as other already estab-

lished PSI types such as APIs and FCIs. It became evident that Japanese PSI phenomena was more compli-
cated than initially supposed, thus requires further investigation to address the different types of PSIs, namely
the strong NPI types with sharp ungrammaticality and the freer PSI types with infelicity. It is suggested here
that the former type be accounted for by a syntactic account and the latter by a semantic and pragmatic ap-
proach, looking into the semantic content of the item（a recent approach taken for *any* as *even+a* but differ-
ent presupposition for *even*）.

　　One of the implications of this study is that any theory of polarity in general needs to pay close attention
to each lexical item and address the diversity of PSIs. It needs to allow a variety of approaches to be compat-
ible in analyzing different types of PSIs.

Acknowledgment

NOTES

1　For all the abbreviations in this paper, see Appendix A.
2　For more discussions on the subtrigging cases, please refer to Dayal（1995）.
3　Note here that the intonation of these Japanese expressions seems to influence their NPI status. In（6）, the judgment is given
　　if one were to pronounce these expressions with the NPI pitch. Fore more detailed explanation for the distinction between
　　regular pitch and NPI pitch, see Yoshimura（2007）.
4　Generally, a question with *even* is observed to result in ambiguity: low-likely reading and high-likely reading（＝negative
　　bias reading）. For more details, refer to Wilkinson（1996）, Herburger（2003）and references therein.

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Appendix A Abbreviations

The following is the list of abbreviations used in the glosses in this paper (alphabetical order).

ACC: accusative case
IMP: imperative
NEG: negation
NOM: nominative case
PAST: past tense
POLITE: polite marker
Q: question marker
TOP: topic marker