Varieties of positive polarity minimizers in Japanese

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Abstract:
This paper investigates the meaning of the Japanese positive polarity minimizers *sukoshi* and *chotto*, and considers (i) the source of variation in positive polarity minimizers, and (ii) their relationship with their negative polarity counterparts. I argue that although both *sukoshi* and *chotto* semantically denote a low degree or amount, each minimizer posits a different granularity level (cf. Sassoon 2012) at the level of conventional implicature (CI), i.e. they are mixed content (McCready 2010; Gutzmann 2011). *Sukoshi* conventionally implies that a given measurement is precise, whereas *chotto* conventionally implies that it is imprecise. I argue that this distinction can naturally explain: (i) the different sensitivities to types of measurement, (i.e. amount measurement, approximate measurement, and measurement with an emotive predicate), and (ii) why *chotto*, but not *sukoshi*, has a purely expressive use. Interestingly, the distinction between precise and imprecise modes of measurement is observed in negative polarity minimizers, but these do not have a purely expressive use. I will explain this in terms of dimensionality of meaning (Potts 2005). This paper shows that examining the not-at-issue components of minimizers is crucial to clarifying the source of variation in minimizers, as well as the relationship between positive and negative polarity items.

Keywords: minimizers, positive polarity items, precision, not-at-issue meaning, variation

1 Introduction

In natural language, there are two types of minimizers, namely a positive polarity minimizer and a negative polarity minimizer. Roughly speaking, minimizer negative polarity items (NPIs) are items that can appear naturally in a negative environment but cannot appear in a positive environment, as in (1). On the other hand, minimizer positive polarity items (PPIs) are items that can appear naturally in a positive environment but cannot appear in a negative environment, as in (2):

(1) Negative polarity minimizers
    a. *I didn't sleep a wink.*   (*I slept a wink*.)
    b. *He doesn't give a damn.*   (*John gives a damn*.)

(2) Positive polarity minimizers
    a. *The rod is slightly bent.* ('*The rod is not slightly bent*' is acceptable only with a metalinguistic reading.)
    b. *He is a little ill.* ('*He is not a little ill*' is acceptable only with a metalinguistic reading.)

Note that, as Bolinger (1972) and Horn (1989) observe, *slightly* and *a little* can appear in negative sentences that reflect metalinguistic negation. However, the important point is that they cannot be interpreted under normal negation.[1,2]

Since at least Fauconnier (1975), minimizer NPIs have received a great deal of attention in studies of polarity sensitivity. Minimizer NPIs have an emphatic meaning similar to the English *any*, and (in English) they can arise not only in negative environments but also in questions or conditional clauses. Researchers have extensively discussed the meaning of minimizer NPIs and the underlying semantic/pragmatic mechanisms behind the use of minimizer NPIs (e.g., Ladusaw 1980; Heim 1984; Lee and Horn 1994; Krifka 1995; Giannakidou 1998; Lahiri 1998; Guerzoni 2004; Chierchia 2013; Csipak, Eckardt, Liu, and Sailer 2013, among many others). However, in contrast to minimizer NPIs, minimizer PPIs have received little attention, except with regard to their relationship with metalinguistic negation (Bolinger 1972; Horn 1989). This may be because PPIs have generally been thought to have uninteresting properties (however, see, e.g., Szabolcsi 2004, and this special volume on PPIs).

In this paper, I investigate the meaning and use of the Japanese positive polarity minimizers *sukoshi* and *chotto*, and show that consideration of semantic variation in positive polarity minimizers provides important perspectives regarding the source of variation in minimizers and the relationship between PPIs and NPIs.

In Japanese, there are various kinds of expressions that denote a small amount/degree, such as *sukoshi* and *chotto*, as in (3):

(3) *Kono   hon-wa   {sukoshi/chotto}   takai.*
      this   book-TOP   a bit /a bit   expensive
      'This book is a bit expensive.'

In terms of polarity sensitivity, *sukoshi* and *chotto* behave as PPIs. Regarding a definition of PPIs, I define these as expressions that cannot appear within the immediate semantic scope of (non-metalinguistic) clausemate negation (see also Szabolcsi 2004; Giannakidou 2011). As the following example shows, a sentence with *sukoshi/chotto* is infelicitous if there is clausemate negation, as in (4):[3]

(4) ?? *Kono   pooru-wa   {chotto/sukoshi}   magat-tei-nai.*
      this   pole-TOP   a bit/a bit   bend-PERF-NEG
      'This pole is not *chotto/sukoshi* bent.'

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[1] Szabolcsi (2004) makes a similar observation for English *some*. For example, (i) is ill-formed unless *some* has scope over *not* or *not* is interpreted as emphatic denial.

(i) I don't see something.

Szabolcsi also connects the idea of emphatic denial to metalinguistic negation (Horn 1989).

[2] Note that unlike *a little*, *a bit* is not a PPI. *A bit* can be interpreted under a regular negation. For example, *I'm not a bit tired* means 'I'm not at all tired' (see Bolinger 1972; Horn 1989).

[3] Note that sentence (4) cannot be interpreted as metalinguistic negation. In order to get metalinguistic negation, the special form *to-iu wakedewanai* must be used, as in (i):

(i) *Kono pooru-wa   {chotto/sukoshi}   magat-teiru-(to-iu)   wakedewanai.*
   This pole-TOP   a bit /a bit   bend-TEIRU-that say   it is not the case
   'It is not the case that this pole is a bit bent.' (Meaning that this was its original shape.)

Note that although the degree/amount-indicating *sukoshi/chotto* cannot occur within the immediate scope of clausemate negation, it can have scope below external negation, as in (5):

(5)　　*Watashi-wa*　　[*Taro-ga*　　{*sukoshi/chotto*}　　*tukare-teiru*]-*kotoni*
　　　　I-TOP　　　　Taro-NOM　　a bit　/a bit　　　　tired-STATE-that
　　　　kizuka-naka-tta.
　　　　notice-NEG-PAST
　　　　'I didn't notice that Taro is a bit tired.' √ not > [$_{CP/IP}$ sukoshi$_{degree}$/chotto$_{degree}$]

This tendency is a general one among PPIs, and is a good sign that the degree and amount uses of *sukoshi* and *chotto* are PPIs.[4]

　　　　Although *sukoshi* and *chotto* (i) denote a small amount/degree, and (ii) have the properties of PPIs, their meanings and distribution patterns are not the same. In descriptive grammars and dictionaries, *chotto* is often mentioned as being more colloquial/casual than *sukoshi* (e.g., Kamiya 2002; *The handbook of Japanese adjectives and adverbs*). Intuitively, this is correct. However, *sukoshi* and *chotto* have asymmetrical distribution properties that cannot be explained by differences of style. For example, *sukoshi* can naturally be used for measuring quantity, but it is odd to use *chotto* in in such an environment, as illustrated in (6) and (7):

(6)　{*Sukoshi*/?*chotto*}-*no*　　*mizu*
　　　a bit　/a bit-GEN　　water
　　　'a bit of water'

(7)　{*Sukoshi*/?*chotto*}-*no*　　*okane*
　　　a bit　/ a bit-GEN　　money
　　　'a bit of money'

　　　　On the other hand, *chotto* can naturally be used in measuring the degree of emotion, as in (8), and to indicate an approximate measurement with a measure phrase ('MP and *a bit more*'), as in (9), or in a context in which a standard of measurement is not explicit (e.g., the context of shopping), as in (10), but it is odd to use *sukoshi* in these environments.

(8)　*Kono shigoto-wa*　　{*chotto* / ?*sukoshi*}　　*iyada.*
　　　this　job-TOP　　　a bit / a bit　　　unpleasant
　　　'This job is a bit unpleasant.'

(9)　*Kono sao-wa*　　{*30-do-chotto* / ??*30-do-sukoshi*}　　*magat-teiru.*
　　　this　rod-TOP　　30-degree-a bit / 30-degree-a bit　　bend-STATE
　　　'This rod is bent by 30 degrees and a bit more.'

(10) (The context of shopping)
　　　A: *Kono　jisyo　　ikura-desu-ka*?

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[4] There is a general tendency for PPIs to have scope below external negation (Ladusaw 1980; Szabolcsi 2004), as in (i):

(i) *I don't think that John called someone.*　　　√ not > [$_{CP/IP}$ some]

　　　　　　　　　　　　　　　　　　　　　　　(Szabolcsi 2004: 415)

      this   dictionary how much-PRED.POLITE-Q
      'How much is this dictionary?'
B: *Kochira-wa   3-man-yen-ni   nari-masu.*
      this-TOP   30000-yen-to   become-PRED.POLITE
      'This will be 30,000 yen.'
A: {*Chotto* / ?*sukoshi*}   *takai-naa.*
     a bit   / a bit   expensive-Prt
     'Oh, it is a bit expensive.'

Why is there an asymmetry between *sukoshi* and *chotto*? Where does this asymmetry originate?

In this paper, I claim that *sukoshi* and *chotto* have the same semantic meaning (i.e., 'the amount/degree is small'), but they posit different degrees of granularity at the level of conventional implicature (CI): *sukoshi* conventionally implies that the speaker is measuring degree based on a precise scale, whereas *chotto* conventionally implies that the speaker measures degree based on an imprecise (coarse) scale.

I then claim that the CI component of minimizers can explain their distribution patterns. I also suggest that the difference between *sukoshi* and *chotto* in terms of level of granularity can also explain why *chotto*, but not *sukoshi*, was able to develop a speech act modifying use, as in (11):

(11) {*Chotto* /*sukoshi}   *hasami   aru*?
     a bit / a bit   scissors   exist
     At-issue meaning: Do you have scissors?
     Not-at-issue meaning: I am weakening the degree of the force of my request.
                                 (Matsumoto 1985; Sawada 2010)

An interesting point is that the semantic distinction between *sukoshi* and *chotto* is observed in their NPI counterparts. In Japanese, if the focus particle *mo* is added to *sukoshi* and *chotto*, they become minimizer NPIs, as in (12).[5]

(12) {*Chitto-mo*/*sukoshi-mo*}   *keiki-ga*   *agara-nai.*
     a bit-even/a bit-even   economy-NOM   rise-NEG
     'The economy does not become even a bit better.'

Intuitively, the sentence with *sukoshi-mo* sounds more precise than that with *chitto-mo*. In terms of usage, *chitto-mo* sounds more emotional in that the speaker does not care about the precise situation of economy. I argue that the parallelism between minimizer PPIs and minimizer NPIs can naturally be accounted for if it is assumed that the precision component of *sukoshi* and *chotto* is a CI. However, I also argue that there is asymmetry between the two in that there cannot be a pure expressive use in a minimizer NPI. I explain this in terms of the properties of CIs and the dimensionality of meaning (Potts 2005).

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[5] Note that there is a phonological change from *chotto* to *chitto* when the particle *mo* is attached to it. Notice, however, that in a colloquial mode of speech, *chitto* (or *chito*) can be used in an adjective-modifying environment as well, as in(i).
(i) *Kono   hon-wa*   {*chotto*/*chitto*}   *takai.*
    this   book-TOP   a bit/a bit   expensive
    'This book is a bit expensive.'

The theoretical implication of this paper is that examining the not-at-issue components of minimizers is crucial in clarifying the source of cross-linguistic and language-internal variation in minimizers, as well as the relationship between positive polarity and negative polarity minimizers.

The structure of this paper is as follows: In section 2, I consider certain typical cases of imprecision phenomenon, i.e., the interpretation of number words and approximators. Section 3 discusses the (im)precise semantic characteristics of *sukoshi* and *chotto* and show that, unlike the imprecision phenomenon of number words and approximators, their (im)precise meanings relate to CIs. More specifically, I analyze them as comprising mixed content (McCready 2010; Gutzmann 2011), that is, they comprise both an at-issue scalar meaning and a CI meaning concerning granularity. I also compare Sassoon's analysis of *slightly* to the proposed analyses of *sukoshi/chotto* and discuss the differences. Section 4 sets out the distributional differences of minimizers mentioned in the Introduction (along with the results of an informal paper-pencil survey) and explains the asymmetry in terms of their CI meanings. Section 5 extends the analysis to the expressive use of *chotto* and shows that the precision-based account is consistent with the existence of the expressive *chotto*. Section 6 focuses on NPI counterparts and discusses the similarities and differences between minimizer NPIs and minimizer PPIs. Section 7 considers cross-linguistic/language internal variation of minimizer PPIs. Language internally, I compare *sukoshi/chotto* with *wazukani* 'slightly.' Cross-linguistically, I compare Japanese *sukoshi/chotto* with English and Greek minimizers. Section 8 presents a conclusion and mentioned the theoretical implications of the present study.

2 Imprecision in numbers and approximators

Before analyzing the meanings of the Japanese minimizers *sukoshi* and *chotto* based on the idea of granularity/(im)precision, let us consider some examples of (im)precision phenomena.

The notion of imprecision is often discussed in the interpretation of number words and quantifiers like *all*. Lasersohn (1999) claims that *10 o'clock* in (13a) and *all* in (13b) have perfectly precise definitions. However, in practice, the terms are not used precisely.

(13) a. *John arrived at 10 o'clock.*
       b. *All the townspeople are asleep.*
                             (Lasersohn 1999: 522)

In (13a), even if John arrived at 10:01, the proposition is 'close enough to the truth' (Lasersohn 1999). Lasersohn analyzes the imprecision of number words and quantifiers compositionally based on the notion of 'pragmatic halos' (H_C). A pragmatic halo is a function that takes an object and returns a set of objects around it that are close enough to the actual /input object, as reflected by (14):

(14) Pragmatic halos (H_C) (Lasersohn 1999)
     $H_C(\alpha)$ = a set of objects that differ from $[[\alpha]]^{M,C}$ only in ways that are pragmatically ignorable in C.

For example, the pragmatic halos of *10 o'clock* may be represented as in (15):

(15) H_C(10 o'clock) = a set of times, each of which differs from 10 o'clock only in ways that are pragmatically ignorable in C.

Krifka (2002, 2007) further extends the imprecise interpretation of number words and argues that there are multiple levels of imprecisions in the interpretation of number words. He claims that very often, the simplicity of expressions correlates with coarse-grainedness in scale. For example, (16a) can be interpreted in a less precise manner than (16b):

(16) a. *The distance from Amsterdam to Vienna is 1000 km.*
　　 b. *The distance from Amsterdam to Vienna is 965 km.*
                                                                 (Krifka 2002)

Building on Krifka's (2007) idea of the granularity intervals of a scale, Sauerland and Stateva (2007) propose a 'granularity function' that maps each point of a scale to an interval that contains it, as in (17):

(17) a. $gran_{fine}$ (5m) = [4.95m, ..., 5.00m, ..., 5.05m]
　　 b. $gran_{mid}$ (5m) = [4.75m, …, …, 5.00m, …, … , 5.25m]
　　 c. $gran_{coarse}$ (5m) = [4.50m, …, …, …, 5.00m, …, …, …, 5.50m]
                                            (Sauerland and Stateva 2007: 232)

Sauerland and Stateva (2007) then extend the analysis of number words to the semantics of scalar approximators like *approximately* and *exactly*. They claim that scalar approximators make reference to a point/endpoint of a scale and regulate the size of the granularity intervals. They propose that there are two types of scalar approximators, as in (18):

(18) Scalar approximators (Sauerland and Stateva 2007)
　　 a. Scalar more precise approximators: *exactly*, *absolutely*, *completely*, *precisely*, *perfectly*
　　 b. Scalar less precise approximators: *approximately*, *about*, *partially*, *sufficiently*, *roughly*

For example, Sauerland and Stateva (2007) propose the lexical entries in (19) for *approximately* and *exactly*:

(19) a. $[[exactly]]^{gran}(G) = G(\{finest(gran)\})$
　　 b. $[[approximately]]^{gran}(G) = G(\{coarsest(gran)\})$

Both set the granularity parameter for the evaluation of their complement to a singleton set, *exactly* to the finest and *approximately* to the coarsest granularity.

3 The phenomenon of (im)precision in *sukoshi* and *chotto*
3.1 The (im)precise meaning of Japanese minimizers is a CI

Let us now consider the meaning of *sukoshi* and *chotto*. Intuitively, *sukoshi/chotto* are different from scalar approximators. Unlike approximators, the main function of *sukoshi* and *chotto* is to measure a degree/amount of a target.

However, I will argue that *sukoshi* and *chotto* also involve a notion of granularity. While *sukoshi* signals that a given measurement is precise, *chotto* signals that a given measurement is imprecise. This intuition is supported by the fact that, while *sukoshi* can naturally co-occur with the adverb *genmitsu-ni iu-to* 'strictly speaking,' *chotto* cannot, as shown in (20):

(20)   (Context: A doctor is looking at the body fat percentage of a patient.)
      Genmitsu-ni iu-to   anata-wa   {sukoshi /??chotto} futot-teiru.
      strict-ADV   say-if you-TOP   a bit /a bit   fat-STATE
      'Strictly speaking, you are a bit fat.'

                                                    (Yusuke Kubota, personal communication)

      What, then, are the meanings of *sukoshi* and *chotto*? I propose that *sukoshi* and *chotto*
comprise mixed content in the sense of McCready (2010) and Gutzmann (2011). They have a
vague scalar meaning in the at-issue component (i.e., greater than a standard by a small
amount/degree) and (im)precision as a CI, as set out in (21).[6]

(21)   a. *Sukoshi* semantically denotes that the given degree is low, but in addition to its
         meaning, it conventionally implies that the speaker is positing a precise scale.
      b. *Chotto* semantically denotes that the given degree is low, but in addition to its
         meaning, it conventionally implies that the speaker is positing an imprecise scale.

      Under this analysis, the sentence in (22) is interpreted as having both at-issue and
CI meanings:

(22)   *Kono   sao-wa   {sukoshi/ chotto} magat-teiru.*
      this   rod-TOP   a bit / a bit   bend-STATE
      At-issue meaning: 'This rod is a bit bent.' (The degree of this rod's bent-ness is higher
      than the standard (zero) by a small degree.)
      CI of *sukoshi*: 'I am measuring the degree precisely.'
      CI of *chotto*: 'I am measuring the degree imprecisely.'

      Let us verify the idea that the (im)precision component is a CI. According to Potts
(2005), CIs are part of the conventional meaning of words, but are logically and
compositionally independent of 'what is said' (Grice 1975; Potts 2005). Potts (2005, 2007)
further claims that CIs are typically speaker-oriented.
      There are several pieces of evidence for the idea that unlike approximators, the
(imprecision) component of *sukoshi* and *chotto* are CIs ('not part of what is said'). First, the
(im)precise meaning triggered by *sukoshi/chotto* cannot be challenged by saying 'No, that is
false,' as shown in (23):[7]

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[6] The idea that minimizers regulate a granularity level is also found in Sassoon (2012).
  Sassoon also analyzes the meanings of the English modifier *slightly* based on the notion of
  granularity. However, my analysis is different from Sassoon's analysis in that I consider that
  Japanese minimizers are not pure granularity setters (see section 3.3).
[7] Note that the imprecision interpretation of a number cannot be denied by saying 'No, that is
false,' as in (i):
(i) A: *Taro-wa   kyoo 30-kiro   hashi-ta.*
       Taro-TOP   today 30-kilometer run-PAST
       'Today, Taro ran 30 kilometers.'
   B: *Iya sore-wa   uso-da.*
      no   that-TOP false-PRED
      'No, that is false.'
However, this does not mean that the imprecise meaning by the use of a number word is a CI.
It is not part of the meaning of the phrase *30 kiro*, but would be considered as a

(23) A: *Kono   sao-wa   {sukoshi / chotto}   magat-teiru.*
       this   rod-TOP   a bit / a bit   bend-STATE
       At-issue meaning: 'This rod is a bit bent.' (The degree of this rod's bent-ness is
       higher than the standard (zero) by a small degree.)
       CI of *sukoshi*: 'I am measuring the degree precisely.'
       CI of *chotto*: 'I am measuring the degree imprecisely.'

   B: *Iya   sore-wa   chigau-yo.*
      no   that-TOP   false-YO
      'No, that's false.'

This aspect is quite different in the case of approximators. As the examples in (24)
and (25) show, denial can target the (im)precise part of a sentence:

(24) A: *Kono   sao-no   nagasa-wa   choodo 1-meetoru   ari-masu.*
       this   rod-GEN length-TOP   exactly 1-meter   exist-PRED.POLITE
       'The length of this rod is exactly 1 meter.'
    B: *Iya, sore-wa   chigau-yo. 1-meetoru-2-senchi   ari-masu-yo.*
       no   that-TOP   false-YO   1-meter-2-cm   exist-PRED.POLITE-YO
       'No, that's false. It is 1 meter 2 centimeters long.'

(25) A: *Kono   sao-no   nagasa-wa   daitai   1-meetoru   ari-masu.*
       this   rod-TOP length-TOP   around   1-meter   exist-PRED.POLITE
       'The length of this rod is about 1 meter.'
    B: *Iya, sore-wa   chigau-yo. Choodo   1-meetoru-desu-yo.*
       no   that-TOP   false-YO   Exactly   1-meter-PRED.POLITE-YO
       'No, that's false. Its length is exactly 1 meter.'

Second, the (im)precise meaning triggered by *sukoshi/chotto* cannot be under the
scope of a logical operator, such as in a question or the antecedent of a conditional, as
illustrated in (26):

(26) a. Conditional
       Moshi   {chotto/sukoshi}   okureru-baai-wa   denwa-si-masu.
       if   a bit /a bit   late-in case-TOP   call-do-PRED.POLITE
       'In case I am a bit late, I will call you.'
       CI of *sukoshi*: 'I am measuring the degree precisely.'
       CI of *chotto*: 'I am measuring the degree imprecisely.'

    b. Question
       {Chotto/sukoshi}   okure-temo   ii-desu-ka?
       a bit /a bit   late-even if   OK-PRED.POLITE-Q
       'Can I be a bit late?'
       CI of *sukoshi*: 'I am measuring the degree precisely.'

conversational implicature (see also Krifka 2002).

CI of *chotto*: 'I am measuring the degree imprecisely.'

In contrast, in the case of approximators, their (im)precise meanings are under the scope of the conditional or question, as in (27):

(27) a. Conditional
   Kono   ita-no   nagasa-ga   {choodo/daitai}   1-meetoru-naraba
   this   board-GEN   length-NOM   exactly/approximately 1-meter-COND
   kai-masu.
   buy-PRED.POLITe
   'If the length of this board is exactly/approximately 1 meter, I will buy it.'

   b. Question
   Kono   doa-no   haba-wa   {choodo/daitai}   1-meetoru-desu-ka?
   this   door-GEN   width-TOP   exactly/approximately 1-meter-PRED.POLITE-Q
   'Is the width of this door exactly/approximately 1 meter?'

One may now wonder whether the (im)precise meaning is actually a presupposition, rather than a CI. Similar to CIs, presuppositions also project, even if embedded under a logical operator. Generally, presuppositions are considered to be a proposition whose truth is taken for granted in the utterance of a sentence. I consider that the (im)precise meaning is not a presupposition. Although the scale is a basis for measuring degrees, specific information on granularity (whether or not it is precise) is not shared prior to the utterance. Its information structure is new information. As in the case of appositives (Anderbois et al. 2013), the CI component of *sukoshi/chotto* directly and silently imposes their content on the common ground.

Further supporting evidence for the idea that the (im)precise meaning is a CI comes from the fact that, unlike a presupposition, its meaning can project beyond the complement of an attitude predicate ('presupposition plugs'). It is standardly assumed that an attitude predicate blocks a presupposition projection. For example, in (28), the possessive marker *no* creates the 'presupposition' that 'Hanako has a book,' but it does not project to the matrix clause because it is embedded under the presupposition plug *sinzi-teiru*:

(28) *Sensei-wa   kore-wa   Hanako-no   hon-da-to   omo-tteiru.*
    teacher-TOP   this-TOP   Hanako-GEN   book-PRED-COMP   think-TEIRU
    'My teacher believes that this is Hanako's book.'

However, in the case of minimizers, their (im)precise meanings can be anchored to the speaker in the same embedding environment, as in (29).[8]

(29) *Taro-wa   kono   hon-wa   {sukoshi / chotto} takai-to*
    Taro-TOP   this   book-TOP   a bit / a bit   expensive-that
    omo-tteiru-nichigainai.
    think-PROG-must
    'Taro must be thinking that this book is a bit expensive.'
    CI meaning of *chotto*: The speaker's manner of measurement is imprecise.
    CI meaning of *sukoshi*: The speaker's manner of measurement is precise.

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[8] Note that there is also a subject-oriented reading.

3.2 Formal analysis of *sukoshi* and *chotto*

Let us now analyze the meanings of *sukoshi* and *chotto* in a formal manner. Building on the idea of mixed content (McCready 2010; Gutzmann 2011), I propose that *sukoshi* and *chotto* have the meanings set out in (30) and (31), in which the at-issue component is to the left of ♦ and the CI component to the right (McCready 2010; Gutzmann 2011):

(30) [[sukoshi]]: $<<d^a, <e^a,t^a>>, <e^a,t^a>> \times t^s$
$= \lambda G \lambda x \exists d[d>_\approx STAND_G \wedge G(d)(x)]$ ♦ $\exists d_1[d_1 >STAND_{precise} \wedge precise(scale_G) = d_1$

(31) [[chotto]]: $<<d^a, <e^a,t^a>>, <e^a,t^a>> \times t^s$
$= \lambda G \lambda x \exists d[d>_\approx STAND_G \wedge G(d)(x)]$ ♦ $\exists d_1[d_1 <STAND_{precise} \wedge precise(scale_G) = d_1$

In prose, in the at-issue domain, *sukoshi* and *chotto* both semantically denote that there is some degree d such that d is slightly greater than a standard ($>_\approx STAND$ stands for 'greater than a standard by a small degree'), and each has a different CI component. In the CI domain, *sukoshi* conventionally implies that there is some degree d such that the degree of precision of a given scale G is greater than a standard (i.e., the scale is precise). In contrast, in the case of *chotto*, it conventionally implies that the degree of precision of a given scale is less than a contextual standard (i.e., the scale is not precise). G in the CI component is anaphoric to the G in the at-issue domain. (See Sudo (2012) for an anaphoric approach to the relationship between at-issue and presupposition.)

Compositionally, the minimizer combines with a gradable predicate via mixed application (McCready 2010, Gutzmann 2011), as shown in (32):

(32) Mixed application (based on McCready 2010)

$$\alpha(\gamma): \tau^a$$
$$\bullet$$
$$\beta: \upsilon^s$$

$$\alpha \blacklozenge \beta: <\sigma^a, \tau^a> \times \upsilon^s \qquad\qquad \gamma: \sigma^a$$
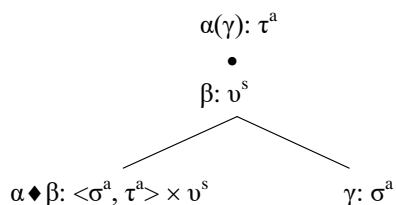
The superscript *a* stands for an at-issue type and the superscript *s* stands for a shunting type (a special type of CI). The bullet ● is a metalogical device for separating independent lambda expressions. Note that α and β form a single lexical item (mixed content). The crucial point is that the rule in (32) is resource sensitive. The argument of the mixed content is not passed up to the level above the bullet ●. This point is quite different from Potts's (2005) CI application. In Potts's (2005) CI application, the at-issue argument of the CI-inducing element is passed up to the level above the bullet—in other words, the application is resource-insensitive. (See McCready (2010) for a detailed discussion on the difference between a resource-sensitive CI application (shunting application) and Potts's (2005) resource-insensitive CI application, which utilizes a different CI type, namely type *c*.)

Let us now consider how *sukoshi* and *chotto* are computed based on the example in (33).

(33) *Kono   sao-wa   {sukoshi/chotto}   magat-teiru.*
     this   rod-TOP   a bit/a bit   bend-STATE

At-issue meaning: 'The degree of this rod's bent-ness is higher than the standard (zero) by a small degree.'
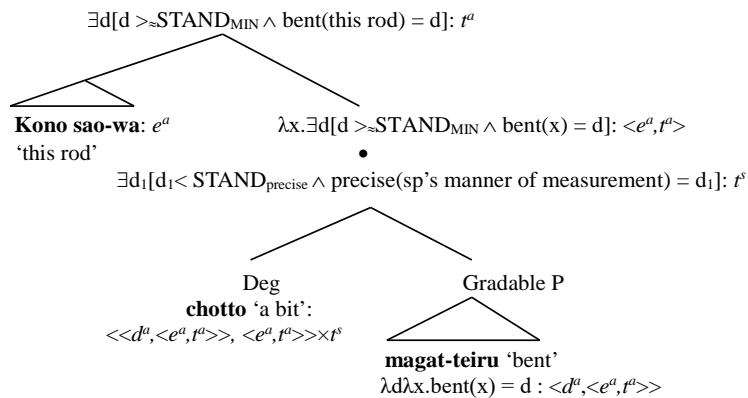CI of *sukoshi*: The speaker's measurement is precise.
CI of *chotto*: The speaker's measurement is imprecise.

As for the meaning of gradable predicates, I assume that they represent relations between individuals and degrees (Seuren 1973; Cresswell 1976; von Stechow 1984; Klein 1991; Kennedy 2007), as in (34).

(34)　a. $[[nagai]] = \lambda d\lambda x. \, long(x) = d$
　　　b. $[[magat\text{-}teiru]] = \lambda d\lambda x. \, bent(x) = d$

If the above rule is applied to (33) with *chotto*, the logical structure in (35) results.

(35)

$\exists d[d >_{\approx} STAND_{MIN} \wedge bent(this\ rod) = d]: t^a$

Kono sao-wa: e^a　　　　$\lambda x.\exists d[d >_{\approx} STAND_{MIN} \wedge bent(x) = d]: <e^a,t^a>$
'this rod'　　　　　　　　　　　•
　　　　　　$\exists d_1[d_1 < STAND_{precise} \wedge precise(sp's\ manner\ of\ measurement) = d_1]: t^s$

Deg　　　　　　Gradable P
chotto 'a bit':
$<<d^a,<e^a,t^a>>, <e^a,t^a>>\times t^s$

magat-teiru 'bent'
$\lambda d\lambda x.bent(x) = d : <d^a,<e^a,t^a>>$

The shunting operation prevents the at-issue argument of the minimizer from being consumed twice.

What, then, about the case of the noun-modifying use of the minimizer?

(36)　*Sukoshi-no　　mizu*
　　　a bit-GEN　　water
　　　'a bit of water'

Recall that it is odd to use *chotto*. I propose that the noun-modifying *sukoshi* has exactly the same meaning as the adjective-modifying *sukoshi*, both semantically and pragmatically, and both uses can be analyzed in a unified manner. I argue that in (36), *sukoshi* is modifying an invisible predicate AMOUNT.

Kayne (2005: 159) proposes that the English minimizer *a little* in (37a) is an adjective that modifies an unpronounced AMOUNT, as in (37b):[9]

(37)　a. *John has a little money.*

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[9] Kayne (2005: 161) further proposes that there is an unpronounced element AMOUNT even in the case of [*a little* + adjective], as in (i):

(i) a little AMOUNT unhappy

However, at least semantically, I do not think it is necessary to posit an invisible predicate in the case of [*a little* + Adjective]. The scale (dimension) is provided by the predicate *unhappy*.
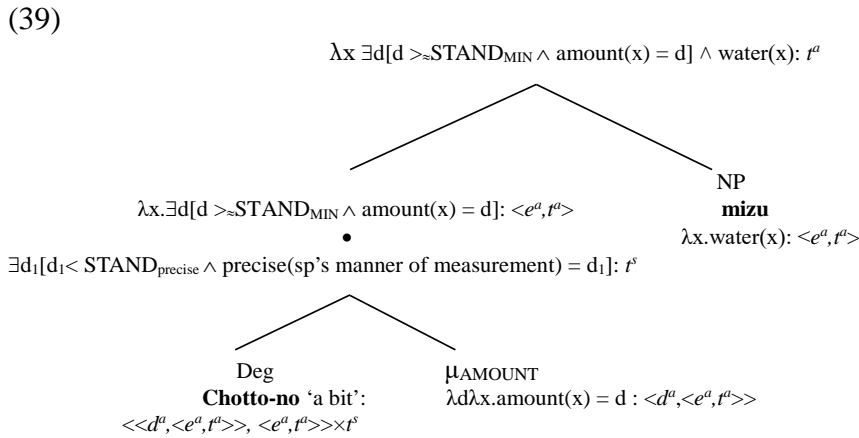
b. *John has a little* AMOUNT *money.*

Schwarzschild (2006) argues for a similar morpheme from both syntactic and semantic perspectives. He proposes that there is a functional head Mon^0 that links a measure phrase/QP and a noun. (A measure phrase/QP is in the specifier of Mon^0 and a noun is its complement.) He also claims that this functional head introduces a certain dimension that projects portions of the substance onto a scale.

Under this approach, (36) has a similar logical structure as (38).[10]

(38) *Sukoshi-no   ryoo-no   mizu*
       a bit-GEN   amount-GEN   water
       'a small amount of water'

The figure in (39) shows the logical structure of (36).

(39)

$$\lambda x\ \exists d[d >_{\approx} STAND_{MIN} \wedge amount(x) = d] \wedge water(x): t^a$$

$\lambda x.\exists d[d >_{\approx} STAND_{MIN} \wedge amount(x) = d]: <e^a,t^a>$

•

NP
mizu
$\lambda x.water(x): <e^a,t^a>$

$\exists d_1[d_1< STAND_{precise} \wedge precise(\text{sp's manner of measurement}) = d_1]: t^s$

Deg
Chotto-no 'a bit':
$<<d^a,<e^a,t^a>>, <e^a,t^a>>\times t^s$

μ_{AMOUNT}
$\lambda d\lambda x.amount(x) = d : <d^a,<e^a,t^a>>$

I assume the denotation of μ_{AMOUNT} as in (40):

(40) $[[\mu_{AMOUNT}]] = \lambda d\lambda x.amount(x) = d$

The measure function μ_{AMOUNT} in (40) associates individuals and degrees based on an amount scale. The advantage of this approach is that the meaning of the amount minimizer can be analyzed in exactly the same manner as that of the degree minimizer, without positing a new lexical entry. Note that μ_{AMOUNT} behaves like a lower closed scale adjective (absolute gradable predicate) in that it inherently posits a minimum endpoint. Thus, when μ_{AMOUNT} is combined with *sukoshi*, the standard of *sukoshi* is interpreted as a minimum standard, as in (41) and (42):

(41) $[[sukoshi]] = \lambda G_{<d^a,<e^a,t^a>>}\lambda x.\exists d[d >_{\approx}STAND \wedge G(d)(X)]$
(42) $[[sukoshi]] [[\mu_{AMOUNT}]]$
       $= \lambda x.\exists d[d >_{\approx}STAND_{MIN} \wedge amount(x) = d]$

(42) is then combined with *mizu* 'water' (= 43) via predicate modification (Heim and Kratzer 1998):

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[10] Here, I consider the genitive marker *no* not to have a meaning. It is a purely syntactic requirement to have this linker.

(43)　[[mizu]] = λx.water(x)

(44)　[[sukoshi-no (μ$_{AMOUNT}$)]] ∧ [[mizu]]
　　　　　　= λx.∃d[d >$_{≈}$STAND$_{MIN}$ ∧ amount(x) = d] ∧ water(x)

This kind of analysis allows us to analyze the meanings of the amount minimizer and degree minimizer in a unified manner. The question is then why only *sukoshi* can be used in the amount measurement environment. I will return to this question in section 4.

3.3 Comparison with Sassoon (2012)'s analysis of *slightly*

Before concluding this section, let us briefly compare my analyses of Japanese minimizers to Sassoon's analysis of the English *slightly*. As mentioned above, Sassoon (2012) and Sassoon and Zevakhina 2012) also assume that minimizers involve granularity/precision. However, Sassoon's analysis of *slightly* is quite different from my analyses of *sukoshi/chotto*.

　　　Sassoon considers adjectives G to be interpreted relative to a coarse granularity level g. Thus, *slightly* + G is interpreted relative to a fine granularity level g$_p$. In this analysis, the meaning of a gradable adjective and that of a modified gradable adjective are equivalent, except for their levels of granularity, as set out in (45):

(45)　a. [[G]]$_g$ = λx∈C: g(x) > d$_s$
　　　　b. [[slightly G]]$_g$ = λx∈C: g$_p$(x) > d$_s$, for g$_p$ is finer than g
　　　　　　　　　　　　　(Based on Sassoon 2012; Sassoon and Zevakhina 2012)

　　　Although Sassoon's analysis can naturally capture the meaning of *slightly*, it appears not to extend naturally to Japanese minimizers.

　　　First, *chotto* and *sukoshi* can not only modify a gradable predicate, but can also combine with nouns, measure phrases, etc. Such data clearly show that *sukoshi* and *chotto* have semantic content. It is not clear how Sassoon's approach could explain this fact in a uniform manner. My mixed content approach, on the other hand, can naturally explain that *sukoshi* has an at-issue (semantic) meaning in any environment, and is not merely a granularity setter.

　　　Second, Sassoon's semantic mechanism does not appear naturally to analyze the granularity level of *chotto*. *Chotto* signals that the given measurement is imprecise, but and it is not clear which is more precise between a simple adjective G and a modified form '*chotto* (G).' My approach, however, does not lead to this problem, as the granularity level of *chotto* is not calculated by comparing it with that of a bare gradable predicate.

　　　Due to these reasons, although I agree with Sassoon's (2012) idea that minimizers involve granularity, I propose that, at least in Japanese, *sukoshi* and *chotto* have semantic content and their granularity level is set independently.

4 Explaining the distribution patterns of *sukoshi* and *chotto* based on the notion of granularity

In the previous section I argued that *sukoshi* and *chotto* are of mixed content in that they bear the semantic meaning of 'low' but convey different information in terms of granularity in the CI component. In this section, I will show that the difference in granularity level is reflected in their distribution patterns, as set out in (46):

(46)　a. *Sukoshi* (but not *chotto*) can naturally be used for the measurement of quantity.

b. *Chotto* (but not *sukoshi*) can naturally be used in measuring the degree of emotion.
c. *Chotto* (but not *sukoshi*) can be used for approximate measurement with a measure phrase (MP and *a bit more)*.
d. *Chotto* (but not *sukoshi*) can be used in a context where a norm-related measurement is salient.

I will show that the above distributional differences are salient for many native speakers, and indeed statistically significant. I will then argue that the asymmetry can naturally be explained based on a difference of granularity level.

To help better understand the distributional difference between *chotto* and *sukoshi*, I presented an informal paper-and-pencil questionnaire to 35 native Japanese speakers on December 2014. All the participants were undergraduate students at Mie University. I asked them to rate the naturalness of 18 minimum pairs of sentences (36 sentences in total) based on a scale where [*] = completely odd, [??] = quite odd, [?] = a bit odd, and [OK] = completely natural. Each pair consisted of a sentence with *sukoshi* and a sentence with *chotto*. During the survey, the informants were allowed to go back and check the previous sentences if desired.

In the questionnaire, I first asked about the naturalness of the *sukoshi/chotto* sentences with a measurable predicate. Measurable predicates are predicates whose degrees can be measured by a measure phrase (e.g. five miles long). I composed these sentences as a practice test. I then asked the native speakers to judge the examples regarding (46), i.e. the examples with emotive predicates, the examples of measurement of quantity, and the examples of approximate measurement with a measure phrase. In these examples no contextual information was provided. Finally, I checked the naturalness of *sukoshi/chotto* in the context of shopping where a norm-related measurement was salient.

In analyzing the results of the questionnaire, I excluded the data from 2 informants who assigned "quite odd" to the example of *sukoshi/chotto* that had a measurable gradable predicate. I also excluded the data from one informant who failed to give consistent answers. Thus the total number of informants was reduced to 32.

4.1 Examples with no asymmetry (minimizers plus a measurable adjectives)
Let us first look at the case of minimizers where they combine with a measurable gradable predicate, such as (47) and (48):

(47) *This hon-wa   {chotto / sukoshi}   takai.*
     this book-TOP   a bit /   a bit   expensive
     'This book is a bit expensive.'
(48) *Kono sen-wa   {chotto / sukoshi}   magat-teiru.*
     this   line-TOP   a bit   / a bit   bend-TEIRU
     'This line is a bit curved.'

As the data in Table 1 show, most of the 32 respondents considered these sentences to be completely natural, and there was no significant difference between *sukoshi* and *chotto* in terms of naturalness:

Table 1: Native speakers' judgments of (47) and (48)

	Completely odd	Quite odd	A bit odd	Completely natural
Chotto takai 'a bit expensive'			5 15.6%	27 84.4%

			5	27
Sukoshi takai			5	27
			15.6%	84.4%
Chotto magat-teiru 'a bit curved'			7	25
			21.9%	78.1%
Sukoshi magat-teiru			3	29
			9.4%	90.6%

A paired t-test revealed that there was no significant difference between *sukoshi* and *chotto* in these examples ($p = 1.000$ in (47); $p = .211$ in (48) ($p > .05$)).[11]

4.2 Compatibility with an emotional (non-measurable) predicate

Let us now consider the first asymmetry regarding the compatibility of *chotto/sukoshi* with an emotional predicate, as in (49):

(49) *Kono shigoto-wa   {chotto / ?sukoshi}   iyada.*
      this   job-TOP   a bit   / a bit   unpleasant
      'This job is a bit unpleasant.'

As the data in Table 2 show, many native speakers considered there to be a difference between *sukoshi* and *chotto* in terms of naturalness in (49):

Table 2: Native speakers' judgments of (49)

	Completely odd	Quite odd	A bit odd	Completely natural
Chotto iyada 'a bit unpleasant'		4	3	25
		12.5%	9.4%	78.1%
Sukoshi iyada		6	14	12
		18.8%	43.8%	37.5%

A paired t-test revealed that the difference between *sukoshi* and *chotto* in terms of acceptability was significant ($p = .025$ in (49)). This result makes sense considering the granularity of *sukoshi/chotto*. It is not natural to use *sukoshi* with an gradable emotion predicate, as degrees of emotion cannot be measured in a precise manner.

I also asked respondents to judge the sentence in (50) with the predicate *baka-da* 'stupid,' which is also highly emotional. However, in this case the distinction was more subtle (see Table 3).

(50) *Taro-wa   {chotto/sukoshi} baka-da.*
      Taro-TOP   a bit/a bit   stupid-PRED
      'Taro is a bit stupid.'

Table 3: Native speakers' judgments of (50)

	Completely odd	Quite odd	A bit odd	Completely natural

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[11] In the questionnaire, I also presented a sentence with the measurable adjective *nagai* 'long':

(i) *Kono ita-wa   {chotto/sukoshi} nagai.*
    this   board-TOP   a bit/a bit   long
    'This board is a bit long.'

Statistically there was no significant difference between *sukoshi* and *chotto* in the example ($p = .096$ ($p > .05$).

		Completely odd	Quite odd	A bit odd	Completely natural
Chotto baka-da 'a bit stupid'			1 3.1%	10 31.3%	21 65.6%
Sukoshi baka-da			2 6.3%	15 46.9%	15 46.9%

A paired t-test revealed no significant difference between *sukoshi* and *chotto* ($p = .109$; $p > .05$). Although there was no statistically significant difference, it is at least possible to consider that there may be a difference between *sukoshi* and *chotto*, in comparison to the base line cases. Although various factors appear to be involved in the judgment of (50), it seems that there is a tendency for *chotto* to be regarded as more suitable than *sukoshi* in measuring the degree of stupidity.[12]

4.3 Measurement of quantity

Next, let us look at the asymmetry in the environment of quantity measurement, as reflected by (51) and (52):

(51) {*Sukoshi* / ?*chotto*}-*no*   *mizu*
    a bit   / a bit-GEN   water
    'a bit of water'

(52) {*Sukoshi* / ?*chotto*}-*no*   *okane*
    a bit   / a bit-GEN   money
    'a bit of money'

As the data in Table 4 show, more than half of the respondents indicated that the sentence with *chotto* was a bit odd (or worse):

Table 4: Native speakers' judgments of (51) and (52)

	Completely odd	Quite odd	A bit odd	Completely natural
Sukoshi-no muzu 'a bit of water'		1 3.1%	1 3.1%	30 93.8%

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[12] In the questionnaire, I also gave the example of *tukare-teiru* 'tired', which is non-measurable but not emotive:

(i) *Taro-wa*   {*chotto/sukoshi*}   *tukare-teiru-yooda*.
  Taro-TOP   a bit/a bit   tire-TEIRU-look
  'Taro seems to be a bit tired.'

Interestingly, native speakers judge that the sentence with *sukoshi* is more natural than the sentence with *chotto*.
(ii) Native speakers' judgement of (i)

	Completely odd	Quite odd	A bit odd	Completely natural
Chotto tukare-teiru-yooda 'a bit tire-TEIRU-looks'			11 (34.4%)	21 (65.6%)
Sukoshi tukare-teiru-yooda 'a bit tire-TEIRU-looks			1 (3.1%)	31 (96.9%)

This is presumably due to the fact that there is an evidential modal in the main clause. Since the speaker is measuring the degree of tiredness based on some evidence, it seems natural to consider that for many native speakers, using a precise mode of measurement is more appropriate and natural.

Chotto-no mizu	1 3.1%	4 12.5%	12 37.5%	15 46.9%
Sukoshi-no okane 'a bit of money'			4 12.5%	28 87.5%
Chotto-no okane	2 6.3%	5 15.6%	10 31.3%	15 46.9%

A paired t-test showed that the difference between *sukoshi* and *chotto* was significant (p < .001) for (51); p < .001) for (52)).

Why is it that more than half the respondents considered the sentence with *chotto* to be a bit odd (or worse)? I propose that it is odd to use *chotto* in the environment of quantity measurement because water and money nouns are measurable in a precise manner. Thus, *sukoshi* may be regarded as more suitable than *chotto*. Note that this is a purely pragmatic tendency and the difference is not categorical. There are speakers who consider the sentence with *chotto* to be completely natural.[13]

Interestingly, the above asymmetry is also found in the case of floating quantifiers, as in (53) and (54):

(53) *Mizu-o*　　　{*sukoshi* / ?*chotto*}　*nabe-ni*　*kuwae-ta.*
　　　water-ACC　　a bit / a bit　　　pan-LOC　add-PAST
　　　'I added a bit of water to the pan.'

(54) *Okane-o*　　　{*sukoshi* / ?*chotto*}　*kari-ta.*
　　　money-ACC　　a bit　 / a bit　　　lend-PAST
　　　'I borrowed a bit of money.'

Sukoshi and *chotto* do not combine directly with a noun, but semantically they measure the quantity (see Table 5).

Table 5: Native speakers' judgments of (53) and (54)

	Completely odd	Quite odd	A bit odd	Completely natural
Mizu-o　sukoshi 'a bit of water'			2 6.2%	30 93.8%
Mizu-o　chotto	1 3.1%	4 12.5%	9 28.1%	18 56.2%
Okane-o　sukoshi 'a bit of money'				32 100%
Okane-o　chotto	1 3.1%	4 12.5%	4 12.5%	21 65.6%

Similar to the case of floating quantifiers, a paired t-test revealed a significant difference

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[13] In the questionnaire, I also checked the noun modifying examples which involve *jikan* 'time' and *satou* 'sugar'. These examples also revealed that there is a significant difference between *sukoshi* and *chotto* (p = .005 for (i) and p < .001 for (ii)):

(i)　{*Sukoshi*/?*chotto*}-*no*　*jikan*
　　　a bit/a bit-GEN　　　　time
　　　'A bit of time'

(ii) {*Sukoshi*/?*chotto*}-*no*　*satou*
　　　a bit/a bit-GEN　　　　sugar
　　　'A bit of sugar'

between *sukoshi* and *chotto* (p = .001 for (53); p = .002 for (54)). This seems to further support the idea that the asymmetry originates with meaning. *Sukoshi* is more suitable because the amounts of water and money can be measured in a precise manner.[14]

4.4 Compatibility with a measure phrase ('MP plus *a bit more*')
Next, let us consider the case of minimizers that co-occur with a measure phrase. If a minimizer co-occurs with a measure phrase, an asymmetrical relationship between *sukoshi* and *chotto* arises (Sawada 2013), as shown in (55) and (56):

(55) *Kono   sao-wa   [30-do   -chotto / ??-sukoshi]   magat-teiru.*
      this   rod-TOP   30-degree   a bit /   a bit   bend-STATE
      'This rod is bent by a bit more than 30 degrees.'

(56) *Kono   ita-wa   [10-senchi   -chotto/ ??-sukoshi]   nagai.*
      this   board-TOP   10-centimeter   a bit /   a bit   long
      'This board is longer (than a contextual standard) by a bit more than 10 cm.'

As the data in Table 6 show, the respondents considered this contrast particularly salient.

Table 6: Native speakers' judgments of (55) and (56)

	Completely odd	Quite odd	A bit odd	Completely natural
30-do chotto '30 degrees + a bit more'		2 6.3%	8 25%	22 68.8%
30-do sukoshi	13 40.6%	7 21.9%	7 21.9%	5 15.6%
10-senchi chotto '10 cm + a bit more'		4 12.5%	5 15.6%	23 71.9%
10-senchi sukoshi	12 37.5%	13 40.6%	6 18.8%	1 3.1%

A paired t-test showed that there was a significant difference between *sukoshi* and *chotto* (p <.001) for (55); p <.001) for (56)).
      Why is it that a sentence becomes odd if an MP is (directly) combined with *sukoshi*? In this environment, the minimizer is adding additional information imprecisely. Compared to numbers, the information of the minimizer is imprecise and vague. This results in the inconsistency of *sukoshi*'s CI meaning and its function in [MP-*sukoshi*]. See Sawada (2013)

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[14] In the questionnaire I also checked the examples of floating quantifiers that semantically modify *jikan* 'time' and *satou* 'sugar.' There was a significant difference between *sukoshi* and *chotto* in terms of acceptability (p = .001 for (i); p = .008 for (ii)):

(i)   *Kore-o   tukuru-noni   jikan-ga   {sukoshi/?chotto}   kaka-tta.*
      this-ACC   make-in order to   time-NOM   a bit/a bit   cost-PAST
      'It took a bit of time to make this.'
(ii) *Koohii-ni   satou-o   {sukoshi/?chotto}   ire-ta.*
      coffee-LOC   sugar-ACC   a bit/ a bit   put-PAST
      'I put a bit of sugar in my coffee.'

for an explanation based on Gricean reasoning.[15] On the other hand, *chotto* can naturally combine with an MP because its imprecise CI naturally functions as a hedge (e.g., Lakoff 1972).

4.5 Contexts in which a standard measurement is not explicit
Finally, let us consider the asymmetrical case that is relevant to context. As the dialogue in (57) shows, in the context of shopping, it is more natural to use *chotto* than *sukoshi*:

(57)　A:　*Kono　jisyo　ikura-desu-ka*?
　　　　　this　dictionary　how much-PRED.POLITE-Q
　　　　　'How much is this dictionary?'
　　　B:　*Kochira-wa　3-man-yen-ni　nari-masu.*
　　　　　this-TOP　30000-yen-to　become-PRED.POLITE
　　　　　'This will be 30,000 yen.'
　　　A:　{*Chotto* /?*sukoshi*}　*takai-naa.*
　　　　　 a bit　/ a bit　　　expensive-Prt
　　　　　 'Oh, it is a bit expensive.'

As the data in Table 7 show, only 20 of the 32 respondents regarded the sentence with *sukoshi* as perfectly natural.

Table 7: Native speakers' judgments of (57)

	Completely odd	Quite odd	A bit odd	Completely natural
Chotto takai-naa 'a bit expensive'			1 3.1%	31 96.9%
Sukoshi takainaa		3 9.4%	9 28.1%	20 62.5%

A paired t-test showed that there was a significant difference between *sukoshi* and *chotto* (p = .001). I propose that here, too, the granularity-based account is possible. It is more natural to use *chotto*, because in the context of shopping, one does not usually evaluate a price based on a precise scale, simply referring to a norm as a standard of comparison. *Chotto* is suitable for further negotiation.[16]

5 Extension to the expressive *chotto*
I have thus far focused on the kind of minimizers that measure a degree or quantity of an

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[15] Notice that the asymmetry between MP-*sukoshi* and MO-*chotto* evaporates if the conjunction *and* is inserted, as in (i):

(i) *30-do-to　　{chotto/sukoshi}*
　　30-degree-and　a bit/　a bit
　　'30 degrees and a bit more'

S*ukoshi* and an MP are construed as separate scalar terms, and the complex expression as a whole is not considered to be a single scalar term. This avoids the semantic conflict between *sukoshi*'s precise implicature and the imprecise meaning of the complex scalar expression (as a whole).

[16] Thanks to Mingya Liu for the idea on the relevance to the context of negotiation.

object. However, as observed above, *chotto*, but not *sukoshi* can also operate in a speech act, as in (58):

(58) {*Chotto / *sukoshi*}   *hasami   aru*?
     a bit   / a bit   scissors   exist
     At-issue meaning: Do you have scissors?
     Not-at-issue meaning: I am weakening the degree of the force of my request.
     (Matsumoto 1985, Sawada 2010)

The fact that the expressive *chotto* quantifies over an utterance rather than an individual is supported by the fact that it can co-occur with at-issue intensifiers or emphatic NPI items (Israel 1996), as in (59):

(59) a. *Chotto   jikan-ga   zenzen   nai-desu.*
       chotto   time-NOM   at all   NEG-PRED.POL
       'Chotto I don't have time at all.'
   b. *Chotto   koko-wa   kanari   kiken-desu.*
       chotto   here-TOP   quite   dangerous-PRED.POL
       'Chotto this place is quite dangerous.'

     In terms of the status of meaning, unlike the 'ordinary *chotto*,' the expressive *chotto* is a pure CI (Sawada 2010), as in (60):

(60) A: {*Chotto/*sukoshi*}   *jikan-ga   nai-desu.*
       a bit/a bit   time-NOM   NEG.EXIST-PRED.POLITE
       'Chotto I don't have time.'
       ('I am weakening the degree of the force of my assertion.')
   B: *Iya,   sore-wa   uso-da.*
      no   that-TOP   false-PRED
      'No, that's false.'

The meaning of the expressive *chotto* can have scope beyond the complement of an attitude predicate and can be anchored to a speaker, as in (61):

(61) (Context: a secretary is telling a visitor about Prof. Yamada's schedule.)
     Yamada-sensei-wa   konsyuu-wa   chotto   o-jikan-ga
     Yamada-teacher-TOP   this week-TOP CHOTTO   HON-time-NOM
     nai-to   omo-te-orare-masu.
     NEG.EXIST-that   think-TE-SUB.HON.PRED.POL
     At-issue meaning: Professor Yamada thinks that this week he does not have time.
     CI: I am weakening the force of my assertion.

     What exactly is then the meaning of the expressive *chotto*? I argue that the expressive *chotto* conventionally implies that the degree of the imposition of the speaker's utterance on the hearer is low:

(62) [[chotto$_{\text{EXPRESSIVE}}$]]
     = $\lambda u. \exists d[d >_{\approx} \text{STAND}_{\text{imposition}} \wedge \text{imposition-on-h}(u) = d] \wedge \exists d_1[d_1 < \text{STAND}_{\text{precise}} \wedge$
     $\text{precise}(\text{scale}_G) = d_1$

(where *u* is a variable for a speech act (utterance) and *h* is a hearer).

This analysis naturally explains why *chotto*, but not *sukoshi*, developed this pure expressive use. The degree of the imposition of a speech act is not something that can be measured precisely.

This analysis also correctly captures the relationship between the expressive *chotto* and the degree minimizers. My analysis predicts that since it operates on a speech act level it can naturally co-occur with the degree *chotto* which is part of a propositional content.[17] As the following examples show, this prediction is borne out:

(63) *Chotto   kore-wa   chotto   ii-sugi-desyoo-ka.*
    a bit   this-TOP   a bit   say-excessive-PRED.POLITE-Q
    '*Chotto,* is it saying a bit too much?'
    (http://keroctronics.hatenablog.com/entry/2016/02/18/235800)

(64) *Chotto   kyoo-wa   sukoshi muzukashii-kamosiremasen-nee.*
    a bit   today-TOP   a bit   difficult-may-Prt
    'Well, *chotto,* it may be a bit difficult (to do something) today.'
    (http://bizacademy.nikkei.co.jp/business_skill/shaberi/article.aspx?id=MMACi8000019
    012016&page=5)

Note that since the expressive *chotto* scopes over an entire utterance, it can actually co-occur with an intensifier as well:

(65) *Chotto   kore-wa   kanari   juushoo-desu.*
    a bit   this-TOP   quite   serious-PRED.POLITE
    '*Chotto,* this is quite serious.'
    (http://donya.sakura.ne.jp/keiba/2016/02/12/kasamatukeiba2-12-kekka/)

These data further support the idea that the expressive *chotto* operates on a speech act level.

6 Minimizer NPIs in Japanese

In the previous sections, I investigated the meaning of positive polarity minimizers. In this section, I investigate the relationship between PPIs and NPIs. An interesting point is that a distinction between the precise and imprecise modes of measurement exists in the negative polarity counterparts of *sukoshi* and *chotto* (i.e., *sukoshi-mo* 'a bit-even' and *chitto-mo* 'a bit-even'), as shown in (66):

(66) {*Chitto-mo / sukoshi-mo*}   *kion-ga*   *agara-nai.*
    a bit-even / a bit-even   temperature-NOM   rise-NEG
    'The temperature doesn't rise even a bit.'

Both the sentence with *sukoshi-mo* and the sentence with *chitto-mo* convey that the degree of the rise of temperature is zero. However, they differ in terms of granularity. *Chitto-mo* measures degree based on an imprecise scale, whereas *sukoshi-mo* measures degree based on a precise scale. Intuitively, *chitto-mo* is more emotional than *sukoshi-mo*. Typically, *chitto-mo* is used to convey a complaint by the speaker. This makes sense considering that the

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[17] Thanks to Mingya Liu for bringing this to my attention.

granularity of scale of *chotto* is coarser than that of *sukoshi*.

Note that there is also a similarity between NPIs and minimizer PPIs in terms of distribution pattern. In the noun modifying environment, only *sukoshi* can be used naturally, as shown in (67) and (68):

(67) a. *Sukoshi-no   okane-mo   nai.*
          a bit-GEN   money-MO   NEG
          'I don't have money at all.'
     b. ?? *Chotto-no   okane-mo   nai.*
           a bit-GEN   money-MO   NEG
           'I don't have money at all.'

(68) a. *Sukoshi-no   jikan-mo   nai.*
          a bit-GEN   time-MO   NEG
          'I don't have time at all.'
     b. ?? *Chotto-no   jikan-mo   nai.*
           a bit-GEN   time-MO   NEG
           'I don't have time at all.'

Let us now consider how minimizer NPIs are interpreted in a compositional manner. The crucial point of minimizer NPIs is that there an emphatic scalar particle *mo*. Regarding the meaning of *mo*, I assume that it has the meaning reflected in (66), similar to the English *even*:

(69) $[[mo]] = \lambda p \forall q \in ALT[p <_\mu q].\ p$

The particle *mo* introduces a set of alternative propositions and presupposes that p is the least likely among the relevant alternatives. It also semantically denotes *p*. It has both a presupposition and an at-issue meaning (the ordinary semantic value) (Karttunen and Peters 1979).

Following the idea of alternative semantics (e.g., Rooth 1985), I assume that the set of alternative propositions are alternative denotations determined by the placement of focus (here the element attached to *sukoshi/chitto*), as in (70):

(70) {[*Chitto*]$_F$-*mo* / [*sukoshi*]$_F$-*mo*}   *kion-ga*   *agara-nai.*
       a bit-even /   a bit-even   temperature-NOM   rise-NEG
       'The temperature doesn't rise even a bit.'

At the lexical level, the items that are alternatives to *sukoshi/chotto* will be scalar modifiers that have higher scalar meaning, such as *maamaa* 'more or less,' *totemo* 'very,' etc. More formally, the set of alternatives to *sukoshi* and *chotto* in (71) can be represented as in (72):

(71) a. $[[sukoshi]]: <<d^a, <e^a,t^a>>, <e^a,t^a>> \times t^s$
         $= \lambda G \lambda x \exists d[d >_\approx STAND_G \wedge G(d)(x)]$ ♦ $\exists d_1[d_1 > STAND_{precise} \wedge precise(scale_G) = d_1]$

      b. $[[chotto]]: <<d^a, <e^a,t^a>>, <e^a,t^a>> \times t^s$
         $= \lambda G \lambda x \exists d[d >_\approx STAND_G \wedge G(d)(x)]$ ♦ $\exists d_1[d_1 < STAND_{precise} \wedge precise(scale_G) = d_1]$

(72) ALT(sukoshi/chotto) = {$\lambda G\lambda x\exists d[d> STAND_G \wedge G(d)(x)]$: $d > d_{min}$}
(where d_{min} is a degree denoted by *sukoshi/chotto*)

These alternatives are computed in the same manner as *sukoshi/chotto*, in a pointwise fashion (see Kratzer and Shimoyama 2002). The at-issue meanings of (70) without *mo* and its alternatives are given in (73):

(73) a. at-issue meaning:
          $\neg\exists d[d>_{\approx} STAND_G \wedge rise(the\ temperature) = d]$
      b. propositional alternatives:
          {$\neg\exists d'[d'>STAND_G \wedge rise(the\ temperature) = d']$: $d' > d_{min}$}

At the final stage of the derivation, *mo* takes the at-issue proposition and induces the meaning in (74):

(74) MO($\neg$(the temperature rises [sukoshi]$_F$))
      = $\forall q\in ALT$ [$\neg\exists d[d>_{\approx} STAND_G \wedge rise(the\ temperature)=d] <_\mu q$]. $\neg\exists d[d>_{\approx} STAND_G \wedge rise(the\ temperature) = d$]

The presupposition posits that the proposition that 'there is no degree such that the temperature rises a bit' is less likely than the alternatives. Thus, the proposition that the temperature rises a bit is more likely than the alternatives (e.g., the temperature rises sharply).
      The crucial point is that the exhaustive operators MO and NEG can only interact with the 'at-issue part' of a minimizer. The CI meaning of *sukoshi/chotto* cannot interact with negation or any logical operators including F because they are independent of 'what is said.' Thus, both minimizer NPIs and minimizer PPIs have the same CI meanings, as shown in (75):

(75) a. CI meaning of *sukoshi*/*sukoshi-mo*:
          $\exists d_1[d_1 >STAND_{precise} \wedge precise(scale_G) = d_1]$
      b. CI meaning of *chotto*/*chitto-mo*:
          $\exists d_1[d_1 <STAND_{precise} \wedge precise(scale_G) = d_1]$

I have so far discussed the meaning of minimizer NPIs and shown that there is a semantic parallelism between minimizer PPIs and minimizer NPIs. However, it is important to note that there is also an important difference between the two, namely that there is no purely expressive use in minimizer NPIs. Unlike *chotto*, *chitto-mo* does not have a pure expressive/speech act use, as shown by (76):

(76) Expressive reading
      ?? *Chitto-mo   sore-wa   deki-masen.*
          a bit-even   that-TOP   can-POL.NEG
          '*Chitto-mo*, I cannot do it.'

This makes sense considering the fact that CIs are independent of logical operators. Thus, it cannot fall under a scope of negation. This can be generalized as in (77):

(77) **Generalization on PPIs and NPIs**: Only a PPI can be a pure expressive.

Interestingly, this generalization also applies to the case of '1 plus the numeral classifier', i.e. *hito-tu* 'one-CL'. The numeral classifier *hito-tu* is a PPI. This is supported by the fact that when it is used in the negative context as in (78b), it outscopes negation:

(78) a. *Taro-wa   ringo-o   hito-tu   tabe-ta.*
     Taro-TOP   apple-ACC   one-CL   eat-PAST
     'Taro ate one apple.'
   b. *Taro-wa   ringo-o   hito-tu   tabe-na-katta.*
     Taro-TOP   apple-ACC   one-CL   eat-NEG-PAST
     'Taro didn't eat an apple.' (There is one apple that Taro didn't eat.)

Note that, similarly to the case of minimizers *sukoshi/chotto*, if we add the focus particle *mo* to *hitotu* (i.e. *hitotu-mo*), it behaves as an NPI. As the following examples show, *hitotu-mo* cannot appear in a positive sentence:

(79) a. *Taro-wa   ringo-o   hito-tu-mo   tabe-na-katta.*
     Taro-TOP   apple-ACC   one-CL-even   eat-NEG-PAST
     'Taro didn't eat even one apple.'

   b. **Taro-wa   ringo-o   hito-tu-mo   tabe-ta.*
     Taro-TOP   apple-ACC   one-CL-even   eat-PAST
     '*Taro even ate one apple.'

Crucially, *hito-tu* has an expressive use as well:

(80) {*Hitotu/chotto*}   *ya-tte   miy-oo.*
     HITOTU/a bit   do-TE   try-VOLITIVE
     'Let's just try it.'

Hitotu in (80) is semantically similar to the expressive *chotto* in that it conveys a casualness. It is especially used in the context of trying or requesting, and conveys that the speaker's utterance/act is not serious.[18] Since the expressive use of *hito-tu* in (80) is not counting anything, it seems possible to consider that *hito-tu* has been declassified/conventionalized into the independent expressive/pragmatic marker *hitotu*. (The numeral classifier *tu* can count inanimate and separable objects, but it cannot count an event/activity. Note that in the gloss, I have glossed it as a single morpheme).

     In this paper I have only looked at "1 plus a numeral classifier" as an additional data, but I assume that the generalization in (77) is cross-linguistically/language-internally valid.[19]

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[18] There is also a formulaic expression *hitotu yoroshiku onegai simasu* 'Hitotu please treat me well' which is used for asking a favor in a polite way:

(i) {*Hitotu/??chotto*}   *yoroshiku   onegai-si-masu.*
     HITOTU/Chotto   YOROSHIKU   request.POLITE-do-PRED.POLITE
     '*Hitotu*, please treat me well/please do it.'

The whole phrase is highly conventionalized and it is odd to use the expressive *chotto* in this expression.
[19] Note that in Japanese *hitotu* can actually make use of NPI EVEN. *Hitotu* can function as a

7 Varieties of minimizers

I have so far focused mainly on the minimizers related to *sukoshi* and *chotto*. In this section, I consider variations of minimizers from a broader perspective. In section 7.1, I compare *sukoshi/chotto* to *wazukani* 'slightly'/*wazuka-no* 'scant' In section 7.2, I briefly compare Japanese minimizers to minimizers in English and Greek.

7.1 Comparison to *wazukani* 'slightly'

The use of the Japanese words *wazukani* 'slightly' and *wazuka-no* 'scant/very little' is shown in (81) and (82):

(81) *Kono   biru-wa   wazukani   katamui-teiru.*
    this   building-TOP   slightly   incline-TEIRU
    'This building is slightly inclined.'

(82) *Wazuka-no   mizu*
    slight-GEN   water
    'a very little amount of water'

As is clear from the above examples, their distribution is quite similar to that of *sukoshi*, but intuitively, *wazukani* is more precise than *sukoshi* in terms of granularity.[20] The difference can be captured formally based on variation 'greater than relation,' with *wazukani* denoting that a given degree is much greater than a standard ('>!!' stands for 'greater than a contextual standard by a large amount' (Kennedy and McNally 2005)), as set out in (83):

(83) a. [[wazukani]]: $<<d^a, <e^a,t^a>>, <e^a,t^a>> \times t^s$
    $= \lambda G \lambda x \exists d[d >_{\approx} \text{STAND}_G \wedge G(d)(x)] \blacklozenge \exists d_1[d_1 >!! \text{STAND}_{precise} \wedge precise(scale_G) = d_1$

  b. [[sukoshi]]: $<<d^a, <e^a,t^a>>, <e^a,t^a>> \times t^s$
    $= \lambda G \lambda x \exists d[d >_{\approx} \text{STAND}_G \wedge G(d)(x)] \blacklozenge \exists d_1[d_1 > \text{STAND}_{precise} \wedge precise(scale_G) = d_1$

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scalar focus particle, and in this use it has to appear in a negative context (Sawada 2007; Nakanishi in prep):

(i) *Taro-wa   aisatu-hitotu   deki-nai.*
   Taro-TOP   greeting-HITOTU   can-NEG
   'Taro cannot even greet people.'

At first the NPI *hitotu* seems to be a counterexample of the generalization in (77) because in (i) its meaning is not at issue (it is a conventional implicature/presupposition (cf. Kartunnen and Peters 1979)) although it behaves like an NPI. However, it is important to note that the non-expressive use of *hitotu* is a PPI. Thus this does not violate the generalization that only a PPI can be a pure expressive.

[20] Note there is no NPI form *wazukani-mo*. However, there is an NPI form *wazuka-no* NP-*mo*, as illustrated in (i):

(i) *Wazuka-no   okure-mo   mitome-nai.*
   slight-GEN   deley-MO   permit-NOT
   'We will not accept even the slightest delay.'

One might consider an alternative approach in which *wazukani* 'slightly' merely encodes a lower degree than *sukoshi/chotto* 'a bit' and there is no difference in terms of granularity. However, there is a problem for such view. This alternative approach would predict an entailment relationship between a sentence with *wazukani* and a sentence with *sukoshi/chotto* based on the Horn scale *<sukoshi/chotto, wazukani>*. However, the entailment pattern in (84) is odd:

(84) ??*Kono   kugi-wa   wazukani   magat-teiru-ga   {sukoshi / chotto}*
         this   nail-TOP   slightly   bend-TEIRU-but   a bit / a bit
         magat-teiru-wake.de.wa.nai.
         bend-TEIRU-it is not the case
         'This nail is slightly bent, but it is not the case that it is a bit bent.'

Notice that *wazukani* 'slightly' and *totemo* 'very' in (85) form a Horn scale *<totemo, wazukani>*:

(85) *Kono   kugi-wa   {wazukani/sukoshi}   magat-teiru-ga   totemo*
         this   nail-TOP   slight   /a bit   bend-TEIRU-but   very
         magat-teiru-wake.dewa.nai.
         bend-TEIRU-it is not the case
         'This nail is slightly bent but it is not the case that it is very bent.'

Likewise, *tetemo* 'very' and *sukoshi/chotto* 'a bit' in (86) also have an entailment relationship *<totemo, chotto/sukoshi>*:

(86) *Kono   kugi-wa   {sukoshi / chotto}   magat-teiru-ga   totemo*
         this   nail-TOP   a bit / a bit   bend-TEIRU-but   very
         magat-teiru-wake.dewa.nai.
         bend-TEIRU-it is not the case
         'This nail is a bit bent, but it is not the case that it is very bent.'

The fact that there is no entailment pattern between the sentence with *wazukani* and the sentence with *chotto/sukoshi* suggests that *sukoshi/chotto* and *wazukani* are only different in terms of the level of granularity.

7.2 Cross-linguistic variation: comparison with English and Greek minimizers

Finally, let us briefly consider the cross-linguistic variation of minimizers. In terms of granularity, it seems that the English *a bit* and *a little* are similar to the Japanese *sukoshi*, and the English *slightly* is similar to the Japanese *wazukani*.

It has been pointed out in the literature that minimizers can naturally combine with an absolute gradable predicates like *bent*, *open*, which posit a minimum value (zero point) as a standard of measurement, they cannot usually combine with a relative gradable predicate which posits a contextual standard (Rotstein and Winter 2004; Kennedy and McNally 2005; Kennedy 2007), as shown in (87):

(87) ?? *John is {slightly/a bit/a little} tall.*   (tall = a relative gradable adjective)

However, several researchers have recently shown that low scale minimizers in

English can in fact be combined with a relative gradable adjective if used for a 'purpose/functional' reading (Kagan and Alexeyenko 2011; Bylinina 2012; Solt 2012, 2015), as in (88):

(88) a. *This swimming pool is {slightly/a little/somewhat} deep for a three-year old.*
                                                          (Bylinina 2012)
      b. *The actress is slightly tall to play the part.*   (Solt 2015)
      c. *The jacket sleeves are a bit long.*   (Solt 2015)

In these examples, the standard corresponds to the maximum degree that is suitable for a given function or purpose (Bylinina 2012; Solt 2012). This intuition also occurs in the case of *sukoshi* and *wazukani*. When *sukoshi* and *wazukani* are used, the standard of measurement is specific, and it is odd to use them in a context where a vague contextual standard is involved (see section 4.5).

On the other hand, the Greek minimizer *ligi/ligo* is similar to *chotto*. It can be used both in the context of amount measurement and expressive measurement, as shown in (89).[21]

(89) Greek
      a. *Ligi*   *brizola*   *parakalo*?   (*Amount reading*)
         a bit.feminine   steak   please
         'Please give me a bit of steak.'

      b. *Ligo*   *brizola*   *parakalo*?   (*Expressive reading*)
         a bit.neuter   steak   please
         'LIGO, please give me steak.'

                                      (Anastasia Giannakidou, personal communication)

Although extensive further surveys are necessary to clarify the entire picture of cross-linguistic variation, I think that variation can be explained based on the not-at-issue component (i.e., variation of granularity level in the CI domain, and the possibility of a pure expressive).

8 Conclusion

In this paper, I have investigated the meanings and uses of the Japanese positive polarity minimizers *sukoshi* 'a bit' and *chotto* 'a bit,' and considered the source of variation in the meaning of minimizers and the relationship between PPIs and NPIs.

I argued that in Japanese, minimizers can posit different levels of granularity at the not-at-issue level (CI): *sukoshi* conventionally implies that the speaker is measuring degree based on a precise scale, whereas *chotto* conventionally implies that the speaker is measuring degree based on imprecise (coarse) scale. I argued that this distinction is reflected in their distribution patterns: *sukoshi*, but not *chotto*, can naturally be used for the measurement of quantity. On the other hand, *chotto*, but not *sukoshi*, can naturally be used in measuring the degree of emotion, approximate measurement with a measure phrase (MP and *a bit more*), and typical norm-related measurement. I also claimed that the difference in the level of granularity can naturally explain why *chotto*, but not *sukoshi*, was able to develop a speech act modifying use.

With regard to the relationship between PPIs and NPIs, I claimed that a distinction

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[21] Thanks to Anastasia Giannakidou for providing the Greek data and helpful discussion.

between the precise and imprecise modes of measurement exists in the negative polarity counterparts of *sukoshi* and *chotto* (i.e., *sukoshi-mo* 'a bit-even' and *chitto-mo* 'a bit-even'). However, I also showed that unlike *chotto*, *chitto-mo* has not developed the pure expressive use due to the issue of compositionality.

I propose that the phenomena of Japanese minimizer PPIs and minimizers in other languages strongly suggest that looking at the not-at-issue realms of minimizers is crucial to clarifying cross-linguistic and language-internal variation in minimizers, as well as the relationship between PPIs and NPIs. I hope that this paper has provided new perspectives regarding the source of variation in minimizers and the relation between minimizer PPIs and minimizer NPIs.

In future studies, I aim to consider the case of maximizer PPIs (Israel 1996). In Japanese, intensifiers like *totemo* 'very' and *kyokutanni* 'extremely' are PPIs. They cannot naturally occur in a normal negative sentence, as shown in (90):

(90) a. *Taro-wa   se-ga   {totemo/kyokutan-ni}   takai.*
       Taro-TOP   height-NOM   very/extreme-ly   high
       'Taro is very/extremely tall.'
    b. ?? *Taro-wa   se-ga   {totemo/kyokutan-ni}   takaku-nai.*
        Taro-TOP   height-NOM   very/extreme-ly   tall-NEG
        'Taro is not very tall/extremely tall.'

Note that if a contrastive topic *wa* is added to *takaku* or to *kyokutan-ni* (e.g., *kyokutan-ni-wa*), then the negative sentence becomes natural, but in that case the negation is interpreted as contrastive negation/emphatic denial (not regular negation). As Szabolcsi (2004) also states, PPIs can in fact occur within the immediate scope of clausemate negation if the latter is construed as emphatic denial/metalinguistic negation.

The question is: Is imprecision relevant to other scalar modifiers such as high scalar modifiers? It seems that *kyokutan-ni* 'extremely' is semantically stronger than *totemo* 'very' in terms of its entailment relationship, and there seems to be no difference in terms of granularity, as shown in (91):

(91) *Taro-wa   se-ga   totemo   takai-ga kyokutan-ni   takai-wakedehanai.*
    Taro-TOP   height-NOM   very   tall-but   extreme-ly   tall-it is not the case that
    'Taro is very tall, but it is not the case that he is extremely tall.'
    (cf. ??This rod is slightly bent, but it is not a bit/a little bent.)

If this is true, the question is: Why is it that imprecision is relevant to low scalar modifiers, but not to high scalar modifiers? It seems to me that granularity may be involved in low degree words but not in high degree words. Intuitively, positing different levels of granularity (precision) is important for low scalar predicates, because in low scalar modifiers, the gap between a target and a standard is small. As the gap is small, it is cognitively not easy to differentiate different minimizers by degrees. There may be a fundamental difference between high and low degree polarity items in terms of the source of variation.

Acknowledgments

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