

How *Even* Revises Expectation in a Scalar Model: Analogy with Japanese *Mo**

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Abstract. This study, concentrating on multi-focus usages of scalar additive particles, such as English *even*, *mo* in Japanese and *to* in Korean, shows that they signal the survival of a correlational continuum in a scalar model despite the described unexpected event. This analysis, building upon the scalar model proposed by Fillmore, et al (1988) and Kay's (1990) analysis of *even*, extends Shudo's analysis (1998, 2002) of *mo* and claims that *even* behaves like scalar *mo* and *to*.

Keywords: scalar, additive, presupposition, *even*, *mo*, *to*, expectation

1. Introduction

The usages of some linguistic expressions and constructions are constrained such that certain conditions must be satisfied by the context. When such a linguistic item is used, the hearer simply assumes that the required condition has been satisfied. In other words, some information is delivered to the hearer because of the presence of the linguistic item. In this paper, the information that is delivered to the hearer in this process is referred as 'presupposition'. This notion of presupposition is closest to Stalnaker's (1973) notion of presupposition. The difference is that while Stalnaker's notion refers to the relation between a person and a proposition, I would like to think it as one between a sentence containing a presupposition-trigger and a presupposed proposition, following Karttunen (1974). Although the notion of presupposition is so ubiquitous, how to identify it has not been clear. The dominant approach to identify a presupposition is to try to isolate the non-truth-conditional meaning in a given sentence that includes the presupposition-trigger. In other words, what we often assume to be a presupposition triggered by a linguistic item is discussed rather subjectively.

In this study, following the approach employed in Shudo (1998, 2002) and Shudo and Harada (2008), I will try to identify a presupposition by reconstructing a condition that the context must satisfy in order for the speaker to use the presupposition-trigger. In particular, I will investigate the presupposition of *even*. The basic explanation for the assumed equation between the presupposition of a linguistic item and the contextual constraint on the usage of the item is simple: if a meaning is generated because of the usage of a presupposition-trigger, that is because the linguistic item is constrained such that it cannot be used unless the condition generating the meaning is satisfied.

Shudo (1998, 2002), following Kay's (1990) analysis on *even*, contended that the Japanese particle *mo*, which is equivalent to *too* or *also* and sometimes is used to generate the *even*-like meaning, is different from the English *even*. However, in this paper, I will argue that the meaning of *even* is indeed quite similar to the Japanese *mo*.

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2. Problem

While there are disagreements on details, most works on *even* agree that *even* triggers two types of presupposition, existential presupposition and scalar presupposition (Horn 1969, 1972, Karttunen and Karttunen (K&K) 1977, Karttunen and Peters (K&P) 1979, Rooth 1985, Kay 1990, Wilkinson 1996, Schwarz 2005, Nakanishi 2006, inter alia).¹ (1a) gives a rise to an existential presupposition, shown in (1b), and a scalar presupposition, shown in (1c).

- (1) a. Even Emily smiled.
b. Someone other than Emily smiled.
c. Emily is a less likely (or the least likely) candidate to smile.²

In this paper, as mentioned earlier, whatever meaning is generated by the usage of *even* is assumed to be the result of the constraint on the usage such that it cannot be used unless the condition is satisfied. This paper contends that existing accounts for presupposition triggered by *even* are correct but not sufficient to explain the presupposition because *even* may not be used although the context satisfies the above mentioned two types of presupposition.

Let us start with a scenario. Amelia (A) teaches German in a college. Brenda (B) is her colleague who also teaches the same class. Harry is one of the least proficient students. One day Brenda gave students a quiz. When Brenda comes back from the class, the following conversation begins.

- (2) a. A: Hi. How was the quiz?³
b. B: I am afraid it was too easy.
c. Even Harry got seven right answers.

Now let us observe the following in which Amelia starts differently. She has been lately quite concerned with Harry's academic performance.

- (3) a. A: Hi. How did Harry do on the quiz?
b. B: #Even he got seven right answers.

(2c) and (3b) offer exactly the same semantic content. As for the performances of students on the quiz, not only Harry's but also those of others, the context of (2) and (3) should be identical. In other words, what applies to the usage of *even* in (2), the existential presupposition, the scalar presupposition, etc, is expected to be present in (3). However, the usage of *even* in (3b) is problematic. It is obvious that the inappropriateness of (3b) has something to do with Amelia's question. However, we can easily come up with a slightly different context in which (3b) is not problematic such as the following.

- (4) a. A: Hi. How was the quiz?
b. B: Everyone did very well.
c. A: How did Harry do?
d. B: Even he got seven right answers.

¹ K&K (1977), K&P (1979) and Wilkinson (2005) treat these non-truth-conditional propositions associated with *even* as conventional implicature.

² K&K (1977), K&P (1979), and Nakanishi (2006) take the end-point view.

³ With 'Hi' in (1a), (2a) and (3a), I merely intend to indicate is that there is no prior conversation on the same subject.

How should we explain the difference in acceptability between (3b) and (4d)? What is the constraint on the usage of *even* that (3b) does not satisfy but (4d) does. (4) includes the exchange about the quiz in general. Why does the exchange in (4a)-(4b) make it appropriate to use *even* in (4d)? To answer these questions, I hypothesize that there is a contextual constraint on the usage of *even* that the existing accounts on its presupposition have not identified.

In the following, I will first examine Japanese and Korean additive particles, *mo* and *to* respectively, and show how they are contextually constrained. I will then show how they generate the *even*-like meaning. The difference between English *even* on one hand and Japanese *mo* and Korean *to* on the other hand is that the former inherently places the host proposition on a scale, the latter generate the scalar meaning when the scale becomes available with the context. I will show that the English *even* is indeed contextually constrained in a similar manner.

3. Additive *mo* and *to*

The Japanese *mo* and the Korean *to*, both roughly equivalent to the English *also*, are often used to generate scalar meanings similar to the English *even*, while *also* and *too* cannot generate such meanings. Before discussing *even*-like *mo* and *to*, I will first examine basic operations of *mo* and *to*, which I claim monosemously apply to usages including those with scalar meanings.

3.1 Traditional approaches

According to conventional grammars, the use of the Japanese particle *mo* is described with examples in which the *mo* sentence contains a property which has been evoked in the prior context as the following example shows:

- (5) a. Boku wa Osaka ni ikimasu.
 I TOP to go
 'I am going to Osaka.'
 b. Watashi *mo* Osaka ni ikimasu.
 I c ADD to go
 'I am going to Osaka, too.'

Defining the proposition of the *mo* sentence ((5b) above) as the HOST PROPOSITION or the hp and the proposition that the host proposition is responding to ((5a) above) as the ANTECEDENT PROPOSITION or the ap, the usage of *mo* in (5b) is summarized as follows:

- (6) MO (x, F) (x is the constituent marked by *mo*; F is the property held by x)
 hp: F(x)
 ap: F(y)
 Mo-presupposition: $\exists y [y \neq x \ \& \ F(y)]$

Kato (1985), Makino and Tsutsui (1986) and Noguchi and Harada (1994, 1996) share the analysis of *mo* in (6).⁴

The Korean counterpart *to* receives similar traditional analyses (Lee 2006, An 2007).

- (7) TO (x, F) (x is the constituent marked by *to*; F is the property held by x)
 To-presupposition: $\exists y [y \neq x \ \& \ F(y)]$

The above analyses of both *mo* and *to* are basically the same as Karttunen's (1974) analysis of *too*. The difference between *mo* in (6) and *to* in (7) on one hand and *too* on the other hand is that the former syntactically mark x, while the latter phonologically marks x by focus.

⁴ Noguchi and Harada (1994), indicating the meaning of a *mo* sentence as $F(x) \wedge \square y [y \neq x \ \& \ F(y)]$, do not make a distinction between what is asserted and what is presupposed.

3.2 Bridge-building usages of *mo*

Shudo (1998, 2002) shows that the actual usages of the Japanese particle *mo* indicate that (6) is not sufficient to describe the relationship between the host proposition and the antecedent proposition. Examine the following, what Shudo describes as a “BRIDGE-BUILDING” usage:

- (8) a. Boku wa Tokyo ni ikimasu.
 I TOP to go
 ‘I am going to Tokyo.’
 b. Watashi *mo* Osaka ni ikimasu.
 I ADD to go
 ‘I am going to Osaka, too.’

The usage of *mo* in (8b) is not strange if the above exchange happens outside Japan. It simply points out the similarity between the two events, the first speaker’s going to Tokyo and the second speaker’s going to Osaka, i.e., both speakers are going to Japanese cities. Numata (1984, 1986, 1995, *inter alia*) addresses such usages, pointing out that although there is no lexicologically synonymous relation between the properties, there is context-dependent similarity (1995: 136). Her discussion on this issue, however, rather abruptly ends with the remark that how the similarity occurs depends on the context or social common sense.

Shudo’s (1998, 2002) solution is that the usage *mo* of is not constrained such that the properties are identical, but merely is constrained such that the properties are similar, treating the bridge-building usage of *mo* in (8) as the canonical usage of the particle, and leaving (5) as a special case in which the similarity between two events amounts to the extent that the two properties are identical. As the two properties present some similarity, the presence of a common property is necessary as the following

- (9) MO (x, F)
 hp: F(x)
 ap: G(y)
 $\exists y \exists H [y \neq x \ \& \ H(y) \ \& \ F(x) \subseteq H(x) \ \& \ G(y) \subseteq H(y)]$

However, needless to say, (9) does not serve as a constraint unless the common property is lower-bounded. Otherwise, any property, such as going somewhere or doing something, can satisfy the common property requirement. The constraint could be intuitively represented as requiring that it is worthwhile for the speaker to signal the similarity.

To represent the ‘worthy similarity’ requirement, Shudo (1998, 2002), employs the notion of ‘contextual effect’ by Sperber and Wilson (S&W hereafter, 1986). The lower-boundary for the common property is represented as follows:

- (10) $\exists y \exists H [y \neq x \ \& \ H(y) \ \& \ F(x) \subseteq H(x) \ \& \ G(y) \subseteq H(y) \ \& \ R(H(x), C)]$

The similarity is lower-bounded by the presence of a ‘contextual effect’ in the proposition with the common property (H(x)) in the context, C. S&W’s notion of contextual effect is a central notion for their theory of relevance, but in this paper, I will simply apply the notion in order to identify whether a proposition contributes to a set of propositions in a certain way. The set of propositions that I am interested here is the context, the set of propositions that the speaker and the hearer share at the time of utterance.⁵

⁵ Sperber and Wilson (1986) uses the term ‘context’ to refer to a set of assumption. Their claim is a ‘context’ is not determined but selected by the speaker to process information. Thus, I am not using the term in the way S & W use it.

According to S&W, a piece of information has a contextual effect in a set of assumptions if it has a contextual implication, strengthens the existing assumptions, or contradicts the existing assumptions. For the constraints of time and space, I will explain their account of how contextual implication occurs.

(11) Contextual implication [S&W 1986: 107-108]

A set of assumptions P contextually implies an assumption Q in a context C if:

- (i) the union of P and C non-trivially implies Q,
- (ii) P does not non-trivially imply Q, and
- (iii) C does not non-trivially imply Q.

(12) Non-trivial implication [S&W 1986: 97]

A set of assumptions P logically and non-trivially implies an assumption Q if and only if, when P is the set of initial theses in a derivation involving only elimination rules, Q belongs to the set of final theses.

I apply the above notion of contextual effect to determine whether a proposition has certain contribution to the context. When a proposition P has a contextual effect in context C, I represent it as $R(P, C)$. The requirement for the proposition with the common property, $H(x)$, is expressed as $R(H(x), C)$ in (10).

3.3 Bridge-building usages of *to*

The Korean additive *to* is also used when the ap and the hp do not share the same property, but merely share a common property (Shudo, 2008). It seems that the usage of Korean *to* receives exactly the same constraint as its Japanese counterpart.

(13) a. Na-nun Tokyo-ey kamnida .

I-TOP to go
'I am going to Tokyo.'

b. Na-*do* Osaka-ey kamnida.

I-ADD to go
'I am going to Osaka, too.'

(14) TO (x, F)

hp: F(x)

ap: G(y)

$\exists y \exists H [y \neq x \ \& \ H(y) \ \& \ F(x) \subseteq H(x) \ \& \ G(y) \subseteq H(y) \ \& \ R(H(x), C)]$

Shudo (2008) claims that both Japanese *mo* and Korean *to* can generate the *even*-like scalar meaning because both particles are constrained such that they allow the bridge-building usages. This issue will be later discussed more in detail.

4. Analysis of *even*

Now we are back to the English *even*. The interpretation of a sentence including *even* requires the notion of scale. While the scale is usually assumed to be one-dimensional, a multi-dimensional scale may be needed if that is intended (Kay 1990).

4.1 Scalar model for *even*

Fillmore, Kay, and O'Connor (1988) (FKO hereafter) propose the notion of scalar model, which represents a set of propositions with internal structure of generalization to n dimensions, what is known as a Guttman scale. In a scalar model, there are entailment relations between propositions such that a propositional function P, whose domain is an argument space, is constrained as follows:

- (15) For distinct d_i, d_j in D_x , $P(d_i)$ entails $P(d_j)$ iff d_j is lower (or equivalently closer to the origin) than d_i .

Kay (1990), noting that *even* sentences like the following require two-dimensional scale, applies the above model to his analysis of two-dimensional *even*:

- (16) A: Can Stretch jump six feet?
 B: Sure. Dumpy can even jump seven feet.

- (17) A: Can Dumpy jump seven feet?
 B: No. Stretch can't even jump six feet.

For the above examples, Kay proposes a scalar model with a dimension of a set of jumpers ordered with respect to jumping ability and another dimension of a set of obstacles ordered with respect to difficulty (see Figure 1 for (16) and Figure 2 for (13)).

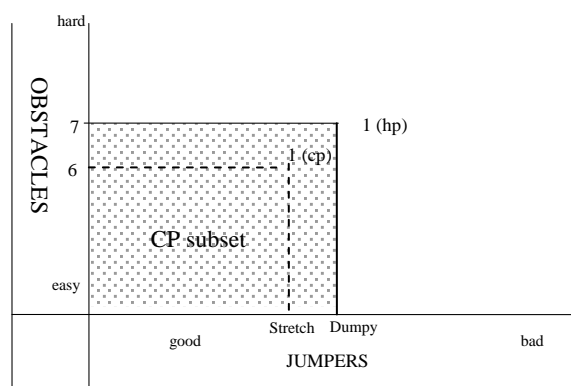


Figure 1(for (16) from Kay (1990))

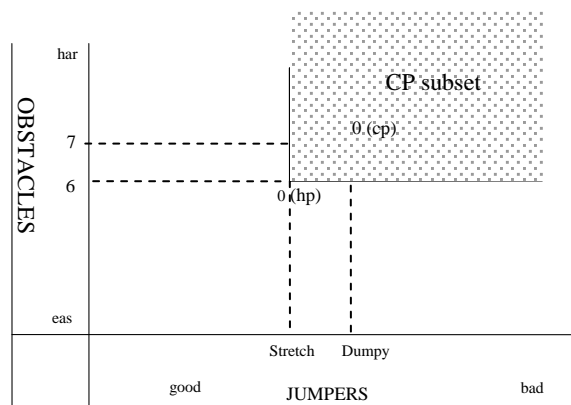


Figure 2 (for (17) from Kay (1990))

According to Kay, *even* indicates that the proposition of the *even* sentence (the hp in Figures 1 and 2) is more informative than some other proposition which is taken to be already present in the context (the context proposition or the cp in Figures 1 and 2) in the same scalar model. For example, as for (16), the truth condition of the proposition that *Dumpy can jump seven feet* (=the hp) entails the truth condition of the proposition that *Stretch can jump six feet* (=the cp). Kay points out that the cp is either explicitly present in the context as in examples (16) and (17) or generated through accommodation. Kay claims that the cp is a proposition less informative

than the hp in the scalar model and that *even* signals what the Maxim of Quantity (Grice 1975) tells us to optimize.

Shudo (1998, 2002) accepts Kay’s account on *even* and contends that the difference between the English *even* and the Japanese scalar *mo* is that, while the former relies on the informative relation in a scalar model between the hp and the cp, the latter relies on the similarity relation based on the monosemous account on *mo*. However, there are some usages that Kay’s account of the informative relation between the hp and the cp cannot handle. For examples, observe the following proverb about a blind squirrel.

(18) Even a blind squirrel finds an acorn sometimes.

This proverb has several variations in which sometimes is replaced by expressions such as “now and then,” “every now and then,” “once in a while,” “every once in a while,” etc. Whatever the expression is, it is clear that a blind squirrel is one of the least likely candidates “to find an acorn,” not “to find an acorn sometimes.” In other words, “sometimes” in (18) should be an item on a second dimension, the dimension of frequency to find an acorn. Then, what would be the cp that is less informative than the hp? These expressions to indicate infrequent occurrences of finding an acorn are definitely selected for their least likelihood. We can intuitively infer that *even* in (18) indicates seeing squirrels find acorns far more frequently than sometimes. However, an argument space corresponding to such a proposition is outside the CP subset as Figure 3 shows. If the informativeness relation of the *even* sentence is within the CP subset, why does (18) have an item that is closest to the origin on the vertical dimension? In the following, I will show that the operations of Japanese *mo* and Korean *to* interact not only with the Maxim of Quantity but also with the Maxim of Relevance (Grice 1975) and claim that the same operation applies to *even*.

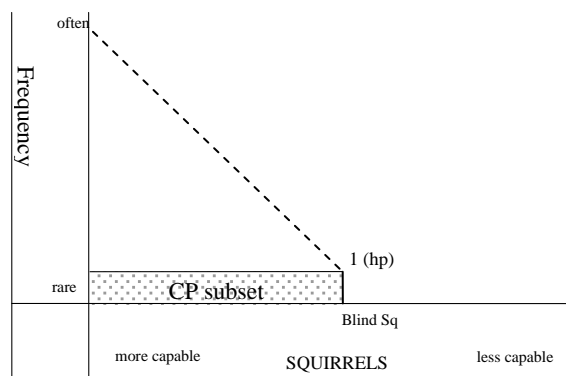


Figure 3(for (18))

4.2. *Even-like mo and to in scalar models*

Japanese *mo* generates scalar meanings similar to English *even* (Numata 1984, 1986, 1995, Sadanobu 1995, Noguchi and Harada 1994, 1996, Shudo 1998, 2002, inter alia). According to Noguchi and Harada (1994, 1996), the presence of scale is not semantically encoded in the particle, but is contextually provided. Shudo’s (1998, 2002) also claims that *even-like* meaning is generated in the interaction between the monosemous account of *mo* and the context which places the hp on a scale. *Mo* requires the presence of an ap either already evoked in the context or implicated as a result of ‘accommodation for presupposition’ (Lewis 1979). When there is no ap already evoked and when the context places the hp on a scale, an ap is implicated by the interaction of the hp and the scale.

According to Shudo (1998, 2002), it is too much for the hearer to identify the ap from the Mo-presupposition represented in (10). While Shudo (1998, 2002) discusses in detail how the contextual effect of H(x) in (10) determines the property of G(y), for the constraints of space and time, I will only make a simpler claim here that the ap has to be the one that interacts with H(x) so that H(x) can have a contextual effect.

When the scale is one-dimensional, accommodation for presupposition is a rather straightforward process. Observe the following:

(19) [John is one of the least likely candidates to laugh.]

John mo waratta.
 even laughed
 ‘Even John laughed.’

In (19), the scale consists of individuals ordered with respect to the likelihood of laughing. With such a one-dimensional scale, the ap implicated by the presence of *mo* is something like the following:

(20) Individuals who are more likely to laugh than John laughed.

In the above example, what is presupposed in the traditional approach applies to (20), which share exactly the same property as the hp.

Double-focus scalar *mo* sentences are not so simple. Observe the following:

(21) [Harry is one of the least proficient students. The speaker and the hearer are discussing how their students did on a recently administered quiz which had ten questions.]

Harry de mo nana-mon seikai datt-a.
 EMP even seven-questions right-answers COP-PAST
 ‘Even Harry got seven right answers.’

If we were to treat (21) the same way as (19)-(20), it would implicate the following:

(22) Students who are more proficient than Harry got seven right answers.

Our intuition tells us there is something strange about (22). There is of course nothing incorrect about the truth condition of (22). We do expect that students who are more proficient than Harry got *at least* seven right answers. However, what we infer from (21) is more like the following:

(23) Students who are more proficient than Harry got more than seven right answers.

The Korean equivalent sentence shown below generates the same inference as (23).

(24) Harry-do ilgob-gae majasseo-yo.
 -even seven-questions got-right-PAST
 ‘Even Harry got seven right answers.’

Let us observe the relationship between the argument spaces corresponding to the hp of (21)/(24) and (22) in a two-dimensional scalar model in Figure 4. The hp in Figure 4 shows the cell corresponding to (21)/(24). The argument spaces corresponding to (22) are at the upper boundary of the range covering cells in which the truth values are entailed by the truth value of the hp (the CP SUBSET).

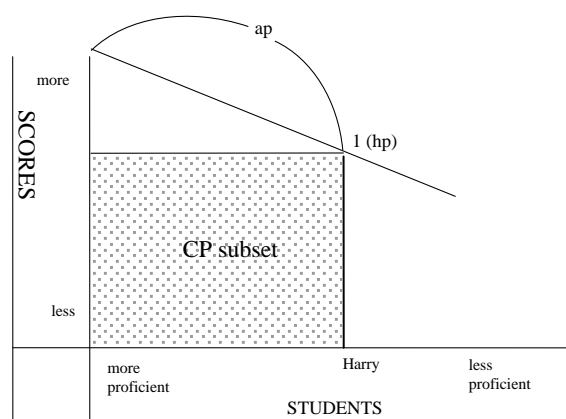


Figure 4

Now compare the above with what (23) expresses. The argument spaces corresponding to (23) are outside the cp subset. The process in which (23) is implicated is obviously quite different from what Kay (1990) defines as ‘entailment’ relation between the hp and the cp. Let us apply Shudo’s (1998, 2002) analysis of *mo* mentioned earlier (presented in (10)) to the above example. The hp (=F(x)) that Harry got seven right answers requires that the ap (=G(y)) share a common property (=H) and that H(x) have a contextual effect in the context. What is the entailment of the hp which has a contextual effect in the context? To answer the question, we should note that (21) does not really mean to provide information about Harry’s performance on the quiz. (21) is produced to indicate that the exam was easy and therefore students did better than expected.

(25) Harry did better than expected.

(26) Students more proficient than Harry did better than expected.

This property of having performed better than expected is held not only by Harry but also other students more proficient than Harry and thus (25) above is a good candidate for H(x). If we assume the property of having performed better than expected as H, (25) and (26) can serve as H(x) and H(y). Shudo (2008) claims that in order for the additive particles, such as Japanese *mo* and Korean *to*, to produce the scalar meaning, they must allow the relationship between the hp and the ap as propositions with ‘similar’ properties, not only identical properties as the traditional approach of these particles have put it.

4.4 Correlational expectation in a scalar model

It should be noted that the notion of scalar model with n dimensions, proposed by Fillmore, Kay and O’Connor (1988), explains an expectation of an event or a state from a set of expectations based on the n dimensions that are correlated. The items on a dimension and items on another dimension are arranged in particular orders so that there is a positive correlation between the two dimensions. In Kay’s examples of (16) and (17), jumpers are supposed to be ordered with respect to jumping ability, not with respect to cooking ability.⁶

⁶ To be rigid about the practical aspect of the scenario, it is rather unrealistic for the first speaker to ask the question: if s/he is expected to know the jumping ability of Stretch and Dumpy, why does s/he ask the question? We have to assume that s/he only knows their ‘relative’ jumping ability. To capture what Kay tries to represent in (16) and (17), it is better to assume that jumpers are ordered with respect to general physical ability, or something of the sort, that helps us make a prediction about jumping ability. Or, if the question were about the jumper’s performance on a particular day (“Did Stretch jump six

What is crucial about the notion of scalar model is that a positive correlation between the items of the orthogonal dimensions is always expected. Shudo (1998, 2002) calls such expectation the CORRELATIONAL EXPECTATION in a scalar model. While the correlational expectation is quite ubiquitous (most of us rely on prejudgment to some extent), the expectation can be easily betrayed. Life is far more complicated. To recycle the scenario about the German quiz, it is possible that Harry finally decided to work hard. Needless to say, we cannot expect others to have done better than expected in this case. In other words, we can expect the correlational expectation to be preserved only when a factor affects everyone equally, such as the quiz was easy. The above argument can be summarized below.

- (27) a. Harry did better than expected
 b. because there is a factor that affects everyone equally such as an easy quiz.
 OR
 c. because Harry did something unexpected that caused him perform better on the quiz (such as he prepared harder, he cheated, Martians kidnapped and transformed him into someone smarter overnight, etc.).

The above reasoning may be generalized as follows:

- (28) a. Something unexpected, event P, happened.
 b. Event P happened because there was a factor S that affected the event. The factor S equally affected other comparable events. (=The correlational expectation is preserved.)
 OR
 c. Event P happened because there was a factor T that affected the event. Factor T did not affect other comparable events. (=P is an OUTLIER.)

Even indicates that it is (28b), not (28c). Needless to say, the correlational expectation needs to be revised to accommodate the unexpected event described in the *even* sentence. The following conditions provide a general representation of the unexpectedness of an event or a state in a two-dimensional *even* sentence.⁷

- (29) Even (x_1, F_1)
 a. The speaker and the hearer share a pre-existing correlational expectation between the members of D_x and D_F , where D_x is a set of elements comparable to x_1 and D_F is a set of elements comparable to F_1 , and
 b. the truth value of the cell of $\langle x_1, F_1 \rangle$ is expected to be false according to the pre-existing correlational expectation.

The pre-existing correlational expectation should be revised to accommodate the newly introduced information. However, the relative correlational expectation should not be revised. (see Figure 5.)

feet?" for example), the question may make sense since there are other conditions, the ground, the temperature, etc., that relatively equally influence jumping.

⁷ There is an *even* sentence in which the unexpectedness does not come from direct contravention, but indirect contravention, such as *Even* Portia got 5 when Portia is one of the most proficient and 5 is less than expected for her. Here, $\langle x_1, F_1 \rangle$ is not expected to be false according to the pre-existing correlational expectation, but its scalar implicature contravenes the pre-existing correlational expectation. For further discussion on this, see Shudo (1998, 2002).

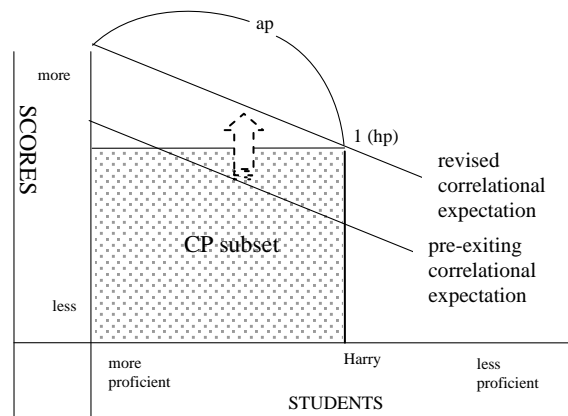


Figure 5

This point can be represented as follows:

(30) Even $\langle x_1, F_1 \rangle$

- a. The relative correlational expectation between the members of D_x and D_F is maintained, and
- b. the pre-existing correlational expectation is revised (shifted vertically, without changing the slope) to comply with the truth value of the cell of $\langle x_1, F_1 \rangle$

Now let us observe the following sentences in English, Japanese, and Korean, that present a proposition truth-conditionally identical to the *even* sentences but are not accompanied by a scalar operator.

(31) a. Harry got seven right answers.

b. Harry wa nana-mon seikai datt-a.
 TOP seven-questions right-answers COP-PAST
 ‘Harry got seven right answers.’

c. Harry-un ilgob-gae majasseo-yo.
 -TOP seven-questions got-right-PAST
 ‘Harry got seven right answers.’

When the context is such that seven correct answers are more than expected of Harry’s score, all of (31) should entail that *Harry did better than expected* (=25). In other words, without the presence of *even*, the unexpectedness should be recognized by the hearer anyway. On the other hand, neither of (24) seems to implicate that *students more proficient than Harry did better than expected* (=22). Thus, it seems fair to assume that when an unexpected event happens, unless it is marked with a scalar operator, the unexpected event is usually interpreted as an outlier. It should be noted that the presence of *even* semantically indicates what is represented in (29a)-(29b) and (30a)-(30b) while the absence of *even* pragmatically signals that the speaker’s intention is most likely not the scalar interpretation. *Even* interacts with the Maxim of Relevance, which tells us to optimize the implicature so that the correlational expectation in the scalar model survives.

4.4 Correlational expectation as a contextual constraint

Now we are ready to go back to the problem that I mentioned in the beginning: Why is (3b), repeated below, inappropriate when (4d) is appropriate?

(3) a. A: Hi. How did Harry do on the quiz?

- b. B: #Even he got seven right answers.
- (4) a. A: Hi. How was the quiz?
 b. B: Everyone did very well.
 c. A: How did Harry do?
 d. B: Even he got seven right answers.

Although the context provided for (3) clearly shows that the hp of (3b) has a contextual effect by answering A's question, the presence of *even* makes the sentence pragmatically inappropriate. There seems to be a constraint that the contextual effect of an *even* sentence should not be obtained by the hp itself. Since *even* sentences necessarily require accommodation for presupposition, just like *mo/to* sentences with scalar readings, the contextual effect of an *even* sentence should be obtained through the interaction between the implicated ap and H(x). The problem of (3b) is that, while *even* indicates the contextual effect should be obtained through the interaction between the ap and H(x), (3a) forces the contextual effect of the answer sentence to be obtained by the hp alone.

On the other hand, (4d) can contribute to the contextual effect that has already been pointed out in (4b) by strengthening it. In other words, (4d) is doing two things. It answers B's question by offering the hp. It also provides a piece of information that strengthens the contextual implication that (4b) has already produced. (4b) interacts with (32a) below that is expected to be present in the prior context to contextually imply (32b).

- (32) a. If everyone does well on a quiz, the quiz is probably easy.
 b. The quiz was probably easy.

It should be noted that (32b) is precisely what causes the revision of pre-existing correlational expectation since everyone's score is inflated because of the easy quiz.

5. Conclusion

While sentences containing *even*, as well as Japanese scalar *mo* and Korean scalar *to*, express some unexpectedness, the lexical items mark that the state or event describe in the hp is not an outlier in terms of the scalar expectations. Therefore, the correlational expectation is conserved, although the y-intercept has changed because of the unexpectedness. The usage of *even* interacts with correlational expectation in the scalar model and signals that the relative correlational expectation is conserved in order to accommodate the presupposition.

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