Decomposing Permission and Obligation: Evidence from Korean

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1 Introduction

- Two ways of studying modals:
  (i) Given a black box (i.e., modal auxiliary), study its property from the outside.
  ex) capture the entailment relations between black boxes, place it in an environment where some interesting properties can be attested, …
  (ii) Break it down and see whether there is any interesting fragment.
  ☞ This paper.

- This paper shows that…
  (i) If you break down the black box in the right way, each fragment remains meaningful.
  (ii) If we reassemble the fragments, thanks to the principle of compositionality, we can better understand what the black box does (means) as a whole.
  (iii) The way in which modal expressions are constructed in Korean (and Japanese) resembles how deontic reduction (Anderson 1956, Kanger 1957, von Wright 1968) is formulated.

- In Korean and Japanese, deontic modal expressions can be broken down to smaller pieces: a pair of conditional morpheme and a (set of) special morpheme constitute what has been called a 'modal auxiliary' (Wymann 1996 and Ammann and van der Auwera 2002 for Korean, Clancy 1985 and Akatsuka 1992 for Japanese).

- This paper will focus on Korean data, but the analysis can basically be carried over to Japanese (with additional assumption).

- Some Korean examples:
  (i) Obligation: *-(e)ya* 'only if' + *toy* (IPA [twe])
  (ii) Permission: *-(e)to* 'even if' + *toy*

(1) *Obligation* in Korean

John-un	maykcwu-lul	masi-**eya**	**toy**-n-ta.
John-TOP	beer-ACC	drink-**only if**	**TOY**-PRES-DECL

'John must drink beer.'
(Lit.) 'Only if John drinks beer, OK.'

(2) *Permission* in Korean

John-un	maykcwu-lul	masi-**eto**	**toy**-n-ta.
John-TOP	beer-ACC	drink-**even if**	**TOY**-PRES-DECL

'John may drink beer.'
(Lit.) 'Even if John drinks beer, OK.'

- The use of the two conditional morphemes are not exclusive to the deontic domain but are also utilized to express the meaning of conditionals in general.

(3)

pap-ul	cal	mek-**eya**	khi-ka	ku-n-ta.
rice-ACC	well	eat-**only if**	height-NOM	grow-PRES-DECL

'Only if one eats well, he/she grows tall.'

(4)

John-i	mayil	swul-ul	masi-**eto**	Mary-nun	hayngpokha-ø-ta.
John-NOM	every.day	alcohol-ACC	drink-**even if**	Mary-TOP	happy-PRES-DECL

'Even if John drinks every day, Mary is happy.'

- The significance of the provided data lies in that they let us probe deeper into the "interior" of deontic modal expressions.

- In many languages, deontic modality is conveyed by an auxiliary or an adverbial (e.g., English), so it cannot be further decomposed. Perhaps for this reason, the Kratzerian tradion of modality treated deontic modal auxiliaries as an atomic element.

- However, in Korean (and Japanese), there is morphological evidence that modal expressions consist of more primitive elements, one of which is a conditional and the other is *toy*.

- The question is whether the compositional semantics of these primitive elements is compatible with the preexisting analysis of deontic modality.

- Roadmap
  - (i) Briefly introduce Kratzer's (1977, 1981, 1991) analysis of modals
  - (ii) Introduce deontic reduction and why it's relevant to Korean
  - (iii) Proposal
  - (iv) Show that the compositional semantics of Korean obligation is compatible with the Kratzerian view of obligation.
  - (v) …but the Korean permission example does not correspond to modal possibility.
  - (vi) Provide the analysis of the Korean permission in terms of consequent-entailment.
  - (vii) Show where the proposed fits into the literature.

2 Background: the Kratzerian view of modality

- The standard analysis of modals (Kratzer 1977)
  (i) Conversational backgrounds uniquely determine the accessibility relation that maps a given world to modal domains (epistemic, deontic, circumstantial, …).
  (ii) Permission asserts the existence of an accessible world in which a proposition under evaluation is true.
  (iii) Obligation asserts that the proposition is true in all accessible worlds.

(5) Standard analysis of modality
$[\![\text{must}]\!]^{w,f} = \lambda q_{<s,t>}.\ \forall w' \in \cap f(w)\text{: } q(w') = 1$
$[\![\text{may}]\!]^{w,f} = \lambda q_{<s,t>}.\ \exists w' \in \cap f(w)\text{: } q(w') = 1$
where f is a conversational background

- The double relativity of modals (Kratzer 1981, 1991)
  (i) The problem of inconsistency
  Whenever a conversational background consists of propositions that are inconsistent, the conjunction of those propositions results in an empty set. Consequently, the following two sentences will both be vacuously true; they quantify over an empty set.

(6) a. Murder is necessarily a crime.
b. Murder is necessarily not a crime.

On the other hand, every sentence that expresses deontic possibility will be false because any proposition conjoined with an empty set (i.e., the conjunction of all members of the inconsistent conversational background) is an empty set.

(ii) The Samaritan Paradox
Suppose that a law is given such that (i) no murder occurs and (ii) if a murder occurs, the murderer will go to jail. Under this condition, the following examples in (7) are all true.

(7) It is necessary that
a. if a murder occurs, the murderers will go to jail.
b. if a murder occurs, the murderers will be knighted.
c. if a murder occurs, the murderers will be given $100.
d. if a murder occurs, the murderers will be fined $100.

This is because in every world where all of the given laws are true, there is no murder. Therefore, the conditionals in (7) are vacuously true.

(iii) Solution

Kratzer avoids the aforementioned issues by importing two conversational backgrounds, a *modal base* and an *ordering source*. The modal base supplies a set of relevant worlds, and the ordering source orders those worlds with respect to a given set of propositions.

(8) Partial ordering with respect to an ordering source

The ordering $\leq_{g(w)}$:

For all w, w′ ∈ W, for any $A \subseteq \wp(W)$: $w \leq_A w'$

iff $\{p: p \in A \text{ and } w' \in p\} \subseteq \{p: p \in A \text{ and } w \in p\}$ [Kratzer 1991: 644]

(9) Modal necessity (Kratzer 1991)

A proposition *p* is a **necessity** in a world *w* with respect to a modal base *f* and an ordering source *g* iff the following condition is satisfied:

For all $u \in f(w)$ there is a $v \in f(w)$ such that $v \leq_{g(w)} u$ and for all $z \in f(w)$:

if $z \leq_{g(w)} v$, then $z \in p$.

"For every sequence of relevant worlds ordered by the ordering source, there is a point at which the proposition *p* is true in all of the better worlds."

※ An alternative way to formulate the notion of necessity **(adopted in this paper)**

Portner (2009) introduces a *BEST* operator, which takes the modal base and the ordering source and returns a set of best worlds. Given the notion of best worlds, modal necessity means that a proposition is true in all of those best worlds.

(10) English deontic *must* reformulated with Portner's (2009) *BEST* operator

$[\![\text{must}]\!]^{w,f,g} = \lambda q_{<st>} .\forall w' \in \textbf{BEST}(\cap \textbf{f(w)})(\textbf{g(w)})$: q(w') = 1,

where f is a circumstantial modal base and g is a deontic ordering source

- The best operator is particularly useful in severing the concept of best worlds from the rest of the (Kratzerian) modal meaning.

- What this paper attempts to do:

  Decompose modal expressions into

  (i) a component that stands for the best worlds (δ)

  (ii) conditionals that relate those best worlds to a proposition.

- In Kratzer's original formulation, drawing a line between the two is rather difficult, if not impossible.

3 Deontic reduction

- Deontic reduction is an attempt to reduce and simplify the axioms of deontic logic.

- It introduces a single propositional constant δ, which has previously been glossed as 'the good thing', 'all obligations are fulfilled' (Lokhorst 2006), or 'OK' (Asher and Bonevac 2005).

- In deontic reduction, obligation is formulated as follows:[1]

(11) *Obligation* in deontic reduction
$\mathrm{OB}\ A =_{\mathrm{def}} \Box(\delta \rightarrow A)$ 'It is obligatory that A'

- Two notions of permission in deontic reduction:
  (i) Weak permission: Dual of obligation (modal possibility)
  (ii) Strong permission: To assert that an act is "explicitly" okay. Intuitively, "it is OK if A"

(12) *Permission* in deontic reduction
$\mathrm{PE}_{\mathrm{weak}}\ A =_{\mathrm{def}} \Diamond(\delta \wedge A)$ 'It is weakly permitted that A'
$\mathrm{PE}_{\mathrm{str}}\ A =_{\mathrm{def}} \Box(A \rightarrow \delta)$ 'It is strongly permitted that A'

- Implication of strong permission
  (i) Strong permission as free choice permission (Asher and Bonevac 2005).
  (ii) Absence of prohibition does not guarantee permission.
    ☞ Calls for an articulated system which allows a "deontic gap", where things can be neither permitted nor forbidden.

"There are, moreover, systems of normative relationship in which the principle that anything which is not forbidden is permitted may appear unreasonable. The relations between parents and their children (before a certain age) might serve as example. There are things which have never been prohibited to the child — but for the doing of which the child may yet be reprimanded or punished. It must not do these things without first, as we say, having asked permission. The parents will then consider which "deontic status" these actions should have."

[von Wright 1983: 137]

[1] There have been many suggestions as to how the conditional should be analyzed: strict implication, relevant implication, strict relevant implication, linear implication, and so on. For simplicity, I will treat it as strict implication, but the analysis proposed in this paper does not rely on this specific view of conditionals.

- Although the development of deontic reduction has been fruitful, what has not been extensively studied is how the aforementioned articulated system relates to possible world semantics.

- It has not been thoroughly discussed how to analyze δ in possible world semantics,[2] and what it means to explicitly permit something within the framework.

- Barker (2010) makes an insightful observation that the naturalness of deontic reduction receives empirical support from Japanese modal expressions, which involve conditionals.

- The fact that conditional constructions are exploited in expressing permission and obligation hints that deontic reduction, which also makes use of conditionals, may be the correct way to characterize permission and obligation of natural language.

4 Main hypothesis

"Korean *toy* corresponds to δ in deontic reduction."

- The choice to link Korean *toy* and δ is not entirely arbitrary. Recall that δ was read as something good, all obligations being fulfilled, or OK.

- In traditional Korean grammar, *toy* has the meaning of an inchoative. Although it is not intuitively clear how an inchoative relates to permission and obligation,[3] we can look at other lexical items that are interchangeable with *toy*.

- Ammann and van der Auwera (2002) mention two of them: *coh* 'good' and *kwaynchanh* 'okay'. Both morphemes are conceptually close to δ in that they can express one's ideal and rules.

(13) a. John-un maykcwu-lul masi-eto **coh**-n-ta.
John-TOP beer-ACC drink-even if **good**-PRES-DECL
'John may drink beer.'
(Lit.) 'Even if John drinks a bottle of beer, it is good.'

[2] To my knowledge, Barker (2010) is the only one who commented on the relation between deontic reduction and possible world semantics. He suggested that δ in deontic reduction corresponds to Kratzer's (1981, 1991) deontic ordering source.

[3] But see Barker (2012) for a view that performing an action triggers transition of states, and what strong permission asserts is that performing an action results in an OK state which can be equated with δ in this paper. If an inchoative signifies a change of state, we have a connection between the inchoative and δ.

b. John-un maykcwu-lul masi-eto **kwaynchanh**-ø-ta.
John-TOP beer-ACC drink-even if **okay**-PRES-DECL
'John may drink beer.'
(Lit.) 'Even if John drinks beer, it is okay.'

- Having established that *toy* signifies *δ*, I suggest the following semantics for *δ*. Intuitively, *δ* corresponds to a set of best worlds, given the modal base and the ordering source.

(14) Definition of *δ*
$[\![\delta]\!]^{w,f,g} =_{def} \text{BEST}(\cap f(w))(g(w))$,
where f is a circumstantial modal base and g is a deontic ordering source

- Recall that in Korean, deontic modality is conveyed by means of a conditional construction and utilization of *toy* '*δ*'. The proposed analysis suggests that there is a division of labor between accessing the ideal worlds (δ) and linking those worlds with a proposition (conditionals).

- In the following sections, the meaning of permission and obligation will be derived from the compositional semantics of *toy* '*δ*' and the conditional morphemes.

5 Deriving obligation

- Three parts of Korean deontic modal expressions
  (i) conditional morpheme (e.g., *if, even if, only if*)
  (ii) proposition under evaluation
  (iii) *toy* '*δ*'

- Keeping (ii) and (iii) constant, the choice of the conditional morpheme determines whether a sentence is interpreted as permission, obligation, or something else.

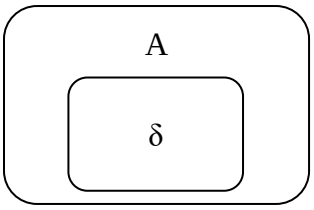
- Korean obligation employs an *only if* conditional as shown in (15).
  Antecedent: proposition under evaluation "John drinks beer"
  Consequent: *toy* '*δ*'

(15) *Obligation* in Korean
John-un maykcwu-lul masi-**eya** toy-n-ta.
John-TOP beer-ACC drink-**only if** TOY-PRES-DECL
'John must drink beer.'
(Lit.) 'Only if John drinks beer, it is OK.'

(16) a. **Obligation**

Only if A, δ: 'It is obligatory that A.'

b.



- Simplifications
  - (i) Omit the interpretation of tense
  - (ii) Conditionals are strict implications
    - ☞ Overly simplified. What must eventually be supplied is an elaborate theory of natural language conditionals, but it suffices for expository purposes.

- Assumptions
  - (i) English *if* and Korean *-myeon* 'if' have the same semantics.
  - (ii) Korean *-(e)ya* 'only if' is not decomposed into *only* and *if* (in fact, it is monomorphemic so no morphological evidence). It will be treated as a converse of an *if* conditional.

(17) Strict conditional *if*[4]

$[\![\text{-myeon}]\!]^{w,f,g} = [\![\text{if}]\!]^{w,f,g} =_{def} \lambda p_{<s,t>}\lambda q_{<s,t>}.\ \forall w'\text{: } p(w') = 1 \rightarrow q(w') = 1$

(18) $[\![\text{-(e)ya}]\!]^{w,f,g} =_{def} \lambda p_{<s,t>}\lambda q_{<s,t>}.\ \forall w'\text{: } q(w') = 1 \rightarrow p(w') = 1$

- The obligation example in (15) is analyzed as follows:

(19) a. $[\![(15)]\!] = [\![\text{-(e)ya}]\!]^{w,f,g}([\![\text{John drink beer}]\!]^{w,f,g})([\![\text{toy}]\!]^{w,f,g})$

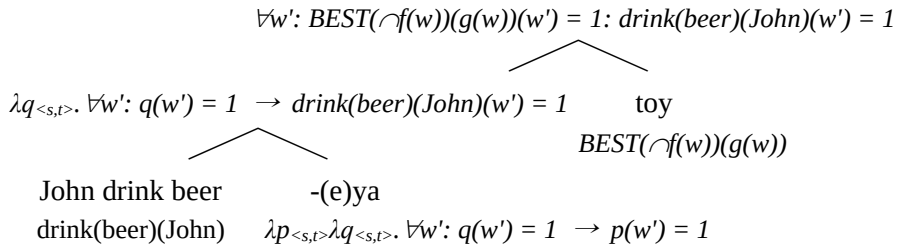
$= [\![\text{-(e)ya}]\!]^{w,f,g}([\![\text{John drink beer}]\!]^{w,f,g})([\![\delta]\!]^{w,f,g})$

$= (\lambda p_{<s,t>}\lambda q_{<s,t>}.\ \forall w'\text{: } q(w') = 1 \rightarrow p(w') = 1)\ ([\![\text{John drink beer}]\!]^{w,f,g})([\![\delta]\!]^{w,f,g})$

$= \forall w'\text{: } \text{BEST}(\cap f(w))(g(w))(w') = 1 \rightarrow \text{drink(John)(beer)}(w') = 1$

[4] When interpreted with respect to a model, strict implication quantifies over a specific set of worlds that are given in the model. Those set of worlds are called 'accessible' worlds. An accessibility relation, which is part of the model, defines which worlds are accessible and which worlds are not from a given world (see Portner 2009 for an introduction to modal logic which presents an analogy between ant-cognition and the accessibility relation). However in presentation of strict implication, I will not include the accessibility relation for simplicity.

b.



- The Kratzerian view of modality, with an additional utilization of Portner's (2009) *BEST* operator, produces the same result (cf. (10)).

- Since *BEST(∩f(w))(g(w))* is a set of worlds, it would be no harm to interpret it as a function from worlds to truth values. Thus, the two formulae *BEST(∩f(w))(g(w))(w') = 1* and *w' ∈ BEST(∩f(w))(g(w))* are interchangeable.

- The comparison with the standard view of obligation in the linguistic literature shows that the proposed analysis is on the right track.

- It remains to see whether the compositional semantics of *toy* '*δ*' and the *even if* conditional successively derives the meaning of permission.

6 Understanding permission

- Korean permission typically involves an *even if* conditional.

(20) *Permission* in Korean

John-un	maykcwu-lul	masi-**eto**	toy-n-ta.
John-TOP	beer-ACC	drink-**even if**	TOY-PRES-DECL

'John may drink beer.'
(Lit.) 'Even if John drinks beer, it is OK.'

- Can the above example, involving an *even if* conditional, be interpreted as modal possibility? That is, does it assert the existence of a deontically accessible world in which the given proposition is true?
  ☞ No evidence of existential quantification!

- Let's not make assumptions and just compositionally build up the semantics.

- Ingredients:
  (i) The proposition under evaluation, (ii) the *even if* conditional, and (iii) *toy* '*δ*'.

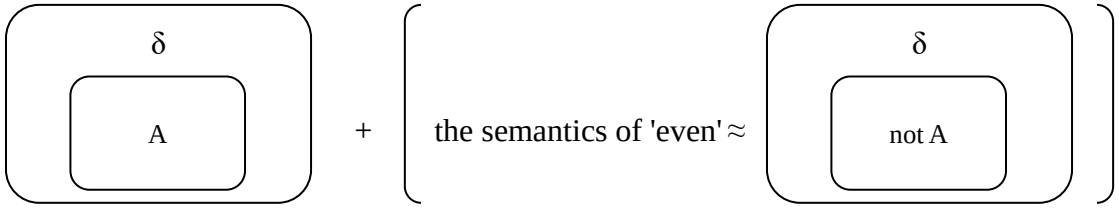
- What plays a crucial role in the analysis is the consequent-entailment property of *even if*, which has been discussed by a number of scholars (Bennett 1982, Guerzoni and Lim 2007).

- It will be shown that (20) has an interpretation analogous to unconditionals (Rawlins 2008), hence roughly comparable to "whether or not John drinks beer, it is OK". The OK state (δ) is achieved irrespectively of John drinking beer.
  ☞ "Explicitly" granting permission! Does not mean lack of prohibition.

- *Permissive optionality*
  Due to the optional status of an act (e.g., John's drinking beer is optional with respect to *δ* in (20)), I give the name *permissive optionality* to represent expressions of permission that are of the form 'even if A, δ'.

(21) a. **Permissive optionality**
Even if A, δ: 'It is permitted that A.'

b.



Assertion Presupposition

6.1 The consequent-entailment property of *even if*

- The consequent-entailment property of *even if* refers to a phenomenon where an *even if* conditional implies the truth of its consequent.

(22) Even if the bridge were standing, I wouldn't cross the river. (Introduced-if)

- In this example, the speaker implies that he would not cross the river. It does not matter whether the bridge is standing or not; the consequent 'I wouldn't cross the river' is true.

- On the other hand, there are cases where the *even if* conditional does not guarantee the truth of its consequent. Consider the following example in (23). The second sentence does not imply that the Mary will be happy no matter what. The consequent 'she will be happy' is not entailed.

- This interpretation is especially salient when *one kind word* is modified by *just* or it is focused to manifest that saying one kind word is a small act.

(23) Context: Mary is a very lonely person.
If you invite Mary to dinner, she will be happy.
Even if you say (just) [$_F$ one kind word], she will be happy. (Standing-if)

- Bennett (1982) groups *even if* into two varieties:
  (i) introduced-if: the consequent is entailed
  (ii) standing-if: the consequent is not entailed.

6.2 Guerzoni and Lim (2007) on the consequent-entailment property of *even if*

- Guerzoni and Lim (2007) divide *even if* into two components: *even* and *if*

- *Even* quantifies over a contextually salient subset of the asserted proposition's possible alternatives (Horn 1969, Karttunen and Peters 1979).

- Two presuppositions are introduced by *even*:
  (i) Additivity: one of the contextually salient alternatives is true.
  (ii) Scalarity: the asserted proposition is the least likely one to be true among the alternatives.

(24) a. ⟦even⟧(C)(p)(w) is defined iff the following two holds:

Additivity: $\exists q \in C\ [q \neq p \wedge q(w) = 1]$

Scalarity: $\forall q \in C\ [q \neq p \rightarrow p <_{\text{likely/expected}} q]$

b. If defined, then

Assertion: ⟦even⟧(C)(p)(w) = p(w)
where C is a contextually salient set of alternatives.

(25) Application of the proposed semantics of *even*
a. **Example**: Gil invited even [$_F$ Mac].
b. **Assertion**: Gil invited Mac
c. **Existential Presupposition (Additivity)**: Gil invited at least one contextually salient person other than Mac.
d. **Scalar presupposition**: Mac was the least likely (most noteworthy) person among the contextually salient people for Gil to invite.

- Guerzoni and Lim claim that the distinction of standing vs. introduced-if arises mainly due to the choice of the item which associates with *even*.

- In the case of introduced-if (consequent is entailed), *even* associates with verum focus (AFF).

- Verum focus generates a set containing only the following two alternatives:
  (i) the asserted proposition
  (ii) the asserted proposition's logical opposite

(26) Ordinary and focus semantic value of verum focus
$[\![\text{AFF}]\!]^o = \lambda t.t$
$[\![\text{AFF}]\!]^f = \{\lambda t.t, \lambda t.t = 0\}$

- When *even* associates with verum focus in the antecedent of an *even if* conditional, the two alternatives, which happen to be in the form of 'if *p*, *q*' and 'if not *p*, *q*', are both true.
  - ☞ The former is asserted, and the latter is presupposed by the additivity presupposition.
  - ☞ This leads to the truth of the consequent because whether or not the antecedent is true, the consequent will be true.

(27) Even if [$_F$ AFF] the bridge were standing, I wouldn't cross the river.

- On the other hand, the standing-if (consequent is not entailed) environment is created when *even* associates with something other than verum focus.

(28) Even if you say [$_F$ one kind word], Mary will be happy.

- In the above example, the focus semantic value is not a set which contains the asserted proposition and its negative alternative. Instead, we have for instance {If you say one kind word, Mary will be happy, If you give a present, Mary will be happy, ...}.
  - ☞ Despite the additivity presupposition, the logical space of the antecedent cannot be exhausted.
  - ☞ It may be the case that 'if you say one kind word, Mary will be happy' is asserted and 'if you give a present, Mary will be happy' is presupposed. But this is not sufficient to infer that 'Mary is happy' is true no matter what. Therefore, the consequent is not entailed.

6.3 Permissive optionality and the consequent-entailment property

- Recall that Korean permission expressions utilize *-(e)to* 'even if'.

- As with Guerzoni and Lim's introduced-if example, it is possible that the *even* component of *-(e)to* 'even if' associates with the covert AFF operator.

(29) *Permission* in Korean

John-un	maykcwu-lul	[$_F$ AFF]	masi-**eto**	toy-n-ta.
John-TOP	beer-ACC		drink-**even if**	TOY-PRES-DECL

'John may drink beer.'
(Lit.) 'Even if John drinks beer, it is OK.'

- In fact, we can add the logical opposite of the asserted proposition to the sentence as in (30). I assume that this sentence explicitly expresses the focus alternative created by the AFF operator.

(30)

John-un	maykcwu-lul	masi-eto	**an**	**masi-eto**	toy-n-ta.
John-TOP	beer-ACC	drink-even if	NEG	**drink-even if**	TOY-PRES-DECL

'Whether John drinks beer **or not**, it is OK.'

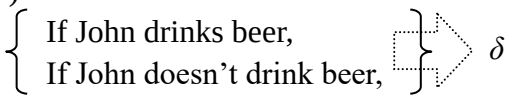
- Let's suppose that the *even* component of *-(e)to* 'even if' indeed associates with the covert AFF operator. We then have the following assertion and additivity presupposition:

(31) a. **Assertion**: If John drinks beer, δ.
b. **Additivity**: $\exists$ q$\in$C [q $\neq$ if John drinks beer, δ $\wedge$ q(w) = 1],
where C = {If John drinks beer, δ,
If John doesn't drink beer, δ}

- Only one alternative distinct from the asserted proposition:
'If John doesn't drink beer, δ'
☞ The additivity presupposition requires this to be true.

- Granted that both 'if John drinks beer, δ' and 'if John doesn't drink beer, δ' are true, the consequent 'δ' is true.
☞ The consequent δ is true irrespective of the truth of the antecedent.

(32)



6.4 Comparison with Rawlin (2008)’s unconditionals

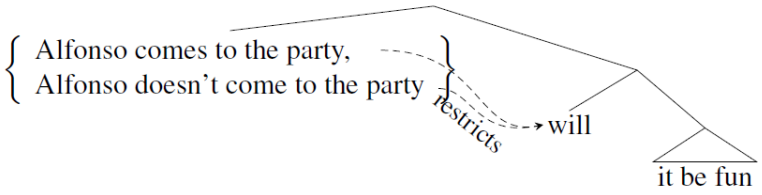
- Rawlins (2008) proposes that the *whether*-clause in (34a) provides two alternatives:
(i) Alfonso comes to the party
(ii) Alfonso doesn’t come to the party

- The alternatives point-wisely combine with the consequent to restrict the modal *will*.

- Consequently, the sentence asserts that it will be fun irrespective of Alfonso's presence.

(33) a. Whether Alfonso comes to the party or not, it will be fun.

b.



[Rawlins 2008: 584]

- Comparison with permissive optionality:
  (i) Both constructions convey that the consequent is true irrespective of the truth of the antecedent.
  (ii) It is the semantics of *toy* 'δ' in the consequent that makes permissive optionality special, turning a plain conditional into permission.
  (iii) There is another difference regarding how the truth of the consequent is implied. As for unconditionals, the two alternatives are asserted to be true. On the other hand, only one of the alternatives is asserted in permissive optionality, and the other alternative is presupposed.

6.5 Relevance to Barker's (2010) interpretation of strong permission

- Permissive optionality can be thought of as a variation or a subset of strong permission.

- What is especially relevant is Barker's (2010) interpretation of strong permission. He claims that strong permission is better understood when we consider the situations under which the strong permission formula will be true. The situations are divided into two, depending on whether "we are already in compliance" or not.

"But what exactly does A $\multimap \delta$[5][6] assert, if not that eating an apple will guarantee the good thing? The key is to consider when A $\multimap \delta$ will be true. We will be in a situation in which A $\multimap \delta$ just in case eating an apple in that situation is compatible ('cotenable' in the terminology of Relevant Logic) with all obligations being fulfilled. There are two kinds of such situations: situations in which eating an apple happens to be obligatory, in which case we can only conform to

[5] Barker uses the letter *A* to stand for eating an apple.
[6] The symbol $\multimap$ stands for linear implication in linear logic. Although there are more than a few differences between strict implication and linear implication (e.g., resource-sensitivity and absence of weakening), they do not affect the basic insight of strong permission.

obligations by eating the apple (after all, everything that is obligatory is at least permitted); and situations in which we're already in compliance, but eating an apple is optional and does not disturb our happy state." [Barker 2010: 10:12]

- According to Barker, if we are not already in compliance, an act happens to be obligatory. But if we are, the act happens to be optional with respect to being in compliance (δ).

- The latter situation is what permissive optionality can relate to. The additional *even* component of permissive optionality implies that δ is true, thus we are already in compliance.

- Therefore, it can be said that permissive optionality covers the latter half of the situations which makes the strong permission formula true.

7 Deontic suggestion: when performing a single act results in compliance

- The following example conveys that every John-drinking-beer world is a δ-world.

(34) John-un maykcwu-lul masi-**myeon** toy-n-ta.
John-TOP beer-ACC drink-**if** TOY-PRES-DECL
'If John drinks beer, it will be OK.'
☞ 'That John drinking beer results in compliance.'

- One of the situations where uttering (34) is appropriate is as follows:
Holmes and Watson were spying on a suspicious man in a bar. Watson got nervous and asked Holmes: "What should I do?" Then Holmes replies with (34) (with the subject 'John' substituted with a second person pronoun).
☞ If Watson drinks beer, he has done his part of the job and *will be in compliance*.

- I will use the term *deontic suggestion* to refer to expressions that are of the form 'if A, δ'.

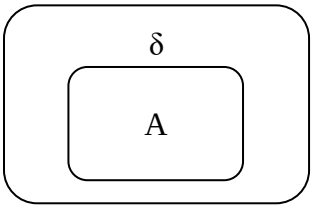
- These expressions do not grant permission or impose obligation, but suggests one way to be in compliance.

- In fact, in the above scenario, it is possible that Watson could have been in compliance by drinking wine. There is no obligation to drink beer, but if he decides to do so, performing this single act will result in compliance.

(35) a. **Deontic suggestion**

If A, δ: 'Performing A results in compliance.'

b.



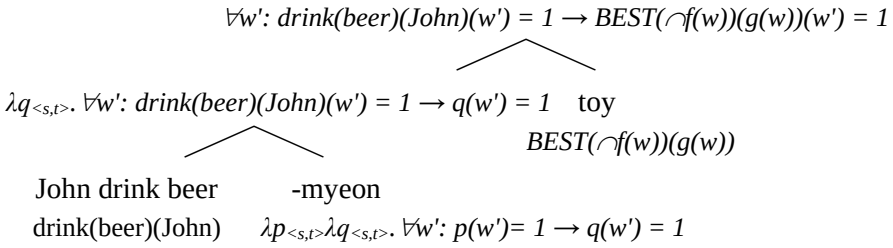
(36) a. $[\![(34)]\!]$ = $[\![\text{-myeon}]\!]^{w,f,g}([\![\text{John drink beer}]\!]^{w,f,g})([\![\text{toy}]\!]^{w,f,g})$

= $[\![\text{-myeon}]\!]^{w,f,g}([\![\text{John drink beer}]\!]^{w,f,g})([\![\delta]\!]^{w,f,g})$

= $(\lambda p_{<s,t>}\lambda q_{<s,t>}.\ \forall w'\text{: } p(w') = 1 \rightarrow q(w') = 1)\ ([\![\text{John drink beer}]\!]^{w,f,g})([\![\delta]\!]^{w,f,g})$

= $\forall w'\text{: drink(beer)(John)(w)} = 1 \rightarrow \text{BEST}(\cap f(w))(g(w))(w') = 1$

b.



8 Further prediction: from permission to suggestion

- The consequent-entailment property of *even if* plays an important role in conveying permission (with association with verum focus).

- It is natural to follow up with asking what will happen when the *even* component associates with something other than verum focus.

  ☞ No consequent entailment, hence no longer permission!

- In following example, where the sentence expressing deontic suggestion (if A, δ) is followed by the one corresponding to permissive optionality (even if A, δ).

(37) Shift of interpretation

John-un	maykcwu-lul	masi-**myeon**	toy-n-ta.	
John-TOP	beer-ACC	drink-**if**	TOY-PRES-DECL	
John-un	maykcwu-lul	[$_F$ han-pyeng]	masi-**eto**	toy-n-ta.
John-TOP	beer-ACC	one-CL	drink-**even if**	TOY-PRES-DECL

'If John drinks beer, it will be OK. Even if John drinks a bottle of beer, it will be OK.'

- The first sentence asserts that John drinking beer will result in compliance.

- The second sentence, although it is expressed in the form of permissive optionality, does not grant John permission to drink one bottle of beer. Instead, it asserts that if John drinks even a bottle of beer, he will result in compliance.

- Compare with the "granting permission" example below:

(38) John-un [$_F$ AFF] maykcwu-lul han-pyeng masi-**eto** toy-n-ta.
John-TOP beer-ACC one-CL drink-**even if** TOY-PRES-DECL
'John may drink a bottle of beer.'

- Analysis:
  The lack of permissive reading is due to the fact that the second sentence of (37) is in a *standing-if* environment where the consequent of the *even if* conditional is not entailed. As a consequence, the consequent δ is not implied and we no longer can relate it to the unconditional counterpart, "whether or not John drinks beer, δ".

- Compare with the following English example:

(39) If John drinks beer, the boss will fire him.
Even if he drinks [$_F$ a bottle] of beer, the boss will fire you.

- Similarly, in the Korean example in (37), the second sentence, which employs an *even if* conditional, is in a standing-if environment.

(40) a. **Example**: If drinks beer, δ. Even if John drinks [$_F$ a bottle] of beer, δ.
b. **Assertion**: If John drinks a bottle of beer, δ.
c. **Existential Presupposition (Additivity)**:
If John drinks at least one contextually salient amount of beer other than one bottle, δ.
d. **Scalar presupposition**:
One bottle is the least likely (most noteworthy) amount among the contextually salient amount of beer such that if John drinks the amount, δ.

- The semantics of *toy* 'δ', combined with the theory of conditionals and *even* suffice to provide a principled explanation for the apparent dynamic phenomenon.

9 Possibility modals in Korean

- Given a salient context, *toy* can signify an epistemic conversational background.

(41) *Epistemic necessity* in Korean (cf. (1))

nay-ka	a-nun	pa-ey	ttalumyeon	John-un	maykcwu-lul
I-NOM	know-REL	thing-to	according	John-TOP	beer-ACC
masi-eya	toy-n-ta.				
drink-only if	TOY-PRES-DECL				

'According to what I know, John must drink beer.'

- If the modal expression in the form "even if A, δ" (permissive optionality) were to correspond to modal possibility, we expect that the sentence can convey epistemic possibility.
  - ☞ The prediction is not borne out. The permission example in (2) does not have an epistemic interpretation.

(42) John might drink beer.

a. Epistemic possibility (dual of epistemic necessity):
   "There exists an epistemically accessible world in which John drinks beer."
b. Permissive optionality-like interpretation of epistemic modal?
   "Whether or not John drinks beer, he is in an epistemically accessible world (δ)."

- Korean has a separate strategy of expressing modal possibility. It utilizes a copula, thus explicitly marking existential quantification.

(43)

John-un	maykcwu-lul	masi-l	swu	iss-ø-ta.
John-TOP	beer-ACC	drink-REL	way	exist-PRES-DECL

(i) 'John might drink beer.' (epistemic)
(ii) 'John can drink beer.' (ability)
(iii) 'John may drink beer.' (weak permission?)
(Lit.) 'There exists a way for John to drink beer.'

- If the above sentence is modified by an adverbial phrase such as 'according to the law', the deontic interpretation is possible.

- Speculation:
  The morpheme *swu* 'way' can signify *δ*.

(44) $[\![\text{swu}]\!]^{w,f,g} =_{def} \text{BEST}(\cap f(w))(g(w))$,
where f is a modal base and g is an ordering source (flavor is determined by context)

(45) $[\![\text{iss}]\!]^{w,f} =_{def} \lambda p_{<s,t>}. \exists w: p(w)$

(46) $[\![(43)]\!] = [\![\text{iss}]\!]^{w,f,g}([\![\text{John-drink-beer}]\!]^{w,f,g} [\![\text{swu}]\!]^{w,f,g})$
$= [\![\text{iss}]\!]^{w,f,g} (\lambda w'. \text{drink(beer)(John)}(w') = 1 \wedge \text{BEST}(\cap f(w))(g(w))(w') = 1)$
$= \exists w': (\text{drink(beer)(John)}(w') = 1 \wedge \text{BEST}(\cap f(w))(g(w))(w') = 1)$

- Although the focus of this paper was on interpreting permissive optionality, it was by no means to deny that some natural language expressions are better understood as modal possibility.

- However, permission is special in that there is an "explicit" way to grant it, and it cannot be defined in terms of obligation.

10 Conclusion

- Korean *toy* corresponds to δ in deontic reduction.

- Under the assumption that *toy* 'δ' corresponds to a set of best worlds, the meaning of obligation can be compositionally derived.

- However, under the same assumption, the analysis of permission suggested that there is a distinctive way of explicitly granting permission.
- The view was bolstered by the fact that modal possibility in Korean is conveyed by means of an existential quantification.

- Permission is not on a par with other possibility modals and requires a special attention.

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