The local context of disjunction is not universal: A case study of Japanese[1]

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Abstract. Kurafuji (1998) observes that *bathroom anaphora* is felicitous in Japanese with an overt pronoun, but not with a covert 'pronoun.' This study reexamines this observation. I argue that the infelicity of the overt pronoun should be attributed to the absence of the local context for the second disjunct. I also demonstrate that the covert 'pronoun' is not a genuine instance of bathroom anaphora. The covert argument results from eliding an indefinite through *argument ellipsis*. The conclusion of this study implies that the local context of logical connectives is a locus of cross-linguistic/categorial variations.

Keywords: disjunction, bathroom anaphora, local contexts, Japanese

1. Introduction and summary

Bathroom anaphora, exemplified in (1), has been one of the central concerns of the dynamic analysis of anaphora resolution.[2]

(1) Either there is not a bathroom, or {**it / the bathroom**} is in a funny place.

The Japanese counterpart of the configuration is discussed by Kurafuji (1998). He observes that an overt pronoun *sore* '*it*' does not serve as bathroom anaphora.[3][4] The infelicity is replicated with a definite description *sono N* '*the N*.' The intended interpretation is obtained only with a null argument. (2) is a representative example.

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[2]The observation is attributed to Barbara Partee.

[3]Disjunction is most typically expressed as 'ϕ *ka* ψ' in Japanese. The second disjunct can optionally be followed by another occurrence of *ka*, as in 'ϕ *ka* ψ *ka* .' Clausal disjunctions become more natural when they are embedded. When embedded, the second occurrence of *ka* is obligatory.

[4]This judgment is challenged by Elbourne (2005), who claims that the degradation with *sore* disappears when the nominative marker *ga* is replaced with a topic-marker *wa*. I have two remarks on this observation. Firstly, the improvement with *wa* is not robust and is at least subject to inter-speaker variations. Secondly, the improvement is absent, at least to my ear, if a pronoun is not a subject. (i) sounds infelicitous regardless of the pronoun's case-/topic-marker or position.

(i) #[$_\phi$ *Kono tatemono-ni-wa toire-ga nai*] ***ka***, [$_\psi$ *(sore-wa/-o) hitobito-ga (sore-wa/-o)*
This building-DAT-TOP bathroom-NOM NEG or, *it*-TOP/-ACC people-NOM *sore*-TOP/-ACC
hen'na tokoro-ni tsukutta] *(ka dochiraka da).*
funny place-DAT made (or either TOP)
'(It's either) there is no bathroom or people made it in a funny place.'

(2) [$_{\phi}$ *Kono tatemono-ni-wa toire-ga nai*] ***ka,***
This building-DAT-TOP bathroom-NOM NEG or,

[$_{\psi}$ { ***#sono toire**-ga* / ***#sore**-ga* / *e* } *hen'na tokoro-ni aru*]
the bathroom-NOM it-NOM funny place-DAT exists

(*ka dochiraka da*).
or either COP

'(It's either) there is no bathroom, or the bathroom is in a funny place.'

Kurafuji discusses two theories of pronouns/definite descriptions: *dynamic semantics* (Heim 1982; Groenendijk and Stokhof 1991; Kamp and Reyle 1993; Groenendijk et al. 1996; a.m.o.) and the *E-type anaysis* (Cooper 1979; Heim 1990; Elbourne 2001; a.m.o.). The two analyses are not incompatible, and he assumes that the theory subsumes both. A version of dynamic semantics discussed by Kurafuji does not offer an analysis of bathroom anaphora. Kurafuji claims that the overt anaphora must be resolved dynamically. The infelicity of the overt pronoun in (2) is attributed to the inability of dynamic semantics to resolve it.

For Kurafuji, the null argument in (2) is a covert *pronoun*. He argues that the reference of the (alleged) covert pronoun can be resolved in a non-dynamic fashion: the covert pronoun is (optionally) subject to the *E*-type analysis.[5] Since the *E*-type analysis accounts for bathroom anaphora, according to Kurafuji, the covert pronoun is felicitous in (2).

Kurafuji's account for the infelicity of the overt pronoun depends on two assumptions:

- Overt pronouns must be dynamically resolved.
- Dynamic semantics is unable to resolve bathroom anaphora.

This study challenges the second assumption. (I also discuss the first assumption in section 4.1 to confirm it. I keep assuming it in the rest of the paper.) Bathroom anaphora is dynamically resolved as long as the theory satisfies the following two conditions.

- 'ϕ *or* ψ' is interpreted as '$\phi \vee (\neg\phi \wedge \psi)$', where $\neg\phi$ is the *local context* of ψ.
- Double Negation Elimination (DNE) is valid.

Frameworks that satisfy them have indeed been proposed (Krahmer and Muskens 1995; Elliot 2022; Aloni 2023). Given such frameworks, Kurafuji's explanation of the infelicity in (2) needs revision. Two logical possibilities suggest themselves:

- A Japanese disjunction 'ϕ *ka* ψ' is *not* interpreted as '$\phi \vee (\neg\phi \wedge \psi)$': the local context is absent.
- Double Negation Elimination (DNE) is *not* valid.

I contend that the first option is on the right track. The validity of the argument implies that local contexts in logical connectives are subject to cross-linguistic variations.

[5]Kurafuji commits to the *mixed-approach* to anaphora resolution (Chierchia 1995): the theory of anaphora resolution subsumes *both* the dynamic analysis and the *E*-type analysis. Although I do not intend to dispute the mixed approach, the following discussion reveals that the observation in (2) does not support it.

Without the local context, the *E*-type analysis also fails to account for bathroom anaphora. The felicity of the null argument in (2) must be reconsidered. I demonstrate that (2) with a covert argument is not a genuine instance of bathroom anaphora. The null argument is not a covert pronoun, and it results from eliding an indefinite instead.

The rest of this paper is organized as follows. Section 2 lays out necessary theoretical backgrounds. The way bathroom anaphora is resolved in dynamic semantics is discussed. Section 3 is devoted to justifying the lack of the local context in the Japanese disjunction. Section 4 confirms the assumption made in Kurafuji (1998) and in section 3. The claim that the null argument in (2) is *not* a pronoun is justified here as well. Section 5 discusses a remaining issue.

2. Theoretical backgrounds

Bathroom anaphora (1) has been taken as a challenge for dynamic semantics. The challenge is due to the environment of the apparent antecedent of the anaphora, *a bathroom*. It stays (i) within the scope of negation and (ii) in a different disjunct from the anaphora. (i) or (ii) alone makes anaphoric relation impossible, as shown in (3).

(3) a. #George doesn't own a car. It's blue.
b. #Either Jones owns a bicycle, or it's broken.

(Simons 1996: 245–246)

To overcome this challenge, Kamp and Reyle (1993) argues that the anaphora in (1) is not directly anteceded by the indefinite in the first disjunct; rather, it finds its antecedent in the *local context* (Stalnaker 1999; Karttunen 1974; Heim 1982) of the second disjunct, that is, he negation of the first disjunct.[6] The proponents of this analysis formalize the idea that disjunction $\phi \vee \psi$ is interpreted as $\phi \vee (\neg\phi \wedge \psi)$, where $\neg\phi$ is the local context. The equality $\phi \vee \psi \equiv \phi \vee (\neg\phi \wedge \psi)$ is classically valid, and the postulation of it is independently supported by various linguistic phenomena, as discussed in section 3 and section 5. Augmented with the local context, (1) is interpreted as (4a). (4a) is reduced to (4b), *if double negation in the $\neg\phi$-clause is eliminated*. The anaphora *the bathroom* is anteceded by an indefinite *a bathroom* in the $\neg\phi$ clause.

(4) a. Either [$_{\phi}$ there is not a bathroom], or
[[$_{\neg\phi}$ *it is not the case that there is not a bathroom*] and
[$_{\psi}$ the bathroom is in a weird place]].
b. Either [$_{\phi}$ there is not a bathroom], or
[[$_{\neg\phi}$ *there is a bathroom*] and [$_{\psi}$ the bathroom is in a weird place]].

The resolution of bathroom anaphora presumes two prerequisites:

- 'ϕ *or* ψ' is interpreted as 'ϕ *or* ($\neg\phi$ *and* ψ)', where $\neg\phi$ is the *local context* of ψ.
- Double Negation Elimination (DNE) is valid.

[6] See Hofmann (2022) for a different line of analysis. For Hofmann, negation is *externally dynamic*, and disjunction is *internally and externally dynamic*, in Groenendijk and Stokhof's (1991) sense. Accessibility is regulated by discourse coherency. The pronoun in (1) can be directly anteceded by the indefinite in the first disjunct, as long as the discourse is coherent.

As illustrated below, the local context is incorporated into the dynamic theory in, for example, Groenendijk et al. (1996). Validating DNE is not a trivial task, but Krahmer and Muskens (1995) proposes a way to do so. I discuss how the technicalities satisfy the prerequisites below.

2.1. Local context in Groenendijk et al. (1996)

The primary notions in Groenendijk et al.'s (1996) *Update Semantics* are *possibilities* and *states*.[7]

- Possibilities and States
  - A possibility i is a pair $\langle f, w\rangle$, w is a possible world, and f is an assignment function, a partial function from variables to individuals.
  - A state c is a set of possibilities i.
  - $i' = \langle f', w'\rangle$ is an extension of $i = \langle f, w\rangle$ iff $f \subseteq f'$ and $w = w'$
  - For $i = \langle f, w\rangle$ and $i' = \langle f', w'\rangle$, $i[x/d] = i'$ iff i' is an extension of i, $\texttt{Domain}(f') = \texttt{Domain}(f) \cup \{x\}$, and $f'(x) = d$.

Sentences update a state into a new state. Minimally, the update is defined as follows. Below, for any ϕ and ψ, $(c[\phi])[\psi]$ (the successive updates of c by ϕ and then by ψ) is abbreviated as $c[\phi][\psi]$.

- Updates
  - $c[Px_1,...,x_n] \coloneqq \{\langle w, f\rangle \in c \mid \langle f(x_1),...,f(x_n)\rangle \in f(P)\}$
  - $c[\exists xPx] \coloneqq \bigcup_{d\in D}(c[x/d][Px])$,
    where $c[x/d] \coloneqq \{i[x/d] : i \in c\}$
  - $s[\neg\phi] = \{i \in c \mid$ there is no j such that j is an extension of i and $j \in c[\phi]\ \}$
  - $c[\phi \vee \psi] \coloneqq c[\phi] \cup c[\neg\phi][\psi]$

$c[\exists xPx]$ is the update by sentences with an indefinite. It first updates each $\langle f, w\rangle \in c$ into $\langle f', w\rangle$ so that f' has x in its domain and $f'(x) = d$, for some $d \in D$; then eliminates the possibilities such that the individual $f'(x)$ is not P in w'; do this update for every $d \in D$; finally, collects the result. The resultant state only contains possibilities $i'' = \langle f'', w''\rangle$ such that $f''(x)$ is P in w''.

The local context of the disjunction is specified in the definition. The framework meets the first prerequisite for resolving bathroom anaphora. The second disjunct updates only the $\neg\phi$-possibilities. Consider the update by bathroom sentence, which I suppose is represented as (5a), B for being a bathroom, and W for being in a weird place. By the definition of updates by disjunction, (5a) is reduced to (5b), where the local context is made explicit. *If DNE were valid*, (5b) would further be reduced to (5c). $c[\exists xBx] = c'$ contains possibilities $\langle f, w\rangle$ such that x is in the domain of f and $f(x)$ is a bathroom. c' is update by Wx. The variable in Wx is resolved in all the possibilities in c' and is assigned to a bathroom, as desired.

[7]The system proposed by Groenendijk et al. (1996) is slightly more complicated than laid out here, due to *referent system*. Since the discussion below will not be affected, I will ignore it below.

(5) a. $c[\neg\exists x Bx \vee Wx]$
b. $c[\neg\exists x Bx] \cup c[\neg\neg\exists x Bx][Wx]$
c. $c[\neg\exists x Bx] \cup c[\exists x Bx][Wx]$

However, DNE is not valid in the definitions above. (5b) is *not* reduced to (5c), and bathroom anaphora is not resolved. To see this, consider the following model in (6) and the updates in (7) within this model.

(6) $W = \{w_1, w_2, w_3\}$, Jonathan runs in w_1, Mary runs in w_2, and no one runs in w_3. and a vacuous assignment function f. The initial set of possibility $c = \{\langle f, w_1\rangle_{i_1}, \langle f, w_2\rangle_{i_2}, \langle f, w_3\rangle_{i_3}\}$.

(7) a. $c[\exists x.\texttt{run}(x)] = \{\langle f_j, w_1\rangle, \langle f_m, w_2\rangle\}$
b. $c[\neg\exists x.\texttt{run}(x)] = \{\langle f, w_3\rangle\}$
c. $c[\neg\neg\exists x.\texttt{run}(x)] = \{\langle f, w_1\rangle, \langle f, w_2\rangle\}$
(f_j is an extension of f that assigns `jonathan` to x)

$c[\exists x.\texttt{run}(x)]$ eliminates the possibilities $\langle f, w\rangle \in c$ s.t. no one runs in $w \in i$, namely i_3; and f is updated so that the extended function assigns to x someone who runs, `mary` or `john`.

$c[\neg\exists x.\texttt{run}(x)]$ collects the possibilities $i \in c$ s.t. i cannot 'survive' the update by $[\exists x.\texttt{run}(x)]$, namely, i_3.

$c[\neg\neg\exists x.\texttt{run}(x)]$ collects the possibilities $i \in c$ s.t. i cannot 'survive' the update by $[\neg\exists x.\texttt{run}(x)]$, namely, i_1 and i_2.

Notice that (7c) eliminates $\langle f, w\rangle$ s.t. no one runs in w. In this sense, the double negation is eliminated in the *information-content* level – $[\neg\neg\exists x\phi x]$ keeps the worlds where $\exists x\phi x$ is classically true. I say DNE is *information-valid*, or ***i-valid***. However, the double negation is *not* eliminated for anaphoric resolution. By the definition of negation, $c[\neg\neg\exists x\phi x]$ is always a subset of c, and f in $i \in c$ is not extended. Suppose that the resultant state of the update in (7c) is further updated by $[\texttt{tired}(x)]$, as in (8). The variable x is unresolved because $f(x)$ is undefined. I say DNE is not *discourse-valid*, or not ***d-valid***.

(8) $c[\neg\neg\exists x\texttt{run}(x)][\texttt{tired}(x)]$

Consider (5) again. Suppose that no possibility in c has x in its domain. Then, Wx is not resolved. This is because of the inequality $[\neg\neg\exists x Bx] \neq [\exists x Bx]$. The former does not extend an assignment function, and x is not added to the domains of possibilities. Since DNE is not *d-valid*, the bathroom anaphora is not resolved. Conversely, suppose that every possibility in c has x in its domain. Then, the variable in Wx is resolved (assigned to some individual). However, nothing guarantees the intended meaning: $f(x)$ may well be a non-bathroom individual. Although the variable is resolved, the sentence does not obtain the intended reading.

Thus, the framework of Groenendijk et al. (1996) only meets the first prerequisite for resolving bathroom anaphora: it specifies the local context of disjunction, but it does not *d*-validate DNE.

2.2. *d*-validating DNE in dynamic semantics

Krahmer and Muskens (1995), being aware of the technical issue caused by DNE, propose a

way to *d*-validate DNE (see Elliot 2022 and Aloni 2023 for the same line of analysis). The proposal is to make the system bilateral. Their proposal is based on *Discourse Representation Theory* (DRT; Kamp 1981; Kamp and Reyle 1993; a.m.o.), but the gist can be incorporated into Update Semantics. In the bilateral Update Semantics, each expression ϕ is associated with the positive update $[\phi]^+$ and the negative update $[\phi]^-$ (cf. van den Berg 1996). For any ϕ except for $\neg\phi$, the positive update $[\phi]^+$ is equivalent to the updates defined in the previous section. The negative update is defined as follows.

- $c[\phi]^- \coloneqq \{i \in s \mid$ there is no j such that j is an extension of i and $j \in c[\phi]\}$

Crucially, negation is redefined as a flip-flop operator that switches between positive and negative updates.

- $c[\neg\phi]^+ \coloneqq c[\phi]^-$
- $c[\neg\phi]^- \coloneqq c[\phi]^+$

The redefinition lets DNE be ***i*-/*d***-valid, for:

(9) $c[\neg\neg\phi]^+ = c[\neg\phi]^- = c[\phi]^+$

Suppose that a positive update by disjunction is defined as[8]

- $s[\phi \vee \psi]^+ \coloneqq s[\phi]^+ \cup s[\neg\phi]^+[\psi]^+$

Then the variable in (5) is resolved. The bathroom sentence is translated into (10a), which is reduced to (10b). The negation in the local context is eliminated, adding x to the domain of possibilities. For any c, possibilities in $c[\exists xBx]^+ (= c')$ has x in its domain, and for any $\langle f, w\rangle \in c'$, $f(x)$ is a bathroom. Then $c'[Wx]$ contains possibilities where the bathroom is in a weird place, which is the intended reading.

(10) a. $c[\neg\exists xBx]^+ \cup c[\neg\neg\exists xBx]^+[Wx]^+$
b. $c[\neg\exists xBx]^+ \cup c[\exists xBx]^+[Wx]^+$

The bilateral system proposed by Krahmer and Muskens (1995) meets the two prerequisites below for resolving bathroom anaphora. It, in turn, reveals that bathroom anaphora can be dynamically resolved.

- 'ϕ *or* ψ' is interpreted as 'ϕ *or* ($\neg\phi$ *and* ψ)', where $\neg\phi$ is the *local context* of ψ.
- Double Negation Elimination (DNE) is valid.

3. 'ϕ *ka* ψ' lacks the local context

Recall that the infelicity of the overt pronoun in (2), repeated below, is attributed by Kurafuji (1998) to the inability of dynamic semantics to resolve bathroom anaphora.

[8]Here, the local context $[\neg\phi]^+$ is *conjoined* with $[\psi]^+$. Krahmer and Muskens (1995) proposes that the local context forms a conditional with the second disjunct: *if* $\neg\phi$, *then* ψ. See the paper for their motivation. Since the current discussion is agnostic to the issue, I keep using the conjunctive definition.

(2) [$_{\phi}$ *Kono tatemono-ni-wa toire-ga nai*] ***ka,***
This building-DAT-TOP bathroom-NOM NEG or,

[$_{\psi}$ { ***#sono toire**-ga* / ***#sore**-ga* / *e* } *hen'na tokoro-ni aru*]
the bathroom-NOM it-NOM funny place-DAT exists

(*ka dochiraka da*).
or either COP

'(It's either) there is no bathroom, or the bathroom is in a funny place.'

The discussion in section 2 reveals that the alleged inability is not supported. The infelicity of the overt pronoun does not follow immediately from Kurafji's assumption (on which this study is also based) that the overt pronoun must be dynamically resolved. Instead, the infelicity follows if one of the two prerequisites are not met, namely, if:

- A Japanese disjunction 'ϕ *ka* ψ' is *not* interpreted as '$\phi \vee (\neg\phi \wedge \psi)$': the local context is absent.
- Double Negation Elimination (DNE) is *not* valid.

I argue that the first option is on the right track. I argue that the Japanese disjunction ϕ *ka* ψ lacks the local context for the second disjunct.

That the second option is not promising is evident from (11). There, *sore* as well as *sono N* is resolved across double negation.[9] Recall Kurafji's assumption that *sore* must be dynamically resolved. Then, the anaphora in (11) reveals that DNE is ***d***-valid in Japanese as well. Otherwise, (11) would be infelicitous.

(11)

a. [[*kono tatemono-ni-wa toire-ga nai*] *wakedewanai*].
This building-DAT-TOP bathroom-NOM NEG it.is.not.the.case

{ ***Sono toire**-ga* / ***sore**-ga* } *hen'na tokoro-ni aru (dake da).*
The bathroom-NOM it-NOM weird place-DAT exists just COP

'It is not the case that there is no bathroom in this building. It's just that the bathroom is in a weird place.'

b. [[*kono ronbun-ni-wa mondai-ga nai*] *wakedewanai*].
this paper-DAT-TOP problem-NOM NEG it.is.not.the.case

Demo hissya-wa { ***sono mondai**-o* / ***sore**-o* } *mushi-siteiru yooda.*
But the.author-TOP the problem-ACC it-ACC ignore-do seems

'It is not the case that this paper does not have a problem. But it seems that the author ignores the problem.'

Given the ***d***-validity of DNE, if the local context for the second disjunct is present in 'ϕ *ka* ψ,' it would be wrongly predicted that the bathroom anaphora should be felicitous with *sono N* and *sore*. Thus, I argue that the local context is absent in the second disjunct in the first place. Technically, the update of state c by 'ϕ *ka* ψ', $c[\phi \text{ ka } \psi]$, is defined as follows. The definition does not posit the local context.

[9] See also Karttunen (1976) for the observation that anaphora is resolved across double negation.

- $c[\phi \vee \psi] \coloneqq c[\phi] \cup c[\psi]$

The bathroom sentence with the *ka*-disjunction, represented as (12a), is reduced to (12b). The variable in Wx is not resolved as bathroom anaphora.

(12) a. $c[\neg\exists x Bx \; ka \; Wx]$
b. $c[\neg\exists x Bx] \cup c[Wx]$

The argument that 'ϕ *ka* ψ' lacks the local context is supported by independent observations. In English, the local context is motivated by various phenomena. These phenomena are not replicated in Japanese.[10] I discuss two of them in this section. The first one is *polarity-reversed sluicing* (Kroll 2019). Consider the sluicing in (13).

(13) (Students were given the option to do an extra credit problem, but were required to mark which problem they did next to their name on a spreadsheet. There is no mark next to John's name. The TA says:)

'*Either* [$_\phi$ *John didn't do an extra credit problem*]*, or* [$_\psi$ *he didn't mark which one* ~~***he did***~~].'

(Kroll 2019:2)

Apparently, the antecedent of the sluicing is the ϕ-clause, '*John didn't do...*'. However, the ϕ-clause has the opposite polarity to the elided clause, and major theories of ellipsis do not predict the sluicing to be licensed. In the theory that requires syntactic isomorphism between an elided clause and its antecedent (e.g., Rooth 1992), the sluicing in (13) is not licensed because the negative particle *n't* makes the ϕ-clause syntactically non-isomorphic with the elided clause. In the theory that requires some form of uni- or bi-directional entailment between an elided clause and its antecedent (e.g., Merchant 1999), (13) is not licensed because in no way a proposition χ entails or is entailed by its negative counterpart, $\neg\chi$.[11]

Kroll argues that a suitable antecedent for the ellipsis is provided by the local context of the

[10]The only exception I'm aware of is *presupposition filtering*. I discuss it in section 5.

[11] The only theory I am aware of that licenses the sluicing in (13) is Rudin's (2019) head-based syntactic identity theory. It states that sluicing is licensed as long as the *eventive core* of an elided clause is identical to that of its antecedent. The eventive core of a clause is the *v*P projection and the constituents below it. Suppose that the negative particle in the ϕ-clause in (13) is located above *v*P. Then the eventive core of the ϕ-clause and the elided clause are identical, *modulo* conversions of the trace (see Rudin 2019 for the exact formulation). The sluicing is licensed without mentioning the local context. The discussion in the main text persists, however. Notice that Rudin's (2019) theory overgenerates impossible sluicings discussed in Kroll (2019), for example, (i).

(i) (Students in a semantics class were given a set of extra credit problems, which they could choose to do up to half of. All students were required to put a mark on a spreadsheet next to each question, indicating whether they did or didn't do it. The professor and TA look at the spreadsheet and see that John has not put a mark next to all of the questions. The TA says to the professor:)
John marked which problems he did, but he didn't mark which problems* ~~*he didn't do***~~

(Kroll 2019: 26)

Being aware of the overgeneration problem, Rudin (2019: 3.1.) claims that some pragmatic principle regulates the interpretation of sluiced clauses. That is, there should be some principle that licenses the intended interpretation in (13) but not in (i). We can then hypothesize that the pragmatic principle mentions entailment by a local context. That is, the interpretation in (13) is possible *because* it is entailed by the local context, and the one in (i) is impossible because there is no such local context. As long as some pragmatic principle is required to regulate the interpretation of sluiced clauses, the felicity of (13) with the interpretation motivates the local context.

second disjunct, $\neg\phi$. Via DNE, the local context is [$_{\neg\phi}$ *John did do an extra credit problem*]. The local context entails the elided clause, *modulo* focus closure (Merchant 1999).

If the local context is not present in the Japanese 'ϕ *ka* ψ,' the polarity-reversed sluicing in (13) should not be replicated there. This prediction is borne out. Even under the same context as (13), the Japanese counterpart of polarity-reversed ellipsis in (14) is infelicitous.[12]

(14) # [$_{\phi}$ *John-wa tsuika kadai-o yara-**nak**-atta*] ***ka**,*
John-TOP extra assignment-ACC do-NEG-PAST or

[$_{\psi}$ *dore-o*$_1$ [~~*kare-ga*~~ *t*$_1$ ~~*ya-tta*~~] *ka kiroku-si-nak-atta*] *(ka da).*
which-ACC he-NOM do-PAST Q record-do-NEG-PAST (or COP)

Intended: 'Either John didn't do an extra credit problem, or he didn't mark which one ~~**he did**~~.'

Note that this is not due to a language-specific ban on polarity-reversed ellipses.[13] Kroll (2019) claims that (15) is another instance of polarity-reversed ellipsis. The Japanese counterpart in (16) is also felicitous, as observed in Sato (2022).

(15) I don't think that [California will comply], but I don't know why [~~**California will not comply**~~].

(16) *Boku-wa* [*kotosizyuuni koronaka-ga syuusokusuru-to*]
I-TOP by.the.end.of.this.year coronavirus.crisis-NOM is.over-COMP
*omottei-**nai**-si,*
think-NEG-and

naze [~~***kotosizyuuni koronaka-ga syuusokusi-nai***~~] *ka-mo*
why by.the.end.of.this.year coronavirus.crisis-NOM is.over-NEG Q-also
aruteido kentoogatsuiteiru.
to.some.extent can.guess

'I don't think that the coronavirus crisis will be over by the end of this year, and I can kind of guess why ~~it will not be over by then~~.'

(Sato 2022:342)

The other motivation for the local context we discuss here is the domain restriction of a modal in the second disjunct (Klinedinst and Rothschild 2012; Rothschild 2013). In (17), the use of epistemic *must* does not entail that the speaker is sure that John is in the kitchen. Instead, it is interpreted as '*if John is not in the basement, he must be in the kitchen*.' The quantificational domain of the modal is restricted by the local context $\neg\phi$. Otherwise, the use of *must* would be pragmatically odd: if the speaker were certain that John is in the kitchen, there would be no reason to mention the possibility of John being in the basement.

[12]Sluicing in Japanese is notoriously complex. The issue is if the elided material in (14) (and in alleged sluicings in general) has a full clausal structure as specified there, or derived as a *pseudo-sluicing* (roughly:*which problem ~~is it~~*). Nevertheless, the literature seems to agree that the case marker in the remnant wh-phrase guarantees that the construction is an instance of genuine sluicing. See, for example, Takahashi (1994).

[13]One may argue, for instance, the infelicity of (14) is due to the negation in Japanese being located lower than in English (cf. Han et al. 2004). If so, Rudin's (2019) theory discussed in footnote 11 predicts the infelicity of the sluicing in (14). However, it undergenerates the sluicing in (16).

(17) Either [$_{\phi}$ John is in the basement], or [$_{\psi}$ he must be in the kitchen].
(Rothschild 2013:65)

The absence of the local context in 'ϕ *ka* ψ' should render the Japanese counterpart of (17) to be infelicitous. This prediction is also borne out. A modal in the second disjunct is never restricted by a local context. (18a) and (18b) sound pretty odd. The only interpretation available is that the speaker is certain that Taro is in the kitchen, eliminating the necessity of mentioning the first disjunct.

(18) a. #[$_{\phi}$ *Taroo-wa chika-ni iru*] *ka*
Taro-TOP basement-DAT present or
[$_{\psi}$ *Taroo-wa kicchin-ni iru* ***nichigainai***] .
Taro-TOP kitchen-DAT present must
'Either Taro is in the basement, or it must be the case that Taro is in the kitchen.'

b. #[$_{\phi}$ *Taroo-wa chika-ni iru*] *or*
Taro-TOP basement-DAT present or
[$_{\psi}$ *Taroo-wa* {***machigainaku*** / ***kakujitsuni***} *kicchin-ni iru*] .
Taro-TOP surely certainly kitchen-DAT present
'Taro is in the basement, or Taro is surely/certainly in the kitchen.'

The same observation is obtained with a non-epistemic modal.[14] The circumstantial modal in (19) cannot be interpreted as '*if Taro is not in the basement, it is highly likely....*' Instead, it is interpreted as Taro is highly likely to be in the kitchen, whether or not he is in the basement.

(19) [$_{\phi}$ *Taroo-wa chika-ni iru*] *ka*
Taro-TOP basement-DAT present or
[$_{\psi}$ *Taroo-wa kicchin-ni iru* ***kanousei-ga takai***]
Taro-TOP kitchen-DAT present possibility high
'Taro is in the basement, or it is highly likely that Taro is in the kitchen.'

The fact that the polarity reversed sluicing in (13) and the domain restriction in (17) are not replicated provides independent supports for the absence of the local context in 'ϕ *ka* ψ.' If this proposal is on the right track, it reveals a new locus of semantic cross-linguistic variations: the presence or absence of the local context in disjunction. It further implies that there might be a variation in other logical connectives. The 'dynamic properties' of logical connectives, observed for disjunction in (1), (13), and (17), are almost exclusively discussed with English examples. Whether or not these examples are replicated in other languages and theoretical implications of their replicability are rarely discussed. The observation in Japanese above reveals the necessity of more investigations in other languages.

[14] I owe Teru Mizuno (p.c.) for this observation.

4. Further discussion on (2)

4.1. *Sore*/*sono N* as strong definites

So far, we have followed Kurafuji (1998) and assumed that the overt pronoun *sore* '*it*' and the definite description *sono N* '*the N*' must be dynamically resolved. This section is devoted to justifying this assumption. I demonstrate that *sono N* is a *strong definite* in Schwarz's (2009) dichotomy.

In Schwarz's (2009) dichotomy, *strong definties* are definite expressions that must be resolved dynamically. They are translated into a variable, and the variable must be mapped to some individual in the domain by an assignment function.[15] On the other hand, *weak definites* are definite descriptions that denote a unique individual that meets a certain description in a given situation. In other words, weak definites function as stated by the *E*-type analysis (Cooper 1979; Heim 1990; Elbourne 2001; a.m.o.). For example, given assignment function g and situation s, the weak definite the_{wk} *bathroom* is interpreted as (20a), while the strong definite $the_{sk,x}$ *bathroom* as (20b).

(20) a. $[\![the_{wk}\ bathroom]\!]^{g,s} \rightsquigarrow$ the unique bathroom in s
b. $[\![the_{st,x}\ bathroom]\!]^{g,s} \rightsquigarrow g(x)$

The two types of definites are diagnosed with the following predictions.

- Weak definites can be used as long as a given situation guarantees uniqueness. They can be used without being anteceded by an indefinite.
- Strong definites must be anteceded by an indefinite. As long as there is an antecedent, a strong definite does not require uniqueness.

In a dialect of German investigated by Schwarz (2009), a non-contracted sequence of a preposition and a definite article is interpreted as a strong definite. In contrast, a contracted form is interpreted as a weak definite. The contrast is shown below.

(21) a. *Der Empfang wurde* { *vom* / *#von dem* } *Bürgermeister eröffnet.*
The reception was by.the$_{wk}$ by the$_{st}$ mayor opened
'The reception was opened by the mayor.'
b. *In der Kabinettsitzung heute wird ein neuer Vorschlag* { ***vom*** *Kanzler* / ***#vom*** *Minister* } *erwartet.*
in the cabinet.meeting today is a new proposal by.the$_{wk}$ chancellor by.the$_{wk}$ minister expected
'In the cabinet meeting today, a new proposal by the chancellor/minister is expected'
(Schwarz 2009:40–41)

In (21a), the weak definite is felicitous and preferred. The utterance is made in a situation where there is a unique mayor. In (21b), the weak definite is felicitous with *Kanzler* '*chancellor*,' but not with *Minister* '*minister*,' because the world knowledge tells that there is a unique chancellor but not a unique minister.

[15]The technicality in the following discussion is simplified somewhat. In Schwarz (2009), strong definites are compositionally derived from the semantics of weak definites.

Strong definites are felicitous in (22), where it is anteceded by an indefinite. The weak definite is not felicitous there, because of the non-uniqueness of *politicians/books*.[16]

(22) a. *Hans hat einen Schriftsteller und einen Politiker interviewt. Er hat*
Hans has a writer and a politician interviewed He has

{ ***vom*** / ***von dem*** } ***Politiker*** *keine interessanten Antworten bekommen*
from.the$_{wk}$ from the$_{st}$ politician no interesting answers gotten.

'Hans interviewed a writer and a politician. He didn't get any interesting answers from the politician.'

b. *In der New Yorker Bibliothek gibt es ein Buck ü Topinambur.*
In the New York library exists EXPL a book about topinambur
Neulich war ich dort und habe { ***#im*** / ***in dem*** } ***Buch*** *nach einer*
Recently was I there and have in.the$_{wk}$ in the$_{st}$ book for an
Antwort auf die Frage gesucht, ob man Topinambur grillen kann.
answer to the question searched whether one topinambur grill can.

'In the New York public library, there is a book about topinambur. Recently, I was there and searched in the book for an answer to the question of whether one can grill topinambur.'

(Schwarz 2009: 30)

Schwarz's (2009) paradigm provides independent support for the assumption that the definite expression *sono N* must be resolved dynamically. (23a) shows that *sono N* is not licensed solely by uniqueness. A bare noun must be used instead (Japanese bare nouns have both indefinite and weak-definite interpretations, among others.) (23b) shows that it is felicitous as long as it is anteceded by an indefinite, even when the uniqueness is not guaranteed.

(23) a. ***(#Sono)*** ***soori****-ga* *kisya kaiken-o* *sita.*
the prime.minister-NOM press conference-ACC did.
'The prime minister did a press conference.'

b. *Kinoo tosyokan-de omosiroi hon-o mitsuketa.* ***#(sono)*** ***hon****-wa*
yesterday library-in interesting book-ACC found. The book-TOP
seiseibunpou-ni hanron siteita.
generative.grammar-DAT argue.against did.
'I found an interesting book in the library yesterday. The book argues against the generative grammar'

The observation suggests that *sono N* in Japanese is a strong definite. From the morphological similarity, I conjecture that the overt pronoun *sore*, which shares the anaphoric *so* part (cf. Hoji 1995) with *sono N*, is also classified as a strong definite. Then the assumption made by Kurafuji

[16]The reason why the weak definite is infelicitous here becomes less clear when the situation-based definition of conjunction is considered. Suppose that the sequence of sentences in (22) is interpreted as a conjoined sentence. Then the second 'conjunct' could be interpreted w.r.t. a minimal situation where the first 'conjunct' is true, which indeed contains a unique politician (see the discussion in section 4.2). It becomes even more puzzling because weak definites do have co-variation use. Schwarz (2009) does point out cases where weak definites seem to pick up a referent from the previously established context. I leave this issue open here.

(1998) and in the above sections is supported: *sono N* and *sore* are strong definites and must be resolved dynamically.

4.2. A null 'pronoun'?

Kurafuji (1998) assumes the null argument *e* in the bathroom interpretation in (2) is a covert 'pronoun'. He claims that the alleged pronoun can be interpreted as an *E*-type pronoun, in other words, as a weak definite. In this section, I first demonstrate that a weak definite obtains the intended reading in bathroom sentences only if the local context for the second disjunct is present.[17] The absence of the local context in the Japanese 'ϕ *ka* ψ' predicts that the covert 'pronoun,' assumed to be a weak definite, does not work as a bathroom anaphora either. Then, the felicity of the covert argument in (2) does not follow from the assumption that it is a weak definite. I argue instead that covert argument in (2) does not form a genuine instance of bathroom anaphora. The covert argument is an elided *indefinite* rather than a definite.

Weak definites denote a unique individual that meets a certain description in *s*. Suppose that the covert 'pronoun' in (2) is interpreted as (24), a weak definite with the description *bathroom*.[18]

(24) $[\![\textit{the}_{wk}\ \textit{bathroom}]\!]^{g,s} \rightsquigarrow$ the unique bathroom in *s*

The uniqueness must be evaluated w.r.t. a sufficiently *minimal situation*. In (25), for example, $\textit{the}_{wk}$ *bathroom* is interpreted in a minimal situation where the first conjunct is true.

(25) There is a bathroom in this building and the$_{wk}$ bathroom is in a weird place.

To implement the idea, the conjunction in (25) should be interpreted as (26). $s' \leq s$ holds if *s* is an extension of s': every proposition true in s' is true in *s*. The weak definite is interpreted in situation s', a minimal situation containing a bathroom. Since it is minimal, s' contains only one bathroom. The unique bathroom in that situation is denoted by the weak definite.

(26) $[\![(25)]\!]^{g,s}$ = *true* iff There is a bathroom in *s* and *in some minimal situation* s' *such that* $s' \leq s$ *and there is a bathroom in* s', the unique bathroom in s' is in a weird place.

Applying the idea to disjunction, the bathroom sentence in (27) with a weak definite should be interpreted as (28). Notice that the italicized part carries the same function as the local context we have assumed for English disjunction. The second disjunct ψ in $\phi \vee \psi$ is evaluated w.r.t. some minimal situation where ϕ is *false*. Via DNE, such a minimal situation s' is a situation that contains one bathroom. This bathroom is denoted by the weak definite.

(27) Either there is not a bathroom, or the$_{wk}$ bathroom is in a weird place.

(28) $[\![(27)]\!]^{g,s}$ = *true* iff There is a bathroom in *s* or *in some minimal situation* s' *such that* $s' \leq s$ *and* ***it is not the case that*** *there is not a bathroom in* s', the unique bathroom in s' is in a weird place.

[17] To the best of my knowledge, however, the literature of *E*-type analysis does not discuss much how *and* and *or* are interpreted in the framework. The following discussion is based on the definitions laid out in Mandelkern and Rothschild (2019), although they point out conceptual and empirical problems of the *E*-type analysis.

[18] The discussion is based on the assumption made by the *E*-type analysis that pronouns are decomposed into a definite article and a description (Cooper 1979; Elbourne 2001).

The notion of the local context is crucial in obtaining the intended bathroom-sentence interpretation, even if the definite is weak. If Kurafuji (1998) is right in assuming that the covert argument in (2) is a weak definite, the current proposal is at odds with the felicity of the covert argument there. The absence of the local context should predict the weak definite to be infelicitous.

To resolve this conflict, I argue that the null argument is interpreted as an elided indefinite, derived via *argument ellipsis* (Oku 1999; Kim 1999; a.o.). The sentence is interpreted as (29). The subject undergoes an ellipsis anteceded by the indefinite in the first disjunct.[19]

(29) Either there is not a bathroom, or ~~a bathroom~~ is in a weird place.

When and how argument ellipsis is licensed is a complicated matter (see Sakamoto 2019; Fujiwara 2022 for discussions). Nevertheless, it is evident from (30) that an indefinite licenses argument ellipsis across negation (30a) and disjunction (30b). In these examples, the null argument *e* is interpreted as *a book*.

(30) a. *Taroo-wa hon-o kawa-nak-atta. Hanako-wa e kat-ta.*
Taro-TOP book-ACC buy-NEG-PAST Hanako-TOP buy-PAST
'Taro didn't buy a book. Hanako bought *e*.'

b. [$_{\phi}$ *Taroo-ga hon-o kau*] *ka,* [$_{\psi}$ *Hanako-ga e kau*] *ka (dochiraka da).*
Taro-TOP book-ACC buy or Hanako-NOM buy or either COP
'(It is either) Taro buys a book or Hanako buys *e*.'

Then, the null argument in (2) can also result from argument ellipsis. An important consequence of this claim is that the null argument in the bathroom configuration can be interpreted as an indefinite. That this prediction is borne out is evident from (31). The second disjunct ψ is interpreted as '*he recently raises* ***a pet*** *carefully*.' This interpretation cannot be derived by interpreting the null argument as a weak definite *the pet*, even if the local context is present there. The local context of the second disjunct would be [$_{\neg\phi}$ *Taro has let a pet die*]. The alleged weak definite would denote the pet that Taro has let die. But then the second disjunct states that Taro carefully raises the pet he has let die, which is not an available interpretation of the second disjunct. Thus, in (31), the null argument must be interpreted as an elided indefinite.

(31) (Checking his history with pets, there is no trait that shows Taro let his pet die in the past five years. The speaker concludes:)
[$_{\phi}$ *Taro-wa petto-o korosita koto-ga ichidomo nai*] *ka,* [$_{\psi}$ *saikin-wa e*
Taro-TOP pet-ACC killed experience-NOM once NEG or recently-TOP
taisetsu-ni sodateteiru] *(or dochirakda da)*
carefully raise or either COP
'Either Taro never let a pet die, or he recently raises *e* carefully.'

Given the availability of argument ellipsis, the felicity of (2) with a covert argument does not

[19] Another possible analysis is that the uniqueness is a pragmatic presupposition. As discussed in section 5, presuppositions in the Japanese disjunction are filtered in the same way as observed in English. It seems that the local context effect is present only for presupposition filtering. If the uniqueness is also a presupposition, as assumed in the *E*-type analysis literature, the felicity of the covert argument in (2) is expected as long as the covert argument is a weak definite. Nevertheless, note that the examples discussed below in the main text still suggest that the covert argument *can* be an elided indefinite.

necessarily suggest that the bathroom configuration is possible in Japanese. Instead, I conclude that (2) with a covert argument does not form a bathroom sentence in the first place – the covert argument results from eliding an indefinite, anteceded by the indefinite in the first disjunct. The apparent bathroom interpretation of (2) does not form evidence against the current claim that the Japanese disjunction 'ϕ *ka* ψ' lacks the local context.

5. A remaining issue

In this section, I discuss another motivation for the local context in disjunction: presupposition filtering. Karttunen (1973) observes presupposition p in 'ϕ *or* ψ_p' is filtered if $\neg\phi$ entails ψ.

(32) a. Either baldness is not hereditary or **all of Jack's children** are bald.
$\rightsquigarrow$ Jack has children.

b. Either Jack has no children or **all of Jack's children** are bald.
$\not\rightsquigarrow$ Jack has children.

(Karttunen 1973: 180)

An intuition agreed on among the literature of the projection problem of presuppositions (Stalnaker 1999; Karttunen 1974; Heim 1982; Beaver 2001; a.m.o.) is that a presupposition projects unless it is entailed by its local context. The fact that the presupposition disappears in (32b) is another motivation for positing the local context $\neg\phi$ for disjunction $\phi \vee \psi$.

If the Japanese disjunction 'ϕ *ka* ψ' lacks the local context, it is expected that the presuppositions of the disjuncts projects unconditionally. This prediction is *not* borne out. The presupposition of a second disjunct is filtered by the same condition we observed in (32) for English. The presupposition of ψ does not project if it is entailed by $\neg\phi$. (33) presupposes Taro used to smoke, but (34) doesn't.[20]

(33) [$_\phi$ *Taroo-wa okane-ga nai*] ***ka***, [$_\psi$ *tabako-o suu-no-o* ***yame-ta***] *(ka*
Taro-TOP money-NOM NEG or smoke-ACC smoke-NMNL-ACC stop-PAST or
dochiraka da).
either COP
'Either Taro has no money, or he stopped smoking.'
$\rightsquigarrow$ He used to smoke.

[20]The filtering effect is also symmetric, as confirmed by an experimental investigation by Kalomoiros and Schwarz (2021) for English. (i) does not presuppose that Taro used to smoke.

(i) [$_q$ *tabako-o suu-no-o* ***yame-ta***] ***ka***, [$_p$ *Taroo-wa tabako-o sutta-koto-ga*
smoke-ACC smoke-NMNL-ACC stop-PAST or Taro-TOP smoke-ACC smoke-experience-NOM
nai] *(ka dochiraka da).*
NEG or either COP
'Either he stopped smoking, or he never used to smoke.'
$\not\rightsquigarrow$ He used to smoke.

(34) (The speaker observes that Taro does not smoke now. He concludes:)
[$_{\phi}$ *Taroo-wa* *tabako-o* *sutta-koto-ga* *nai*] ***ka***, [$_{\psi}$ *tabako-o*
Taro-TOP smoke-ACC smoke-experience-NOM NEG or smoke-ACC
suu-no-o ***yame-ta***] *(ka dochiraka da).*
smoke-NMNL-ACC stop-PAST or either COP
'Either he has never smoked, or he stopped smoking.'
$\not\rightsquigarrow$ He used to smoke.

The observation is at odds with the claim that the Japanese 'ϕ *ka* ψ' lacks the local context.[21] Although I have to leave an investigation on a possible resolution of the conflict for future work, here is a possible direction. Stalnaker (1999) pursues the idea that presupposition projection is a pragmatic phenomenon. Recently, Schlenker (2008, 2009) revives this idea and demonstrates that the local contexts can be derived via pragmatic reasoning. Suppose that pragmatic reasoning is available in every language (for its pragmatic nature). The Japanese paradigm above then suggests that the local context *derived via pragmatic reasoning* is enough to filter presuppositions but not to license bathroom anaphora, polarity-reversed sluicing, or the domain restriction of a modal. I conjecture licensing them requires the local context to be present *semantically*: in some languages like English, the local context derived via pragmatic reasoning is lexicalized, and it is involved in semantic computation, hence licensing bathroom anaphora, etc; in other languages like Japanese, the local context is not lexicalized, and it only shows up for a limited purpose, e.g., presupposition filtering.

The intuition is that presupposition projections are computed *separately* from anaphoric resolution, ellipsis resolution, or domain restriction. The idea might be best formalized in Karttunen and Peters (1979) *two-dimensional semantics*. That is, the local context exists both in the assertion and the presuppositional dimensions in English but only in the presuppositional dimension in Japanese. I leave the formalization of this idea for future work.

Finally, I mention a possible explanation on *why* the local context is absent in Japanese 'ϕ *ka* ψ.' So far, I have assumed that 'ϕ *ka* ψ' is semantically equivalent to 'ϕ *or* ψ' (modulo the local context). This is not necessarily the case, however. Shimoyama (2006) claims that the Japanese disjunction is derived by existentially quantifying over a set of propositions,[22] rather than the disjunction being a connective. Suppose then that Shimoyama (2006) is right, and the English disjunction is formulated in the classical way. Then although 'ϕ *ka* ψ' and 'ϕ *or* ψ are truth conditionally equivalent, the difference in how they are formed may be relevant to whether or not the local context exists.[23] The validity of this idea depends on how other languages that are argued to form disjunctions by quantifying alternatives – Hungarian, Sinhara, etc. – behave with respect to the phenomena investigated in this study.

[21] Note also that the presence of the presupposition filtering effect and the infelicity of bathroom anaphora together are at odds with the conjecture that presuppositions and anaphora exhibit parallel behaviors (Van der Sandt 1992; Krahmer 1998; Geurts 1999).

[22] See Szabolcsi (2015) for a proposal in the same spirit but in a different formalization. See also Aloni (2007) for an articulated logic of alternatives.

[23] Note, however, the difference disappears in *inquisitive semantics* (Ciardelli et al. 2018). Nevertheless, Erlewine (2017) claims that two disjunctive markers in Mandarin Chinese, *haishi* and *huòzhe*, coincide with the alternative and the boolean disjunctions, respectively, and they do show semantic differences.

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