

2. I argue (5-a) is actually ambiguous between two LFs, depending on the scope of distributivity with respect to tense and aspect:

- (6) a. **High distributivity:** For each of Mary and Jane, there is some past time such that they hugged the other at that time.
- b. **Low distributivity:** There is some past time such that Jane and Mary each hugged the other at that time.

3. Finally, I show that the principle in (7) can account for the difference in truth-conditions between the covert reciprocal in (4-a) and the overt counterpart in (4-b) by ensuring that only the LF corresponding to low distributivity is available for (4-a):

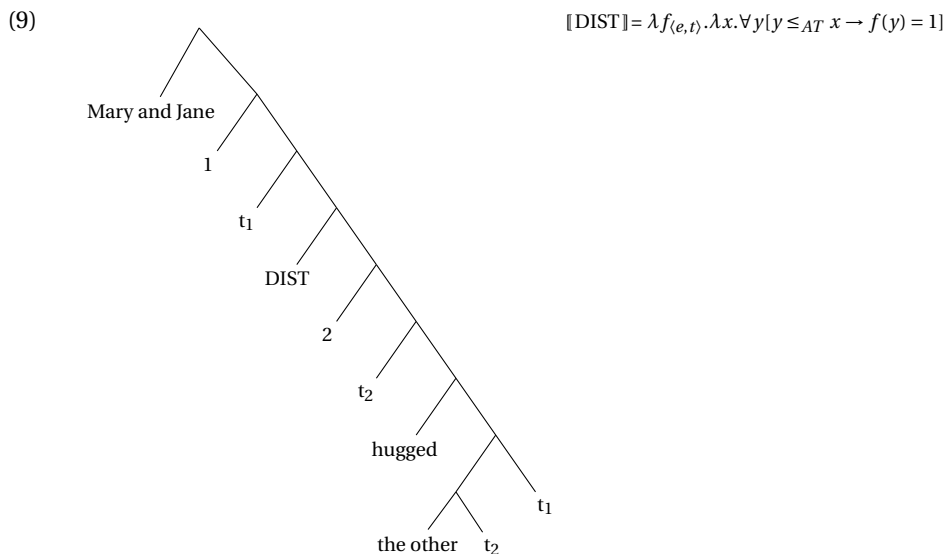
- (7) **Restriction on Covert Reciprocity:** The *each other* in a reciprocal can be ellided only if the reciprocal is bound at the lowest scope possible.

- In section 3, I provide two test-cases where the predictions of the syntactic account and the lexical one come apart and show that the predictions of the syntactic approach outlined above are borne out:
 1. The interaction of covert reciprocals with negation.
 2. The behavior of covert reciprocals in the Lebanese Arabic double subject construction.

2 A syntactic account of reciprocal alternations

2.1 Decompositional accounts of reciprocals

- I adopt the implementation of this approach from Sauerland (1998):
 1. The *each other* is interpreted as a definite DP *the other*, which first takes a contrast argument and then a range argument, as shown in (8):
 - (8) a. $\llbracket \text{the others} \rrbracket = \lambda x. \lambda y. y \ominus x$, defined iff $x < y$
 - b. $y \ominus x$ is the maximal individual z s.t. $z \leq y \wedge \neg \exists x' : x' \leq x \wedge x' \leq z$
 - c. $\llbracket \text{the others} \rrbracket (j)(j \oplus m) = m$
 2. The subject moves twice, first binding the contrast argument (t_2) and then the range argument (t_1). The contrast argument is interpreted distributively (due to DIST) and the range argument collectively¹:



¹The LF in (9) uses a distributivity operator DIST which distributes to atoms and not the pluralization operator. For the simple cases discussed in this talk, this distinction will not matter, but see Sauerland (1998) for arguments that the pluralization operator * is needed here.

3. The following truth-conditions are predicted for (9):

$$(10) \quad \llbracket (9) \rrbracket = 1 \text{ iff} \\ \lambda y. ((\text{DIST}(\lambda x. \llbracket \text{hugged} \rrbracket(x)(y \ominus x))) (y)) (m \oplus j) = 1 \text{ iff} \\ \llbracket \text{hugged} \rrbracket(m)(j) = 1 \wedge \llbracket \text{hugged} \rrbracket(j)(m) = 1$$

2.2 Proposal

- Recall that we want to explain the differences in truth-conditions between overt reciprocals in (11-b) and the covert counterpart in (11-a):

- (11) Context: Jane hugged Mary while she was sleeping and then Mary fell asleep and Jane woke up and hugged her.
- #Jane and Mary hugged.
 - Jane and Mary hugged each other.

- I take the main truth-conditional difference between the covert reciprocal and the overt counterpart to be that only the former has a simultaneity requirement:
 - The overt reciprocal *Jane and Mary hugged each other* can be true even when the events of Jane hugging Mary and of Mary hugging Jane happen at different times.
 - The covert counterpart *Jane and Mary hugged* requires the two events to be simultaneous.
- We see the same contrast with other predicates that participate in this alternation, like *kiss* and *fall in love*:

- (12) **Context:** Jane and Mary were friends, and Mary fell in love with Jane, but Jane wasn't interested in her. After Mary lost interest, Jane fell in love with Mary, but by that point Mary didn't love her back.
- Jane and Mary fell in love with each other.
 - # Jane and Mary fell in love.

- (13) **Context:** Jane kissed Mary on the cheek while she was sleeping and then she fell asleep and Mary woke up and kissed her on the cheek.
- # Jane and Mary kissed.
 - Jane and Mary kissed each other.

- I argue that this truth-conditional difference is due to a difference in where the contrast and range arguments are bound in the two cases, relative to an existential quantifier over times, which I take to be contributed by aspect:

1. In the overt reciprocal, the arguments of *the other* can be bound below aspect, giving rise to a simultaneous reading or above aspect, giving rise to a possibly non-simultaneous reading:

- (14) a. **Non-simultaneous reading:** For each of Mary and Jane there is some past time such that they hugged the other at that time.
 b. **Simultaneous reading:** There is some past time such that each of Mary and Jane hugged the other.

2. In the covert reciprocal, the arguments must be bound below aspect and therefore only the simultaneous reading is available.

- There is independent evidence that there is a distinct LF giving rise to a simultaneous reading with overt reciprocals. Consider (15):

(15) Context: There's a reality TV show observing couples after a fight. Couples 1-3 hugged and made up after the fight. Couple 4 was Jane and Mary. Jane hugged Mary after the fight but Mary didn't want to hug her back. Later when Jane was taking a nap, Mary went and hugged her. Couples 1-3 got a prize, but Jane and Mary didn't.

- Every couple who hugged each other the day of the fight got a prize.
 - Simultaneous reading:** Every couple who hugged each other at the same time the day of the fight got a prize. (True)
 - Non-simultaneous reading: Every couple who each hugged the other at some time got a prize. (Not True)

- If the reciprocal in (15-a) only had a single LF corresponding to the possibly non-simultaneous reading in (22), we would incorrectly predict (15-a) to be not true in the given context.

- I will start by giving a proposal for overt reciprocals that predicts this ambiguity.

- I make the following assumptions about tense and aspect:

- I assume that predicates take a time interval as their first argument (16)²:

$$(16) \quad \llbracket \text{hug} \rrbracket = \lambda t. \lambda x. \lambda y. y \text{ hugged } x \text{ throughout } t$$

- Tense is referential:

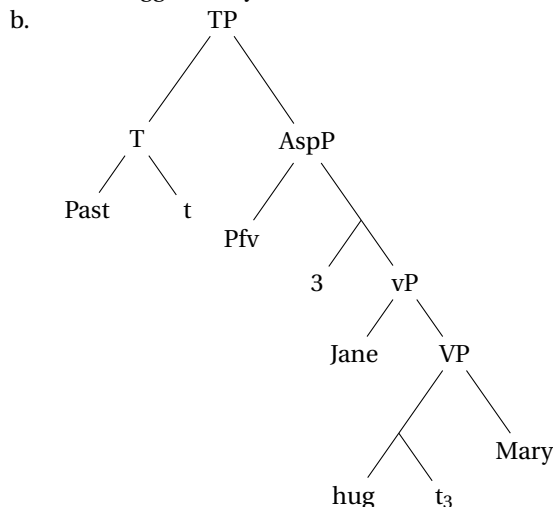
$$(17) \quad \llbracket \text{Past} \rrbracket^c = \lambda t : t < t_c. t$$

- Perfective aspect standardly picks out a time within the time interval that tense refers to:

$$(18) \quad \llbracket \text{Pfv} \rrbracket = \lambda P. \lambda t. \exists t' \subseteq t : P(t') = 1$$

- First let's see how this works with a simple example:

(19) a. Jane hugged Mary.



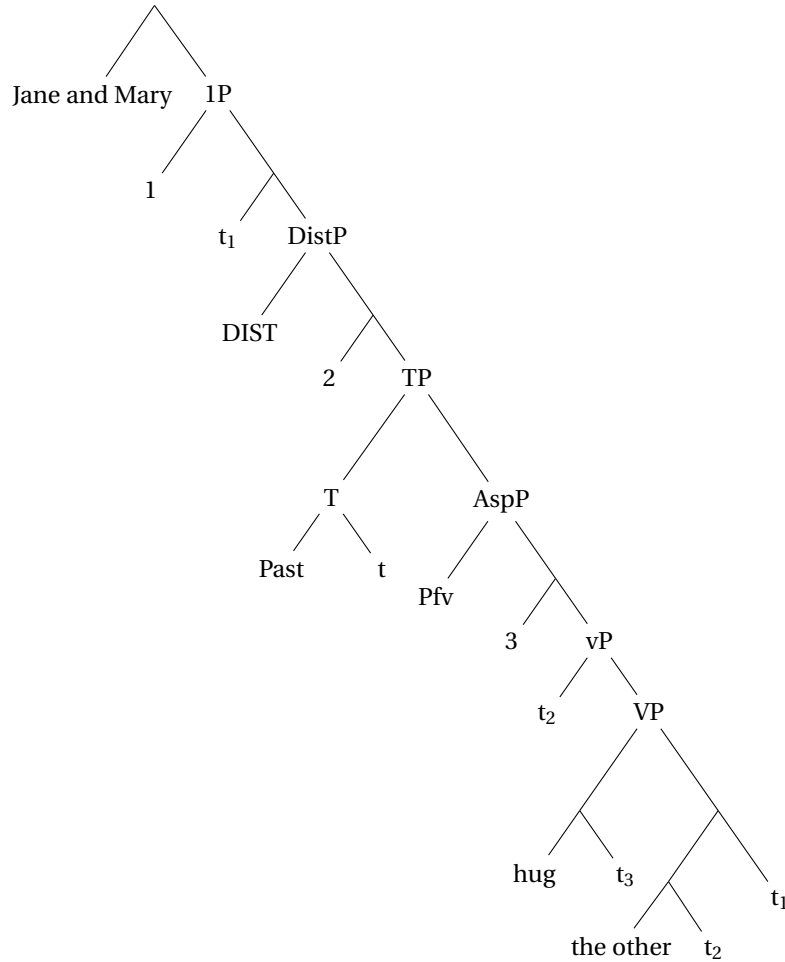
c. $\llbracket \text{TP} \rrbracket^c = 1$ iff $\exists t' \subseteq t : \llbracket \text{hug} \rrbracket(t')(m)(j) = 1$, defined iff $t < t_c$

²I assume here that perfective picks out a time interval and that a predicate like *hug* is true if it is true of its individual arguments throughout that time interval. An alternative would be to assume that perfective picks out a time point and that *hug* is true if it is true of its individual arguments at that time point. For the cases I illustrate here with *hug*, this distinction is not relevant, but it becomes relevant when we consider other predicates like *fall in love* etc. I will set this discussion aside for the purposes of this talk.

- Now, assuming that binding of the reciprocal arguments is free to occur above or below aspect, we expect (at least) two possible LFs for (20)³.

(20) Jane and Mary hugged each other.

- LF with binding above tense and aspect:



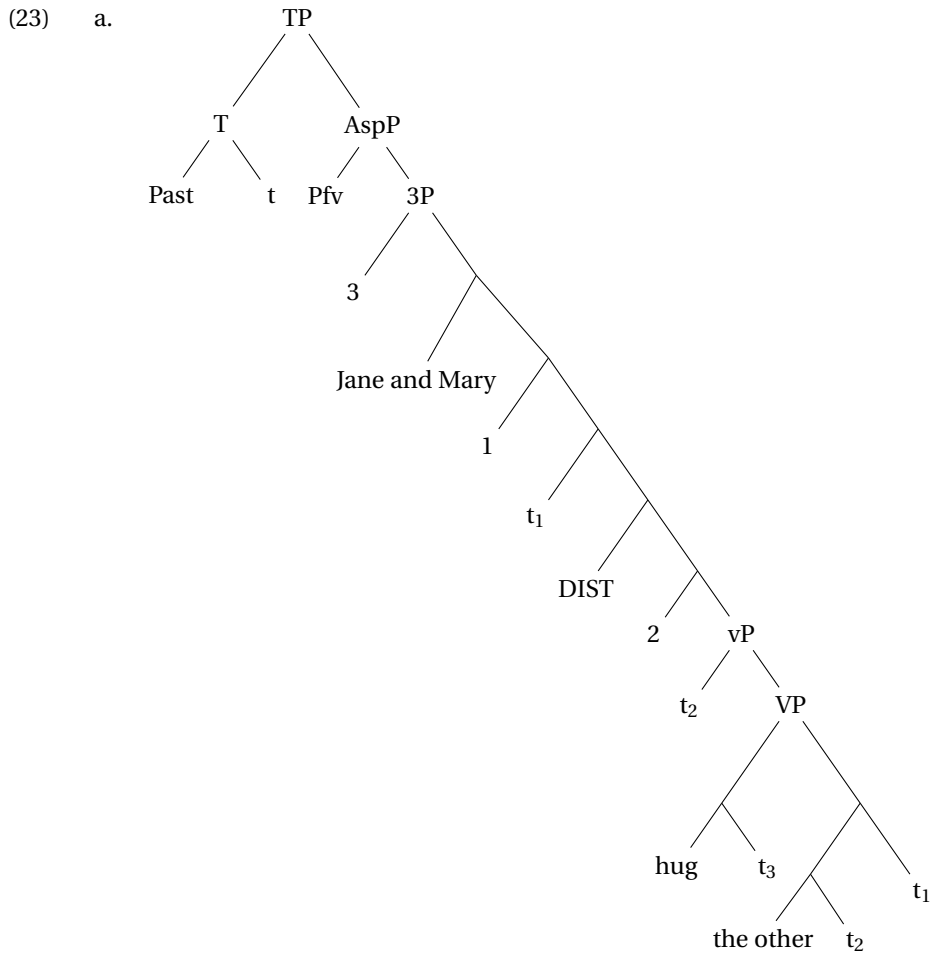
- (21) a. $\llbracket \text{TP} \rrbracket^c = 1$ iff $\exists t' \subseteq t : \llbracket \text{hug} \rrbracket(t')(t_1 \ominus t_2)(t_2) = 1$, defined iff $t < t_c$
 b. $\llbracket (21\text{-a}) \rrbracket^c = 1$ iff $\exists t' \subseteq t : \llbracket \text{hug} \rrbracket(t')(j)(m) = 1 \wedge \exists t'' \subseteq t : \llbracket \text{hug} \rrbracket(t'')(m)(j) = 1$, where $t < t_c$

- Here, distributivity takes scope above aspect, and we get the possibly non-simultaneous reading:

(22) **Non-simultaneous reading:** For each of Mary and Jane there is some past time such that they hugged the other at that time.

³In the interest of time, I only consider here the LFs where both arguments are bound above aspect or both below aspect.

- LF with binding below tense and aspect:



- b. $\llbracket 3P \rrbracket = \lambda t. \llbracket \text{hug} \rrbracket (t)(m)(j) = 1 \wedge \llbracket \text{hug} \rrbracket (t)(j)(m) = 1$
 c. $\llbracket \text{TP} \rrbracket^c = 1$ iff $\exists t' \subseteq t : \llbracket \text{hug} \rrbracket (t')(m)(j) = 1 \wedge \llbracket \text{hug} \rrbracket (t')(j)(m) = 1$, defined iff $t < t_c$

- Here, the distributivity takes scope below aspect and we get the simultaneous reading:

(24) **Simultaneous reading:** There is some past time such that each of Mary and Jane hugged the other at that time.

- We can now see that the restriction in (25) predicts the truth-conditional differences between overt and covert reciprocals:

(25) **Restriction on Covert Reciprocity:** The *each other* in a reciprocal can be ellided only if the contrast and range arguments of *the other* are bound at the lowest possible position.

- Note that the principle in (25) can also explain why only overt reciprocals can have long-distance reciprocal readings (Heim et al., 1991; Carson, 1998). (27) is correctly predicted to only have the reading with low distributivity in (b):

(26) Jane and Mary said that they hugged each other.

- a. **High distributivity:** Each of Jane and Mary said that they hugged the other.
 b. **Low distributivity:** Jane and Mary said that each of them hugged the other.

(27) Jane and Mary said that they hugged.

- This can be seen by the fact that only the overt reciprocal is true in the following context:

(28) **Context:** Jane said that she hugged Mary but that Mary didn't hug her back. Mary said that she hugged Jane but that Jane didn't hug her back.

- While I have only looked at a couple of case-studies here, the hope is that any truth-conditional differences between overt and covert reciprocals can be reduced to the principle in (25)

3 Evidence for the syntactic account

- In section 2, I argued that, like overt reciprocals, the LF for covert reciprocals involve distributivity. The only difference between the two is the scope of this distributivity relative to tense and aspect.
- In this section, I will present two pieces of evidence for this account which both argue for the presence of a distributivity operator in the LF for covert reciprocals:
 1. Both covert and overt reciprocals are not licensed in the Lebanese Arabic double subject construction, which in general blocks distributive readings.
 2. Both covert and overt reciprocals give rise to a homogeneity gap, even when the subject denotes an individual of cardinality 2 (e.g. *Jane and Mary*), which is not expected if the predicate is purely collective.
- In both of these cases, covert reciprocals pattern with overt reciprocals and unlike 1-place collective predicates, thus arguing against an alternative lexical account.

3.1 Double subject construction

- The Lebanese Arabic double subject construction, exemplified in (29-b), does not allow for distributive readings over the lower conjoined subject (Wehbe, 2023)⁴:

(29) a. Karim w Hadi raʔaso.
 Karim and Hadi danced.3PL.
 Karim and Hadi danced.
 b. Karim raʔas howwe w Hadi.
 Karim danced.3SG.M him and Hadi.
 Karim and Hadi danced together.

- Overt reciprocals are infelicitous in the Lebanese Arabic double subject construction when the higher subject is singular:

(30) a. Karim w Hadi be:so baʕdon.
 Karim and Hadi kissed.3PL each-other.
 Karim and Hadi hugged each other.
 b. #Karim be:s howwe w Hadi baʕdon.
 Karim kiss.3SG.M him and Hadi each-other.
 'Intended: Karim and Hadi kissed each other'

- This is expected by the compositional analysis of reciprocals. Since the lower subject in the double subject construction can't be distributed over, it is not possible to get a the desired reciprocal reading over it in (30-b).

⁴I have argued in previous work that this is because the lower subject has to be interpreted in its base position and pluralization operators, responsible for the distributive readings, can only apply to predicates derived by movement and therefore have to take scope above the lower subject.

- The lexical and syntactic analyses make different predictions with respect to how covert reciprocals behave in the double subject construction:
 1. For the lexical analysis, since covert reciprocals are in fact 1-place collective predicates, they should be licensed in this construction ⁵
 2. For the syntactic analysis, the LF for the covert reciprocal also involves distributivity over the subject and therefore should behave just like the overt reciprocal counterpart in (30-b).
- The predictions of the syntactic account are borne out: the covert reciprocal in (31-b) is infelicitous in the double subject construction

- (31) a. Karim w Hadi be:so
 Karim and Hadi kissed.3PL
 Karim and Hadi kissed.
- b. #Karim be:s howwe w Hadi.
 Karim kiss.3SG him and Hadi.
 ‘Intended: Karim and Hadi kissed each other’

3.2 Homogeneity

- Covert reciprocals and their negated counterparts do not have complementary truth-conditions: neither (32-a) nor its negated counterpart in (32-b) seem completely appropriate in (32). ⁶

- (32) **Context:** Jane hugged Mary while she was sleeping.
- a. # Jane and Mary hugged.
- b. # Jane and Mary didn’t hug.

- Similarly, the overt reciprocal and its negated counterpart are also both not true in the context in (32):

- (33) **Context:** Jane hugged Mary while she was sleeping.
- a. # Jane and Mary hugged each other.
- b. # Jane and Mary didn’t hug each other.

- On the lexical account, where *hug* is a 1-place collective predicate, without additional stipulations there is no reason to expect the gap in (32) ⁷.
- On the other hand, the syntactic account straightforwardly predicts this.
- Plural predication gives rise to an apparent truth-value gap known as homogeneity (Fodor, 1970; Križ, 2015 a.o.):

- (34) a. [The two students smiled] is true iff both of the students smiled.
- b. [It is not the case that the two students smiled] is true iff neither of the students smiled.
- c. Neither is true if only one of the two students smiled.

⁵Note that in general, the double subject construction is licensed with predicates that only allow for collective readings. Consider *meet*, for example, which in Lebanese Arabic has no transitive counterpart with a DP object:

(i) Rasha jtamaʕit hiyye w Hadi.
 Rasha met her and Hadi.

⁶One speaker I have asked accepted (32-b) in the context in (32) here but still reported a contrast between its acceptability in the context in (32) and an alternative context where neither of Jane and Mary hugged the other. Within the account I propose here, this can potentially be due to non-maximality, which would allow (32-b) to be true here, if the speaker accommodates an appropriate QUD.

⁷Note that while we do get homogeneity in cases where there is underspecification between a collective and a distributive reading (Križ, 2016; Bar-Lev, 2019), 1-place *hug* here would be purely collective when the subject has cardinality 2, so we expect no homogeneity.

- For distributive predication, this can be accounted for by assuming a truth-value gap in the denotation of DIST⁸ (Schwarzschild, 1994; Bar-Lev, 2019):

- (35) For a distributive predicate P, $\text{DIST}(P)(x) =$
- 1 iff $\forall y \leq_{AT} x : P(y) = 1$
 - 0 iff $\neg \exists y \leq_{AT} x : P(y) = 1$

- Since the LF for covert reciprocals involves the distributivity operator DIST, we expect to get homogeneity over the subject *Jane and Mary*. The parallel to (34) is illustrated informally in (36):

- (36) a. $\llbracket \text{Jane and Mary hugged} \rrbracket$ is true iff there is some past time such that each of Jane and Mary hugged the other.
 b. $\llbracket \text{Jane and Mary didn't hug} \rrbracket$ is true iff there is no past time such that either of Jane and Mary hugged the other.
 c. Neither is true otherwise

- The truth-conditions in (37) are predicted for covert reciprocals under negation: *Jane and Mary didn't hug* is correctly predicted to be true iff neither Jane hugged Mary nor Mary hugged Jane⁹.

- (37) $\llbracket \text{Jane and Mary didn't hug} \rrbracket = 1$ iff $\llbracket (23\text{-a}) \rrbracket = 0$ iff
 $(\neg \exists t' \subseteq t : \llbracket \text{hug} \rrbracket(t')(m)(j) = 1) \wedge (\neg \exists t' \subseteq t : \llbracket \text{hug} \rrbracket(t')(j)(m) = 1)$

- This correctly predicts that neither (32a) nor (32b) are true when only one of Jane and Mary hugged the other.

4 Conclusion

- I have argued that the LFs for sentences like (38) involve a covert reciprocal in object position:

- (38) Jane and Mary hugged.

- I provided evidence for a syntactic analysis along the lines of Heim et al. (1991) by showing that, just like with overt reciprocals, we can diagnose the presence of a distributivity operator in the LFs for covert reciprocals.
- I showed that we can account for certain differences in truth-conditions between the covert and overt reciprocals by assuming that binding of the covert reciprocal has to occur as low as possible:

- (39) **Restriction on Covert Reciprocity:** The *each other* in a reciprocal can be ellided only if the contrast and range arguments of *the other* are bound at the lowest possible position.

- This raises an immediate question of what the source of this kind of restriction might be.
- I hope in future work to investigate whether this is part of a general principle that requires implicit arguments to take low scope.
- For example, it has been similarly argued that existential implicit arguments must take narrow scope (Fodor and Fodor, 1980; Bhatt and Pancheva, 2017):

- (40) John ate (something).

- (41) a. Exactly half of the students ate something. half >> something; something >> half
 b. Exactly half of the students ate. half >> Something; *something >> half

⁸Bar-Lev (2019) argues that the relevant operator is the pluralization operator * and not DIST here, but again the distinction between the two is not relevant here.

⁹Assuming Strong Kleene projection for homogeneity.

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