Research Article

SLOPPY IDENTITY IN VP ELLIPSIS AND BOUND VARIABLE ANAPHORA

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A R T I C L E   I N F O

A B S T R A C T

It is a well-known fact that a sloppy reading and bound variable anaphora are constrained in the same way (Keenan (1971), Sag (1976), Williams (1977), Partee (1978), Reinhart (1983), Heim &Kratzer (1998), Safir (2004), Büring (2005), McKillen (2016)). The main goal of this article is to show that a sloppy reading and bound variable anaphora are not constrained in the same way. There are two hypotheses with regard to sloppy identity. One hypothesis is that local anaphors yield a sloppy reading only (Heim &Kratzer (1998)), whereas pronouns give rise to the strict/sloppy ambiguity under VP ellipsis (Heim &Kratzer (1998), Büring (2005)). The other hypothesis is that anaphors and pronouns produce the strict/sloppy ambiguity (McKillen 2016). It is worth pointing out that the Korean reflexives *caki*'self', *caki-casin*'self-self', and *casin*'self' induce only a sloppy reading under VP ellipsis, whereas *ku-casin*'he-self' produces the strict/sloppy ambiguity. On the other hand, the Korean pronoun *ku*'he' yields a strict reading only. It is noteworthy that a strict readingcomes from the assumption that pronouns are a referring expression, whereas a sloppy reading comes from the assumption that they function as a bound variable. This amounts to saying that a sloppy reading comes from bound variable anaphora. However, this article argues that when it comes to *caki*'self' and *ku-casin*'he-self', there is a discrepancy between a sloppy reading and bound variable anaphora. This leads us to hypothesize that a sloppy reading and bound variable anaphora are not constrained in the same way.

INTRODUCTION

The ultimate goal of this article is to show that a sloppy reading and bound anaphora are not constrained in the same way. It is a well-known fact that a strict reading comes from the assumption that pronouns can be referential, whereas a sloppy reading comes from the assumption that pronouns can be a bound variable. This in turn implies that a sloppy reading comes from bound variable anaphora. The organization of this article is as follows. In section 2, we examine two hypotheses with regard to sloppy identity. One hypothesis is that local anaphors yield a sloppy reading only (Heim & Kratzer (1998)), whereas pronouns give rise to the strict/sloppy ambiguity under VP ellipsis (Heim & Kratzer (1998), Büring (2005)). On the other hand, the other hypothesis is that anaphors and pronouns produce the strict/sloppy ambiguity (McKillen 2016). We show that the Korean reflexive *caki*'self', *caki-casin*'self-self', and *casin*'self' induce only a sloppy reading under VP ellipsis, *ku-casin*'he-self' produces the strict/sloppy ambiguity, and the Korean pronoun *ku*'he' yields only a strict reading. In section 3, we examine McKillen's (2016) claim that a strict reading comes from the assumption that pronouns are referential, whereas a sloppy reading comes from the assumption that pronouns are a bound variable.

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In section 4, we maintain that in the case of local *caki*'self' and *ku-casin*'he-self', there is a discrepancy between a sloppy reading and bound variable anaphora. This leads to the assumption that bound variable anaphora does not necessarily comes froma sloppy reading.

Previous Analyses

There are two traditional hypotheses with regard to sloppy identity. One hypothesis is that local anaphors yield a sloppy reading only (Heim & Kratzer (1998)), whereas pronouns give rise to the strict/sloppy ambiguity under VP ellipsis (Heim & Kratzer (1998), Büring (2005)). On the other hand, the other hypothesis is that anaphors and pronouns produce the strict/sloppy ambiguity (McKillen 2016). Safir (1989) assumes, along with Lebeaux (1984, 1985), that anaphors induce a sloppy reading, whereas pronouns yield the strict/sloppy ambiguity:

1. Tom defended himself and Mary did too.

   (sloppy) Mary is an x such that x defended x.

2. Tom hit his brother and Mary did too.

   - (sloppy) Mary is an x such that x hit x's brother.
   - (strict) Mary is an x such that x hit Tom's brother.

As illustrated in (1), the second conjunct induces a sloppy reading only. On the other hand, the second conjunct in (2) gives rise to the strict/sloppy ambiguity, as illustrated in (2a) and (2b). Williams (1977) argues that reflexives never induce a non-sloppy reading. This in turn indicates that in the Williams-Lebeaux-Safir-Heim &Kratzer approach, anaphors give rise to a sloppy reading only. However, McKillen (2016) argues that when a reflexive appears inside an elided VP, there is an ambiguity.

3. John defended himself before Bill did too.

In (3), the reflexive can induce a strict reading and have the same antecedent in the elided VP as it does in the overt VP. On the other hand, the reflexive can also be interpreted as sloppy and have a different antecedent in the elided VP. In order to verify whether the two hypotheses are on the right track, let us turn our attention to Korean sentences:

4. Tom-icaki-lulonghohayss-ko James-to kule-hayssta.

    NOM self-ACC defend-COMP also so-did
(Tom defended himself and James did, too.)
(sloppy) James is an x such that x defended x.
(strict) *James is an x such that x defended Tom.

5. Tom-iku-cain-ulonghohayss-ko James-to kule-hayssta.

    NOM he-self-ACC defended-COMP also so-did
(Tom defended himself and James did, too.)
(sloppy) James is an x such that x defended x.
(strict) James is an x such that x defended Tom.

6. Tom-icaki-casin-ulonghohayss-ko James-to kule-hayssta.

    NOM self-self-ACC defend-COMP also so-did
(Tom defended himself and James did, too.)
(sloppy) James is an x such that x defended x.
(strict) *James is an x such that x defended Tom.

As indicated in (4), the Korean reflexive *caki*'self' induces only a sloppy reading under VP ellipsis. The second conjunct in (4) does not produce a strict reading. In (6), the Korean reflexive *caki-casin*'self-self' yields only a sloppy reading under VP ellipsis. On the other hand, *ku-casin*'he-self' may induce the strict/sloppy ambiguity. Why does the Korean *ku-casin*'he-self' yield a strict reading under VP ellipsis? We wish to argue that the component part *ku*'he' of *ku-casin*'he-self' always induces a strict reading since *ku*'he' is deictic:

7. Tom-iku-uyhaksayng-ulonghohayss-ko

    NOM he-GEN student-ACC defend-COMP
Mary-to kule-hayssta.
also so-did
(Tom defended his student and Mary does too.)

- (sloppy) *Mary is an x such that x defended x's student.
- (strict) Mary is an x such that x defended Tom's student.

As illustrated in (7), the Korean pronoun *ku*'he' never gives rise to a sloppy reading. Only a non-sloppy reading in the second conjunct is available. Thus, it is reasonable to assume that the Korean *ku-casin*'he-self' produces a strict reading. Now an important question is "why does the Korean reflexive *ku-casin*yield a sloppy reading?" We wish to argue that this is due to the component part *casin*'self' of *ku-casin*'he-self'. Let us observe the following sentence:

8. Tom-icasin-ulonghohayss-ko Mary-to kule-hayssta.
    NOM self-ACC defend-COMP also so-did
(Tom defended himself and Mary did too.)

- (sloppy) Mary is an x such that x defended x.
- (strict) *Mary is an x such that x defended Tom.

As indicated in (8), the Korean reflexive *casin*'self' gives rise to a sloppy reading only. A strict reading is not available in (8). This leads to the fact that the Korean reflexives *caki*'self', *caki-casin*, and *casin*'self' back up the Williams-Lebeaux-Safir-Heim &Kratzer approach, whereas the Korean reflexive *ku-casin*'he-self' supports McKillen (2016). That is to say, the Korean reflexive *caki*'self', *caki-casin*'self-self', and *casin*'self' give rise to a sloppy reading only, whereas the Korean reflexive *ku-casin*'he-self' produces the strict/sloppy ambiguity. Simply put, the two hypotheses are on the right track.

Now let us consider non-local reflexives:

9. Tom-icaki-uychinkwu-lulpiphanhayss-ko
    NOM self-GEN friend-ACC criticized-COMP
John-to kule-hayssta.
also so-did
(Tom criticized his friend and John did too.)

- (sloppy) John is an x such that x criticized x's friend.
- (strict) *John is an x such that x criticized Tom's friend.)

10. Tom-icaki-casin-uychinkwu-lulpiphanhayss-ko
    NOM self-self-GEN friend-ACC criticized-COMP
John-to kule-hayssta.
also so-did
(Tom criticized his friend and John did too.)
- (sloppy) John is an x such that x criticized x's friend.
- (strict) *John is an x such that x criticized Tom's friend.)

11. Tom-iku-casin-uychinkwu-lulpiphanhayss-ko

    NOM he-self-GEN friend-ACC criticized-COMP
John-to kule-hayssta.
also so-did
(Tom criticized his friend and John did too.)

- (sloppy) John is an x such that x criticized x's friend.
- (strict) John is an x such that x criticized Tom's friend.)

As alluded to in (9), the Korean reflexive *caki*'self' which is bound non-locally gives rise to a sloppy reading only. In (10), *caki-casin*'self-self' that is bound non-locally induces a sloppy reading only. On the other hand, the Korean reflexive *ku-casin*'he-self' produces the strict/sloppy ambiguity. This in turn suggests that the non-local reflexives *caki*'self' and *caki-casin*'self-self' lend their support to the Williams-Lebeaux-Safir-Heim &Kratzer approach, whereas the non-local reflexive *ku-casin*'he-self' backs up McKillen (2016). That is to say, the Korean reflexive *caki*'self' and *caki-casin*'self-self' induce a sloppy reading only, whereas the Korean reflexive *ku-casin*'he-self' produces a strict/sloppy reading. From all of this it is clear that the two hypotheses are on the right track.

Now let us turn our attention to Korean pronouns. Let us observe the following sentence:

12. Tom-iku-uyhaksayng-ulonghohayss-ko

    NOM he-GEN student-ACC defended-COMP

John-to kule-hayssta.
also so-did
(Tom defended his student and John did too.)

- (sloppy) *John is an x such that x defended x's student.
- (strict) John is an x such that x defended Tom's student.

As alluded to in (12), the Korean pronoun *ku*'he' gives rise to a strict reading only. *Ku*'he' never induces a sloppy reading under VP ellipsis. This in turn suggests that the Korean pronoun *ku*'he' does not underpin the Heim &Kratzer- Büring-McKillen approach that pronouns give rise to the strict/sloppy ambiguity under VP ellipsis. We thus conclude that the Korean reflexive *caki*'self', *caki-casin*'self-self', and *casin*'self' induce only a sloppy reading under VP ellipsis, *ku-casin*'he-self' produces the strict/sloppy ambiguity, and the Korean pronoun *ku*'he' yields a strict reading only.

Bound Variable Anaphora and a Sloppy Reading

In what follows, we will examine McKillen's (2016) claim that a strict reading comes from the assumption that pronouns are referential, whereas a sloppy reading comes from the assumption that pronouns are a bound variable in the first clause. McKillen (2016) assumes the following:

13.
- LF copying theory of ellipsis
- Condition B
- Pronouns are referential

McKillen (2016) argues that in (14), the VP of the first clause is copied into the ellipsis site, and we get the LF in (15). If 1 is John, then this LF means *John likes John's car and Bill likes John's car*:

14. John likes his car and Bill does [$_{VP}$e] too. (Bill likes John's car.)

15.
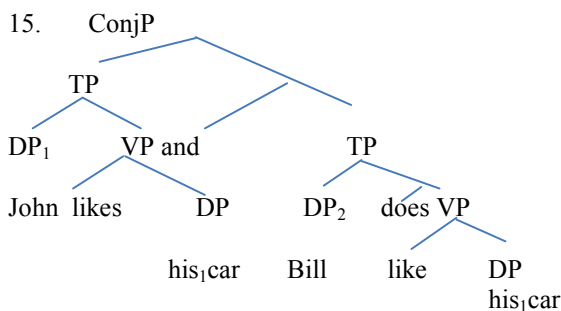
This strategy will not get us sloppy readings though. If we copy the VP, it will always give us *like John's car*. McKillen (2016) argues that we can get a strict reading since pronouns are referential but we cannot get a sloppy reading. As McKillen (2016) points out, the reason why we cannot get a sloppy reading is that we are treating pronouns as necessarily referring expressions. Note that pronouns can take a quantified DP as their antecedents:

16. [$_{DP}$Everyone] thinks that he is intelligent.
For everyone x, x thinks that x is intelligent.

How do we get the intended reading of (16)? QR moves *everyone* to adjoin to a higher node and introduces the variable binder λ1:

17.
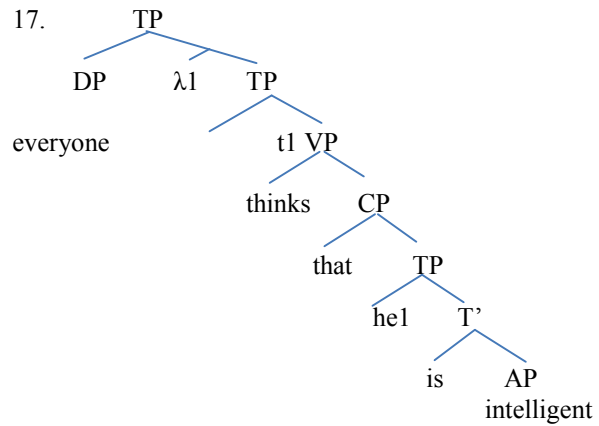
In order to solve the problem of a sloppy reading, McKillen (2016) assumes the following:

18.
- LF copying
- Condition B
- Pronouns can be referential or bound variables.

McKillen (2016) assumes that a sloppy reading comes from the assumption that the pronoun is a bound variable in the first clause. Let us consider the following sentence:

19. John likes his car and Bill does too. (Bill likes Bill's car)

20.
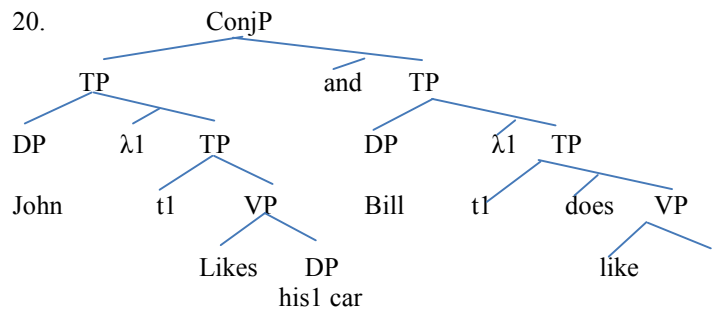
McKillen (2016) argues that if pronouns can be bound variables, a sloppy reading is possible. McKillen (2016) further argues that the fact that a sloppy reading of pronouns exists provides evidence for pronouns being bound variables even without a QDP antecedent. We thus conclude that a strict reading comes from the assumption that the pronoun is referential, whereas a sloppy reading comes from the assumption that the pronoun is a bound variable in the first clause. It is important to note that a sloppy reading alludes to a bound variable without a QDP.

Bound Variable Anaphora and a Sloppy Reading

In what follows, we show that a sloppy reading and bound variable anaphora are not constrained in the same way. Heim &Kratzer (1997), Büring (2005), and McKillen (2016) argue that a sloppy reading in VP deletion alludes to a bound variable reading. Let us observe the following sentences:

21. a. Tom-icaki-lulonghohayssta.

   NOM self-ACC defended
   (Tom defended self.)

   b. Tom-icaki-casin-ulonghohayssta.
   NOM self-self-ACC defended

(Tom defended self-self.)

As alluded to in (21), *caki*'self' and *caki-casin*'self-self' can refer to *Tom*as their referent. Simply put, *caki*'self' and *caki-casin*'self-self' permit local binding. When a DP appears as the antecedent, there is no difference in naturalness between *caki-casin*'self-self' and *caki*'self'. However, when a QP or a Wh-word appears as its antecedent, things are different:

22. a. ???Nwukwunacaki-lulonghohayssta.
    everyone self-ACC defended
    (Everyone defended self.)

    b. Nwukwunacaki-casin-ulonghohayssta.
    everyone self-self –ACC defended
    (Everyone defended self-self.)

As the status of (22a) suggests, the hearer is preferred over the linguistic antecedent as the antecedent of local *caki*'self'. That is to say, a bound variable reading may not be available in this example. However, in the case of (22b), *caki-casin*'self-self' induces a bound variable reading and the occurrence of *caki-casin*'self-self' in (22a) is much more natural. This in turn indicates that local *caki-casin*'self-self' yields a bound variable reading, whereas local *caki*'self' may not yield a bound variable reading.

   Now let us consider the following example:

23. a. Tom-iku-casin-ulonghohayssta.
    NOM he-self-ACC defended
    (Tom defended he-self.)

   b. ???Nwukwunaku-casin-ulonghohayssta.
    everyone he-self-ACC defended
    (Everyone defended he-self.)

    c. Nwukwunacasin-ulonghohayssta.
    everyone self-ACC defended

As indicated in (23a), when a DP appears as the antecedent, (23a) is perfect. However, there is a difference in naturalness between binding by a DP and binding by a quantifier. That is to say, in (23b), a bound variable reading of *ku-casin*'he-self' is somewhat marginal as compared to *casin*'self'. As alluded to (23b), the Korean reflexive *casin*'self' readily induces a bound variable reading.

Now let us consider the following sentences:

24. a. ???Nwu-kacaki-lulonghohayssni?
    who-NOM self-ACC defended
    (Who defended self?)

   b. Nwu-kacaki-casin-ulonghohayssni?
    who-NOM self-self-ACC defended
    (Who defended self-self?)

25. a. ???Nwu-kaku-casin-ulonghohayssni?
    who-NOM he-self-ACC defended
    (Who defended he-self?)

b. Nwu-kacasin-ulonghohayssni?
    who-NOM self-ACC defended
    (Who defended self?)

As illustrated in (24a), the hearer is favored over the Wh-word antecedent as the antecedent of *caki*'self'. That is to say, a bound variable reading of *caki*'self' in (24a) is marginal. On the other hand, *caki-casin*'self-self' readily yields a bound variable reading. Again, the difference in naturalness between *caki-casin*'self-self' and *caki*'self' is sharper when the antecedent is a Wh-word. Unlike *casin*'self-self', a bound

variable reading of *ku-casin*'he-self' is somewhat marginal, but *casin*'self' readily induces a bound variable reading.

Now let us consider non-local reflexives. Let us observe the following sentences:

26. a. Nwukwunacaki-uyai-lulonghohayssta.
    everyone self-GEN child defended
    (Everyone defended his child.)
b. Nwukwunacaki-casin-uyai-lulonghohayssta.
    everyone self-self-GEN child defended
    (Everyone defended his child.)
c. Nwukwunaku-casin-uyai-lulonghohayssta.
    everyone he-self-GEN child defended
    (Everyone defended his child.)
d. Nwukwunacasin-uyai-lulonghohayssta.
    everyone self-GEN child defended
    (Everyone defended his child.)

In (26a), unlike local *caki*'self', non-local *caki*'self' readily yields a bound variable reading. Likewise, as in the case of local *caki-casin*'self-self', non-local *caki-casin*'self-self' easily induces a bound variable reading. The same applies to non-local *ku-casin*'he-self' and *casin*'self'. Non-local *ku-casin*'he-self' and *casin*'self' readily give rise to a bound variable reading. This in turn suggests that non-local *caki*'self', *caki-casin*'self-self', *ku-casin*'he-self', and *casin*'self' induce a bound variable reading. The following table shows the possibility of a bound variable reading of Korean reflexives.

Table 1 A Bound Variable Reading of Anaphors

Anaphors	A Bound Variable Reading
local caki	marginal
local caki-casin	yes
local ku-casin	marginal
local casin	yes
non-local caki	yes
non-local caki-casin	yes
non-local ku-casin	yes
non-local casin	yes

Now let us turn our attention to a sloppy reading of Korean anaphors. Heim &Kratzer (1997), Büring (2005), and McKillen (2016) argue that a sloppy reading in VP deletion alludes to a bound variable reading. We wish to argue, however, that unlike the Heim &Kratzer-Büring-McKillen analysis, a sloppy reading and bound variable anaphora are not constrained in the same way.

Now let us consider the following sentence:

27. Tom-icaki-lulkyekyehayss-ko Mary-to kule-hayssta.
    NOM self-ACC encouraged-COMP also so-did
    (Tom encouraged himself and Mary did, too.)
    (sloppy) Mary is an x such that x encouraged x.
    (strict) *Mary is an x such that x encouraged Tom.

As alluded to in (27), the second conjunct in (27) induces a sloppy reading only. A strict reading in the second conjunct in (27) is not available. The fact that local *caki*'self' induces only a sloppy reading indicates that local *caki*'self' is supposed to yield a bound variable reading if a sloppy reading and bound variable anaphora are constrained in the same way. As observed earlier, when local *caki*'self' is associated with a QP or Wh-word, a bound variable reading is marginal:

28. a. ???Nwukwunacaki-lulonghohayssta.
    everyone self-ACC defended
    (Everyone defended self.)

b. ???Nwu-kacaki-lulonghohayssni?
who-NOM self-ACC defended
(Who defended self.)

In (28a) and (28b), the hearer is favored over the QP antecedent or the Wh-word antecedent as the antecedent of *caki*'self'. From this, it is clear that a sloppy reading and a bound variable reading are not constrained in the same way. Korean data indicate that sloppy readings are one thing and bound variable anaphora is another. In (28a) and (28b), *caki-casin*'self-self' is preferred over *caki*'self' for a bound variable reading. Thus, the Heim &Kratzer-Büring-McKillen analysis that a sloppy reading and bound variable anaphora are constrained in the same way does not work for Korean. Now let us observe non-local *caki*'self':

29. Tom-icaki-uyai-lulkyekyehayss-ko Mary-to kule-hayssta.
NOM self-GEN child-ACC encouraged-COMP also so-did
(Tom encouraged his child and Mary did, too.)
(sloppy) Mary is an x such that x encouraged x's child.
(strict) *Mary is an x such that x encouraged Tom's child.

As indicated in (29), non-local *caki*'self' induces a sloppy reading only. Non-local *caki*'self' in VP deletion does not give rise to a strict reading. As observed earlier, when non-local *caki*'self' is associated with a QP antecedent, it induces a bound variable reading:

30. Nwukwunacaki-uyai-lulonghohayssta.
everyone self-GEN child defended
(Everyone defended his child.)

This indicates that non-local *caki*'self' underpins the claim that a sloppy reading and bound variable anaphora are constrained in the same way. That is to say, non-local *caki*'self' supports the Heim &Kratzer-Büring-McKillen analysis that a sloppy reading and bound variable anaphora are constrained in the same way. Now let us observe the following sentence:

31. Tom-icaki-casin-ulkkocipess-ko Mary-to kule-hayssta.
NOM self-self-ACC pinched-COMP also so-did
(Tom pinched himself and Mary did, too.)
(sloppy) Mary is an x such that x pinched x.
(strict) *Mary is an x such that x pinched Tom.

As illustrated in (31), local *caki-casin*'self-self' gives rise to a sloppy reading only. It is clear that local *caki-casin*'self-self' does not give rise to the strict/sloppy ambiguity under VP ellipsis. As observed earlier, *caki-casin*'self-self' readily induces a bound variable reading, which in turn indicates that local *caki-casin*'self-self' supports the claim that a sloppy reading and bound variable anaphora are constrained in the same way. Now let us observe non-local *caki-casin*'self-self'.

32. Tom-icaki-casin-uyai-lulkkocipess-ko Mary-to kule-hayssta.
NOM self-self-GEN child-ACC pinched-COMP also so-did
(Tom pinched his child and Mary did, too.)
(sloppy) Mary is an x such that x pinched x's child.
(strict) *Mary is an x such that x pinched Tom's child.

As indicated in (32), non-local *caki-casin*'self-self' gives rise to only a sloppy reading. As observed earlier, non-local *caki-casin*'self-self' behaves as a bound variable, which in turn suggests that non-local *caki-casin*'self-self' lends support to

the claim that a sloppy reading and bound variable anaphora are constrained in the same way.
Now let us consider the following sentence:

33. Tom-icasin-ulkyekyehayss-ko Mary-to kule-hayssta.
NOM self-ACC encouraged-COMP also so-did
(Tom encouraged himself and Mary did, too.)
(sloppy) Mary is an x such that x encouraged x.
(strict) *Mary is an x such that x encouraged Tom.

As indicated in (33), local *casin*'self' induces a sloppy reading only. As illustrated in (23c) and (25b), local *casin*'self' can function as a bound variable, which in turn indicates that a sloppy reading and bound variable anaphora are constrained in the same way.
Now let us observe the following sentence:

34. Tom-icasin-ulai-lulkyekyehayss-ko Mary-to kule-hayssta.
NOM self-GEN child-ACC encouraged-COMP also so-did
(Tom encouraged his child and Mary did, too.)
(sloppy) Mary is an x such that x encouraged x's child.
(strict) *Mary is an x such that x encouraged Tom's child.

As illustrated in (34), *casin*'self' does not induce a strict reading. In (34), *casin*'self' yields a sloppy reading only. As indicated below, when non-local *casin*'self' is associated with a QP, it induces a bound variable reading, which in turn indicates that a sloppy readings and bound variable anaphora are constrained in the same way.

35. Nwukwunacasin-uyai-lulonghohayssta.
everyone self-GEN child defended
(Everyone defended his child.)

Clearly, non-local *casin*'self' lends support to the claim that a sloppy reading alludes to bound variable anaphora.
Now let us turn our attention to local *ku-casin*'he-self'.

36. Tom-iku-casin-ulonghohayss-ko
NOM he-self-ACC defended-COMP
Mary-to kule-hayssta.
also so-did
(Tom defended himself and Mary did too.)
- (sloppy) Mary is an x such that x defended x.
- (strict) Mary is an x such that x defended Tom.)

As illustrated in (36), *ku-casin*'he-self' gives rise to the sloppy/strict ambiguity in VP ellipsis. However, as indicated below, when *ku-casin*'he-self' is associated with a Wh-word antecedent, a bound variable reading of *ku-casin*'he-self' is somewhat marginal as compared to *casin*'self'. As expected, *casin*'self' readily yields a bound variable reading:

37. a. ??Nwu-kaku-casin-ulonghohayssni?
who-NOM he-self-ACC defended
(Who defended he-self?)
b. Nwu-kacasin-ulonghohayssni?
who-NOM self-ACC defended
(Who defended self?)

This indicates that there is a discrepancy between a sloppy reading and a bound variable reading. However, non-local *ku-casin*'he-self' easily induces a bound variable reading and gives rise to the sloppy/strict ambiguity:

38. Nwukwunaku-casin-uyai-lulonghohayssta.
everyone he-self-GEN child defended
(Everyone defended his child.)

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39. Tom-iku-casin-uyai-lulonghohayss-ko
    NOM he-self-GEN child-ACC defended-COMP
    Mary-to kule-hayssta.
    also so-did

(Tom defended his child and Mary did too.)

- (sloppy) Mary is an x such that x defended x's child.
- (strict) Mary is an x such that x criticized Tom's child.)

As illustrated in (38), non-local *ku-casin*'he-self' readily yields a bound variable reading and it gives rise to the sloppy/strict ambiguity, which indicates that non-local *ku-casin*'he-self' backs up the claim that a sloppy reading alludes to a bound variable reading. The outcome of our discussion is as follows:

Table 2 A Bound Variable Reading and a Sloppy Reading of Anaphors

Anaphors	Bound Variable Reading	Sloppy Reading
local caki	marginal	yes
local caki-casin	yes	yes
local ku-casin	marginal	yes
local casin	yes	yes
non-local caki	yes	yes
non-local caki-casin	yes	yes
non-local ku-casin	yes	yes
non-local casin	yes	yes

We thus conclude that in the case of local *caki*'self' and *ku-casin*'he-self', there is a discrepancy between a sloppy reading and bound variable anaphora. This leads to the assumption that a sloppy reading does not necessarily mean bound variable anaphora.

CONCLUSION

The main purpose of this article is to show that a sloppy reading and bound variable anaphora are not constrained in the same way. A strict reading is comes from the assumption that pronouns are referential, whereas a sloppy reading comes from the assumption that pronouns are a bound variable. This indicates that a sloppy reading comes from bound variable anaphora. In section 2, we have examined two hypotheses with respect sloppy identity. One hypothesis is that local anaphors yield a sloppy reading only (Heim & Kratzer (1988)), whereas pronouns give rise to the strict/sloppy ambiguity under VP ellipsis (Heim & Kratzer (1988), Büring (2005)).

On the other hand, the other hypothesis is that anaphors and pronouns produce the strict/sloppy ambiguity (McKillen 2016). We have shown that the Korean reflexives *caki*'self', *caki-casin* 'self-self', and *casin* 'self' only induce a sloppy reading under VP ellipsis, whereas *ku-casin*'he-self' produces the strict/sloppy ambiguity. On the other hand, the Korean pronoun *ku*'he' yields a strict reading only. In section 3, we have examined McKillen's (2016) claim. That is to say, McKillen (2016) argues that a strict reading comes from the assumption that pronouns are referential, whereas a sloppy reading comes from the assumption that they are a bound variable. In section 4, we have maintained that in the case of local *caki*'self' and *ku-casin*'he-self', there is a discrepancy between a sloppy reading and bound variable anaphora. This leads to the assumption that a sloppy reading does not necessarily allude to bound variable anaphora.

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