External and internal *same*: A unified account motivated by attitude reports[1]

Linmin Zhang – New York University

Abstract. I use empirical evidence from attitude reports to motivate a new characterization of natural language identity relation. More specifically, when *de dicto* attitude reports express an identity relation (e.g., *John thinks A is B*, *John thinks A and B are the same*), felicitous *de re* reports corresponding to them are systematically absent. This finding means that the identity relation encoded in natural language cannot be analyzed as a simple co-reference relation. Instead, I propose that in a given context, the identity relation between A and B means that contextually salient properties of A hold in certain worlds (e.g., in the belief worlds of an attitude holder) for B and vice versa. Based on this, I propose a new unified account for internal and external uses of *same*. Essentially, *same* is anaphoric: its antecedent is a plurality of individuals (i.e., *res*) and *same* means the intersection of contextually salient properties of each atomic individual involved in an identity relation.

Keywords: identity relation, *same*, *be*, attitude reports, *de re*, *de dicto*, Frege's Puzzle.

1. Introduction

As illustrated in (1a) and (1b), (i) *A is B (and B is A)* and (ii) *A and B are the same* are typical natural language schemas for expressing the identity relation between A and B. Traditionally, the identity relation has been analyzed as $\lambda x_e.\lambda y_e.[x = y]$ (see Frege 1892 and recent studies on copula *be* and adjective *same*, e.g., Heim 1985, Solomon 2009, Brasoveanu 2011, Percus and Sharvit 2014, Hardt and Mikkelsen 2015). However, simply using '$=$' to formally represent the identity relation cannot characterize the human cognitive mechanism underlying the use of these natural language identity expressions, and consequently, leaves Frege's Puzzle unaccounted for. As illustrated in (2), (2a) and (2b) certainly have different cognitive values: while (2a) is a trivially informative tautology, (2b) contains significant astronomical information.

(1)   Expressing the identity relation between Phosphorus and Hesperus in English:

    a.   Phosphorus **is** Hesperus (and Hesperus **is** Phosphorus).

    b.   Phosphorus and Hesperus are the **same**.

(2)   Frege's Puzzle:

    a.   Phosphorus is Phosphorus. $\rightsquigarrow$ A tautology

    b.   Phosphorus is Hesperus. $\rightsquigarrow$ Not a tautology

Zhang (2016) uses empirical evidence from attitude reports to show that the identity relation in natural language cannot be a co-reference relation. Instead, (3) is proposed to characterize the meaning of natural language identity relation. Based on (3), Zhang (2016) further studies the semantics of **symmetric** *be*. Here I pursue this line of research and focus on ***same***.

(3)   The semantics of identity relation in natural language:
      The identity relation between A and B is a **mutual predication**: contextually salient properties coerced from the individual (i.e., *res*) referred to with the expression A hold in contextually relevant worlds for the *res* referred to with the expression B, and vice versa.

The main claim of the current paper is that, essentially, *same* is anaphoric: its antecedent is a plurality of individuals (i.e., *res*) and *same* means the intersection of contextually salient properties of each atomic individual involved in an identity relation.

§2 – §4 briefly summarize Zhang (2016). §2 presents empirical evidence: felicitous *de dicto* reports expressing an identity relation cannot have felicitous *de re* reports corresponding to them. Based on the neo-Russellianism, §3 shows the reasoning that leads to this conclusion: in *de dicto* reports expressing an identity relation, the semantic contribution of the expressions of *res* names cannot be purely extensional. Then §4 analyzes the semantics of symmetric *be*. Based on §2 – §4, §5 presents a new analysis for *same*. §6 further addresses several issues of *same* and gives a unified account for internal *same* and external *same*. §7 concludes the paper and suggests avenues for future research.

2. Empirical evidence: Attitude reports of identity relation

This section is inspired by and based on Percus and Sharvit (2014). Percus and Sharvit (2014) aim to account for the asymmetry of attitude reports in **mistaken identity contexts** (see also Cumming 2008). As illustrated in (4), in a mistaken identity context, such as (4a), the narrator's statement (4b), i.e., *Kevin thinks that Becky is Dan*, is an intuitively true and felicitous attitude report. Moreover, as Cumming (2008) and Percus and Sharvit (2014) point out, in this situation, the narrator Jim can even add *but of course he doesn't think that Dan is Becky*, and intuitively, we still judge what Jim says to be true, felicitous and self-consistent.

(4)   a.   MISTAKEN IDENTITY CONTEXT:
           Peter is throwing a party in honor of his cousin Dan who has just been awarded his PhD. All the guests know that, but they don't all know Dan (and some of them, like Kevin, don't even know the new PhD's name). When Becky arrives, Kevin, who is already completely toasted, walks up to her with a big smile. 'You must be proud to be a doctor now,' he says, 'is your wife coming too?' Seeing this, Jim says to Peter:
      b.   'Kevin thinks that Becky is Dan, (but of course he doesn't think that Dan is Becky).'
           ⤳ A true and felicitous *de re* report

Based on our judgment for (4b), Percus and Sharvit (2014) claim that attitude reports motivate an **asymmetric** use of *be*.[2] Notice that under the given context (4a), the attitude holder Kevin doesn't know the name of the individual who is actually Becky. Thus *Kevin thinks that Becky is Dan* can only be felicitous as a ***de re*** report, but not as a ***de dicto*** report (see Sudo 2014 among many others). The felicity of (4b) indicates that asymmetric *be* can be used in *de re* attitude reports.

Now I present new empirical data showing that (i) attitude reports motivate not only an **asymmetric** *be*, but also a **symmetric** *be*, and (ii) more interestingly, while felicitous *de dicto* reports using asymmetric *be* can have felicitous *de re* reports corresponding to them, felicitous *de dicto* reports expressing an identity relation (via the use of *same* or symmetric *be*) cannot. In the following, (5) presents the common background for (6) and (7), which present two different sub-contexts.

(5)　ANONYMOUS REVIEWING CONTEXT:
　　　After submitting a paper to a journal, John gets an anonymous review for his paper. The review is actually written by Mary, but of course, John doesn't know this. Mike is an editor of the journal and he knows that Mary is the reviewer.

(6)　SUB-CONTEXT A – PREDICATION CONTEXT:
　　　Afterwards, when John meets Mike, he tells Mike that he finds the review is very old-fashioned and shows a certain empathy for baldness, and John says: 'I think the author of the review should be a bald man in his 90s.' Mike discloses nothing to John, but later he tells the whole story to another person, Tim:

de dicto reports			*corresponding de re* reports	
a.	'John thinks that the reviewer **is** a bald man in his 90s.'	✓	a′. 'John thinks that Mary **is** a bald man in his 90s.'	✓
b.	'John thinks that a bald man in his 90s **is** the reviewer.'	✗	b′. 'John thinks that a bald man in his 90s **is** Mary.'	✗
c.	'John thinks that the reviewer and a 90-year old bald man are the **same** person.'	✗	c′. 'John thinks that Mary and a 90-year old bald man are the **same** person.'	✗

(7)　SUB-CONTEXT B – IDENTITY CONTEXT:
　　　Afterwards, John and Mike go to a conference. There John sees a bald man in his 90s talking about John's paper with others. Based on what he sees, John says to Mike: 'The old guy must have reviewed my paper.' Mike discloses nothing to John, but later Mike tells the whole story to another person, Tim:

---

[2]In fact, Percus and Sharvit (2014) point out that with a special intonation pattern, the narrator Jim can utter *Kevin thinks that DAN is BECky* to express the same meaning as *Kevin thinks that Becky is Dan* (cf. *A doctor you might consult is John*, see Mikkelsen 2005). Percus and Sharvit (2014) analyze this kind of inversion cases as the result of a focus projection. In this paper, I do not consider this kind of attitude reports that have a focus projection, a special intonation pattern, and an inverse reading.

	de dicto reports			corresponding *de re* reports	
a.	'John thinks that the reviewer **is** a bald man in his 90s.'	✓	a′.	'John thinks that Mary **is** a bald man in his 90s.'	✗
b.	'John thinks that a bald man in his 90s **is** the reviewer.'	✓	b′.	'John thinks that a bald man in his 90s **is** Mary.'	✗
c.	'John thinks that the reviewer and a 90-year old bald man are the **same** person.'	✓	c′.	'John thinks that Mary and a 90-year old bald man are the **same** person.'	✗

Obviously, given the common background (5), *the anonymous reviewer* and *Mary* are two co-referring names in both (6) and (7). As (6) shows, under this predication sub-context, (6c) is an infelicitous *de dicto* report, and there is a contrast between the felicity judgment of the two *de dicto* reports (6a) and (6b). These judgments indicate that in the *de dicto* reports (6a) and (6b), copula *be* has an asymmetric reading. The judgment of (6a′) indicates that under this sub-context, the felicitous *de dicto* report (6a) can have a felicitous *de re* report corresponding to it.

In contrast, as (7) shows, under this identity sub-context, (7c) is a felicitous *de dicto* report, and moreover, (7a) and (7b) are both felicitous *de dicto* reports. These judgments indicate that in the *de dicto* reports (7a) and (7b), copula *be* has a symmetric reading, and all these three *de dicto* reports (7a) – (7c) express the attitude holder's view on an identity relation. Intriguingly, under this identity sub-context (7), though the *de dicto* reports (7a) – (7a) are all felicitous, none of them has a felicitous corresponding *de re* report: (7a′) – (7c′) are all intuitively judged to be infelicitous.

Therefore, from the empirical data shown in (6) and (7), we can have the following generalization:

(8)   **Generalization on attitude reports expressing an identity relation**:
          A *de dicto* attitude report expressing an identity relation between *res* has no felicitous *de re* reports corresponding to it.

3. Proposal: The semantics of identity relation

According to the neo-Russellian view of attitude reports, which is shown in (9), the truth and felicity of a *de re* report depends on (i) the truth of its corresponding *de dicto* report and (ii) the co-referring relation between individual (i.e., *res*) names. Notice that from (9), it does not follow that felicitous *de dicto* reports always have felicitous *de re* reports corresponding to them.

(9)   The neo-Russellian view of attitude reports (see McKay and Nelson 2014):
          Felicitous *de re* attitude reports are derived from felicitous *de dicto* attitude reports via the substitution of co-referring *res* names.

In fact, the substitution of co-referring *res* names *salva veritate* has several requirements. First and the most importantly, as Quine (1956) claims, an attitude report can be considered as a relation among three items: (i) an attitude holder X, (ii) a *res* named Y of type e, and (iii) a property P of type $\langle s, et \rangle$, and the relation among them can be phrased as 'the attitude holder X ascribes to the *res* named Y the property P', i.e., P holds for Y in w ($w \in$ Attitude(X)). Crucially, Quine (1956) points out that the substitution of co-referring *res* names *salva veritate* is based on the fact that the semantic contribution of Y is in effect purely **extensional**.[3]

Second, as Kaplan (1969) and Lewis (1979) emphasize, an appropriate *res* for an attitude holder needs to stand in **an acquaintance relation** with the attitude holder so that the *res* becomes **a character in the inner story of the attitude holder**. What this amounts to is that (i) the same real character in the actually world can become different characters in the inner story of an attitude holder (imagine that some people fail to recognize that Dr. Jekyll and Mr. Hyde are the same actual person and consider them to be two characters in their inner story), and (ii) different real characters in the actual world can become one single character in the inner story of an attitude holder, if the attitude holder fails to tell that they are actually different characters.[4]

Third, as Anna Szabolcsi (p.c.) points out, *de re* readings are possible only when there is a narrator who is personally involved in the whole situation, so that (i) the narrator understands what constitutes a *res* for the attitude holder and (ii) the co-reference relation between *res* names holds for the narrator. The substitution of co-referring *res* names is actually done by the narrator.[5] In other words, though a *res* is different from a real character in the actual world, it is an objective being of type e, which is not private to the attitude holder. If *res* were private, interlocutors (e.g., narrators) would not be able to mention and discuss it, and no communication would be possible.

Now let us take a closer look at (6) and (7). The fundamental difference between these two sub-contexts is the number of *res* in the inner story of the attitude holder John. As summarized in the table (10), in the predication sub-context (6), the attitude holder John has access only to **one *res***, namely the author of the review he reads, and he is acquainted with this *res* only through reading the review written by this *res*. In contrast, in the identity sub-context (7), the attitude holder John has access to **two *res***: (i) the author of the review, and (ii) the old man standing before John. John has access to these two *res* through two acquaintance relations: he is acquainted with the *res* 'the author of the review' through knowing that his paper is reviewed by this *res*; in addition, he is acquainted with the *res* 'the bald man in his 90s' through seeing this *res* talking about his paper. The upshot is that in a ***de dicto* report of identity relation**, there are necessarily **more than one *res***, and eventually the attitude holder draws the conclusion that there is an identity relation between these *res*.

---

[3]See Sudo (2014) for a more generalized view: the *res* of attitude reports is not necessarily some individual of type e, but can be anything the semantic contribution of which is purely extensional in attitude reports.

[4]SPOILER ALERT: consider how Angier views Alfred Borden in Christopher Nolan's 2006 film *The Prestige*.

[5]As a consequence, what we mean by **reference world** or **actual world** in attitude reports should actually be understood as a world in the set of the narrator's belief worlds.

(10)   Comparing the empirical data shown in (6) and (7):

	Predication sub-context (6)	Identity sub-context (7)
number of *res*	1 (the reviewer)	2 (the reviewer and an old man)
de dicto reports	(6a): predication statement	(7a) – (7c): identity statements
the use of *be*	asymmetric	symmetric
de re reports	available: see (6a′)	unavailable: see (7a′) – (7c′)

Now recall that the substitution of co-referring *res* names *salva veritate* can happen if and only if the semantic contribution of *res* names is purely extensional. Therefore, the failure of substituting co-referring *res* names for *de dicto* reports of identity relation indicates that in these *de dicto* reports, the semantic contribution of the expressions used as *res* names is **not purely extensional**. Thus, following Quine (1956)'s analysis of attitude reports, I propose (3) to characterize the meaning of natural language identity relation: essentially, the identity relation is a mutual predication, i.e., contextually salient properties coerced from each individual involved in an identity relation hold for all the other individuals involved in this identity relation.

Thus, the generalization (8) can be easily accounted for within the neo-Russellian view of attitude reports. In an identity relation, since *res* names contribute both extensionally (as *res* names to refer to individuals) and intensionally (as contextually salient properties), the first requirement for the substitution of co-referring name *salva veritate* cannot be satisfied. As a consequence, no felicitous *de re* report can be derived from felicitous *de dicto* reports expressing an identity relation.

4. Accounting for the symmetric use of copula *be*

Based on §3, I propose (11) and (12) as the semantics of asymmetric *be* and symmetric *be*:

(11)   a. $[\![\text{be}_{\text{asymmetric}}]\!]^w_{\langle\langle s,et\rangle,et\rangle} \stackrel{\text{def}}{=} \lambda P_{\langle s,et\rangle}.\lambda x_e.P(w)(x)$

   b. $[\![\text{be}_{\text{asymmetric}}]\!]^w_{\langle e,et\rangle} \stackrel{\text{def}}{=} \lambda y_e.\lambda x_e.P_{(w,y)}(w)(x)$ $\qquad\qquad P_{(w,y)}$ is of type $\langle s, et\rangle$.

(12) $[\![\text{be}_{\text{symmetric}}]\!]^w_{\langle e,et\rangle} \stackrel{\text{def}}{=} \lambda y_e.\lambda x_e.P_{(w,y)}(w)(x) \wedge P_{(w,x)}(w)(y)$

(11a) shows that asymmetric *be* relates a property P of type $\langle s, et\rangle$ and an individual x of type e, and the property holds for the individual in a relevant world. (11b) shows that when asymmetric *be* apparently relates two expressions of individual names y and x, one of the expressions (say y) is coerced into and interpreted as some contextually salient property in a certain world w (represented as $P_{(w,y)}$ here), and asymmetric *be* further relates the property $P_{(w,y)}$ and the individual x. For example, in the case of (4b), there is an asymmetry between the two proper names *Becky* and *Dan*: the name *Dan* is coerced into a property, i.e., the contextually unique new PhD. The attitude holder

Kevin has established an acquaintance relation only with one *res*, namely the newly arrived guest, and Kevin ascribes to this individual the property of being the new PhD, i.e., the property of 'being Dan'. Therefore, it follows that Kevin thinks that Becky has the contextually salient property of Dan, i.e., Kevin thinks that Becky is Dan. On the other hand, there is no acquaintance relation between the attitude holder Kevin and the individual Dan. Then it follows naturally that Kevin cannot ascribe any property to this individual, i.e., Kevin cannot ascribe to the individual named Dan the property of being Becky, and thus Kevin doesn't think that Dan is Becky.

As (12) shows, symmetric *be* relates two *res* names y and x (of type e), and there are two contextually salient properties coerced from these two names, i.e., $P_{(w,y)}$ and $P_{(w,x)}$, so that the contextually salient property $P_{(w,y)}$ holds for the *res* named x in the given possible world w, and similarly, the contextually salient property $P_{(w,x)}$ holds for the *res* named y in the given possible word w. Evidently, in (7), two *res*, *the reviewer* and *a bald man in his 90s* are related by a symmetric *be*, and thus both of these names contribute extensionally (as *res* names) and intensionally (as properties). Since their contribution is not purely extensional, it follows necessarily that the generalization in (8) holds and the name *the reviewer* cannot be replaced by *Mary* to derive a *de re* report.

(13) shows Percus and Sharvit (2014)'s analysis of asymmetric *be*: when asymmetric *be* relates two expressions of individual names x and y, a contextually salient type shifter f (of type $\langle e, se\rangle$) takes one individual (say y) as its argument and returns a contextually salient individual concept $f(y)$, and asymmetric *be* further relates $f(y)$ and x. In addition to the use of predication (instead of '='), there is another difference between my lexical entry (11b) and (13): (11b) has no type shifter of type $\langle e, \langle s, et\rangle\rangle$ that turns individuals of type e into properties of $\langle s, et\rangle$.

(13) $[\![\text{be}_{\text{asymmetric}}]\!]^w_{\langle e, et\rangle} \stackrel{\text{def}}{=} \lambda y_e.\lambda x_e.x = [f_{\langle e, se\rangle}(y)](w)$ Percus and Sharvit (2014) (cf. (11b))

A type shifter is a function, which means that it always returns the same value when taking arguments of the same value. As (14) illustrates, in Sub-context 1 – (14a), it is only the property of being beautiful that is relevant, and here the meaning of $P_{(w\in\text{Dox(Snape)}, \text{Evans})}$ roughly means *as beautiful as Evans*; while in Sub-context 2 – (14b), it is only the property of being intelligent that is relevant, and here the meaning of $P_{(w\in\text{Dox(Snape)}, \text{Evans})}$ roughly means *as intelligent as Evans*. In other words, even though in Snape's belief worlds, Evans always has the properties of being beautiful and being clever, $P_{(w\in\text{Dox(Snape)}, \text{Evans})}$ does not always have the same interpretation.

(14)   BACKGROUND: Snape always thinks that Evans is a beautiful and intelligent woman.
a. SUB-CONTEXT 1: One day, Snape remotely sees a beautiful woman and thinks that she must be Evans. Having known this, Lupin tells Potter:
a′. 'Snape thinks that beautiful woman is Evans.'
b. SUB-CONTEXT 2: One day, Snape sees a very cleverly designed magic potion and thinks that it must be made by Evans. Having known this, Lupin tells Potter:

b′. 'Snape thinks the one who has made the potion is Evans.'

Presumably, the exact meaning of $P_{(\text{possible world, name expression})}$ reflects what property an attitude holder associates with an expression in a certain context and involves a complex cognitive process for the attitude holder in perceiving the name in the context. Thus, the relation between a name expression (say y) and the property coerced from it (say $P_{(w,y)}$) is certainly beyond compositional semantics. It is for this reason that I choose not to use a type shifter to perform this coercion job.

5. The semantics of *Phosphorus and Hesperus are the same*

Here I provide a new analysis of *same*, so as to capture the fact that (1a) and (1b) entail each other. My proposal for the semantics of *same* is shown in (15). As (15) shows, *same* has an adjectival type, i.e., $\langle et \rangle$. The interpretation of *same* requires a plurality of individuals to be its antecedent. Here I use the variable xs to represent this plurality of individuals: xs means a list of entities of type e. A list, e.g., $\boxed{5, 2, 2, ...}$, represents a sequence of values, where (i) values are of the same type and (ii) the order among the items in a list is recorded and thus the same value may occur more than once. If the values of a list are of type α, then the type of the list is $[\alpha]$. Here xs is of type $[e]$. *Same* denotes the intersection of contextually salient properties $P_{(w,x_i)}$ coerced from each element x_i in this plurality xs, i.e., the intersection of $P_{(w,x_i)}(w)$.[6]

(15) $[\![\text{same}]\!]^w_{\langle et \rangle} \stackrel{\text{def}}{=} \bigcap_{x_i \in xs} P_{(w,x_i)}(w)$

When the possible world w is omitted, $[\![\text{same}]\!]_{\langle et \rangle} \stackrel{\text{def}}{=} \bigcap_{x_i \in xs} P_{x_i}$

Following Zhang (2015), I analyze *and* as a list marker, and propose to use a silent operator f (which essentially means fold) to bridge between a list and the rest part of the semantic derivation of a sentence. As (16) shows, f takes a list xs of type $[\alpha]$ and returns a partially applied function, so that later when this partially applied function takes an operator argument (e.g., $\wedge$, $\oplus$), the list can be flattened, as (17) illustrates. The use of fold is defined in a recursive way.

(16) $f_{\langle [\alpha], \langle \langle \alpha, \alpha\alpha \rangle, \alpha \rangle \rangle} \stackrel{\text{def}}{=} \lambda xs_{[\alpha]}.(\lambda g_{\langle \alpha, \alpha\alpha \rangle}.\text{fold } g \ xs)$, in which
(i) fold $g \ \boxed{\ }$ is undefined ($\boxed{\ }$ is an empty list); (ii) fold $g \ \boxed{x} = x$ ($\boxed{x}$ is a singleton list);
(iii) fold $g \ (xs \text{ cons } x) = g \ (\text{fold } g \ xs) \ x$
$(xs \text{ cons } x)$ stands for the resultant list of adding an item x on the right side of a list xs.

---

[6]The use of lists in natural language semantics has been independently motivated in Zhang (2015), and a similar view, namely using a multiset in analyzing *same*, has also been proposed in Kubota and Levine (2015). Of course, this plurality of entities can also be written as a **(multi)set** $\{X\}$ or a **sum** X of entities. I choose to use lists in this paper to facilitate the compositional derivation of *Bill and Susan read the same book*, which I will show in §6.2.

(17) $\llbracket$Al and Cal$\rrbracket = f \boxed{\text{Al, Cal}} = \lambda g.\text{fold } g \boxed{\text{Al, Cal}}$

    a.   When $g = \sqcap$ (and *Al* and *Cal* are of type $\langle et, t\rangle$), $\llbracket(17)\rrbracket = \lambda P.[\text{Al}(P) \sqcap \text{Cal}(P)]$

    b.   When $g = \oplus$ (and *Al* and *Cal* are of type e), $\llbracket(17)\rrbracket = \text{Al} \oplus \text{Cal}$

(18) shows another operator fmap as well as its definitions for two **type constructors** – list $\boxed{\cdot}$ and function $(\lambda x_{r.\ \dots})_{r\rightarrow}$. A type constructor f (e.g., $\boxed{\cdot}$) takes a concrete **type** (e.g., α) to build a new concrete type (e.g., $[\alpha]$ – a concrete list type). To facilitate reading, I mark the first argument of fmap in red and the second argument of fmap in blue, and here type $\langle\alpha\beta\rangle$ is written as $\alpha \rightarrow \beta$. (18c) shows the function f that will be used in the current paper.

(18)   Type of fmap: $(a \rightarrow b) \rightarrow f\ a \rightarrow f\ b$ (f is a type constructor)

    a. f is $\boxed{\cdot}$: $\mathsf{fmap}\ k_{a\rightarrow b}\ \square = \square$; $\mathsf{fmap}\ k_{a\rightarrow b}\ (xs\ \mathsf{cons}\ x)_{[\alpha]} = (\mathsf{fmap}\ k\ xs)\ \mathsf{cons}\ (k\ x)$

    b. f is $(\lambda x_r.\ \dots)_{r\rightarrow}$: $\mathsf{fmap}\ k_{a\rightarrow b}\ g_{r\rightarrow a} = \lambda x_r.k(g(x))$

    c.   When f is a composition of $\lambda g.\mathsf{fold}\ g\dots$ and $\boxed{\cdot}$, $f = \lambda g.\mathsf{fold}\ g\ \boxed{\cdot}$.

Based on (15), (16) and (18), (19) shows the derivation of (1b):

(19)   a. $\llbracket$Phosphorus and Hesperus$\rrbracket = \lambda g.\mathsf{fold}\ g\ \boxed{\text{Phosphorus, Hesperus}}$

    b. $\because$ Here $xs = \boxed{\text{Phosphorus, Hesperus}}$,   (see (15))
        $\therefore \llbracket$same$\rrbracket = P_{\text{Phosphorus}} \sqcap P_{\text{Hesperus}} = \lambda x.[P_{\text{Phosphorus}}(x) \wedge P_{\text{Hesperus}}(x)]$

    c.   Assume here the contribution of *the* is vacuous,[7] and the use of *be* is asymmetric,
        $\llbracket$Phosphorus and Hesperus are the same$\rrbracket$
        $\Leftrightarrow \mathsf{fmap}\ \llbracket$be the same$\rrbracket\ \llbracket$Phosphorus and Hesperus$\rrbracket$
        $\Leftrightarrow \mathsf{fmap}\ \lambda x.[P_{\text{Phosphorus}}(x) \wedge P_{\text{Hesperus}}(x)]\ \lambda g.\mathsf{fold}\ g\ \boxed{\text{Phosphorus, Hesperus}}$
        $\Leftrightarrow \lambda g.\mathsf{fold}\ g\ \boxed{\lambda x.[P_{\text{Ph}}(x) \wedge P_{\text{He}}(x)](\text{Ph}), \lambda x.[P_{\text{Ph}}(x) \wedge P_{\text{He}}(x)](\text{He})}$

    d.   When $g = \wedge$, this is equivalent to $P_{\text{Phosphorus}}(\text{Phosphorus}) \wedge P_{\text{Hesperus}}(\text{Phosphorus})$
        $\wedge P_{\text{Phosphorus}}(\text{Hesperus}) \wedge P_{\text{Hesperus}}(\text{Hesperus})$.
        Since $P_{\text{Phosphorus}}(\text{Phosphorus})$ and $P_{\text{Hesperus}}(\text{Hesperus})$ are tautologies, this is equivalent to $P_{\text{Hesperus}}(\text{Phosphorus}) \wedge P_{\text{Phosphorus}}(\text{Hesperus})$, which is a mutual predication.
        $\therefore \llbracket(1a)\rrbracket = \llbracket(1b)\rrbracket = P_{\text{Hesperus}}(\text{Phosphorus}) \wedge P_{\text{Phosphorus}}(\text{Hesperus})$

As shown in the last line of (19), the current analysis of *same* accounts for the mutual entailment between (1a) and (1b). Moreover, when these two sentences (1a) and (1b) are embedded in attitude reports, individual names *Phosphorus* and *Hesperus* will contribute both extensionally as names and intensionally as properties (i.e., $P_{(w,\text{Phosphorus})}$ and $P_{(w,\text{Hesperus})}$), thus it follows that *de dicto* reports containing this kind of identity statements have no corresponding *de re* reports.

---

[7]I will further discuss this issue in §6.5.

Finally, the current analysis can also account for Frege's Puzzle in a very natural way. Since the identity relation in natural language is not a co-reference relation, it follows that stating an identity relation between expressions A and A is different from stating an identity relation between A and B: the former is a tautology, while the later is a mutual predication and provides new information.

6. A unified semantics of internal *same* and external *same*

In §5, I have proposed a new analysis of *same* which accounts for (i) the mutual entailment relation between (1a) *Phosphorus is Hesperus (and Hesperus is Phosphorus)* and (1b) *Phosphorus and Hesperus are the same*, (ii) the fact that *de dicto* attitude reports expressing an identity relation lack corresponding *de re* reports (i.e., the generalization in (8)), as well as (iii) Frege's Puzzle (see (2)). In this section, I further extend my analysis to give a unified analysis of internal and external *same*, and account for some other behaviors of *same*.

As (20) illustrates, in (20a), the felicitous use of external *same* requires the existence of a contextually salient book prior to the utterance of *Susan read the same book*, and evidently, in this case, this requirement is satisfied – it is *War and Peace*, a book also read by Bill. In contrast, in (20b), the use of internal *same* does not have this requirement, and essentially *the same book* here means a book commonly read by both Bill and Susan.

(20)   a.   Bill read *War and Peace*. Susan read the **same** book.   External *same*
          b.   Bill and Susan read the **same** book.   Internal *same*

I start with a discussion of Heim (1985) and the presuppositional requirement of *same* in §6.1. Then §6.2 presents my account for internal *same* and external *same*. Afterwards, I address three issues on *same* that have been much debated in previous literature: its scope taking behavior (§6.3), its island effects (§6.4) as well as the obligatory use of *the* in using *same* (§6.5).

6.1. The presuppositional requirement of *same*

According to Heim (1985), *same* sentences require the interpretative convention shown in (21):

(21)   'same $\langle A \rangle f$' is true iff for all x, y in A: $f(x) = f(y)$.   (Heim 1985)

Thus, under Heim (1985)'s analysis, the sentence (20b) (repeated here as (22a)) should be interpreted in the way (22b) shows. Heim (1985)'s analysis is certainly consistent with our intuition for *same* sentences. It is also consistent with the current analysis: the only difference is that the current analysis further specifies the meaning of the identity relation between $f(x)$ and $f(y)$.

(22) a. Bill and Susan read the same book.   (20b)
      b. Heim (1985)'s analysis: the book that Bill read = the book that Susan read
          i.e., The book that Bill read and the book that Susan read are the same.

As a consequence, Heim (1985)'s analysis suggests that *same* brings a presuppositional require-ment: for each of the individuals x and y, there is a contextually unique or most salient $f(x)/f(y)$ corresponding to it. Evidently, only when $f(x)$ and $f(y)$ exist and are contextually definite (or salient) individuals can we further judge whether there is an identity relation between them. Es-sentially, this is also consistent with the current analysis: *same* is anaphoric and requires a plurality of contextually salient items to be its antecedent.

(23)   The presuppositional requirement of *same*:
        Same requires the existence of a plurality of **contextually salient / unique** individuals.

(24) – (27) provide further evidence: intuitively, the two sentences in each pair have the same meaning, and all these sentences presuppose that there is a definite unicorn such that John saw it and that there is a definite unicorn such that Bill saw it. Thus (24) – (27) show that the presuppo-sitional requirement (23) does project in negation, questions and modal contexts.

(24) a. John and Bill saw the same unicorn.
      b. The unicorn John saw and the unicorn Bill saw are the same.

(25) a. John and Bill didn't see the same unicorn.   Negation
      b. The unicorn John saw and the unicorn Bill saw are not the same.

(26) a. Did John and Bill see the same unicorn?   Question
      b. Are the unicorn John saw and the unicorn Bill saw the same?

(27) a. John and Bill might have seen the same unicorn.   Modal context
      b. The unicorn John saw and the unicorn Bill saw might be the same.

6.1.1. Is eventuality a necessary ingredient in the semantics of *same*?

According to Hardt and Mikkelsen (2015), eventuality is a necessary ingredient in the semantics of *same*. Their crucial evidence is illustrated in (28). The contrast between (28a) and (28b) shows that simply introducing an individual (here the book *War and Peace*) into a discourse can license the use of a pronoun (here *it*), but it is not sufficient for licensing the use of external *same*.

(28)   Bill didn't read *War and Peace*,

        a.   *but Susan read the same book.

        b.   but Susan read it.

To account for (28), Hardt and Mikkelsen (2015) adopt Kehler (2002)'s Parallel (see (29)) and propose that the felicitous use of *same* has to be based on a parallelism between events (see (30)).

(29)   Kehler (2002)'s Parallel:
        Infer $P(a_1, a_2, ...)$ from the assertion of $S1$ and $P(b_1, b_2, ...)$ from the assertion of $S2$, for a (non-trivial) common P and similar a_i and b_i.

(30) $e_1 : R_1(a_1, ..., a_n) \wedge e_2 : R_2(b_1, ..., b_m) \wedge \textbf{parallel}(e_1, e_2)$
        $\Leftrightarrow \text{Parallel}(R_1(a_1, ..., a_n), R_2(b_1, ..., b_m))$

In Hardt and Mikkelsen (2015)'s analysis, *same* must compare two eventualities. However, in (28), the event 'Bill read *War and Peace*' is embedded under negation and thus cannot be an accessible discourse referent (dref) for subsequent discourse. Therefore, there is no event that is parallel with the event 'Susan read the same book', and this accounts for the weirdness of (28a).

Here I argue that the lack of parallelism between eventualities cannot be a satisfactory account for the weirdness of (28a). Instead, the weirdness of (28a) should be related to the presuppositional requirement of *same*. First, notice that while (28a) is weird, (31) is a good sentence, no matter whether *didn't* is inserted or not. This indicates that when the presuppositional requirement of *same* is satisfied, even though *the book that Bill didn't read* contains a negation and there is no event parallelism between *Bill didn't read a certain book* and *Susan read a certain book*, it is still felicitous to compare the two individuals 'the book Bill didn't read' and 'the book Susan read'. (31) suggests that eventuality parallelism is not necessary in licensing the use of *same*. Second, as (32) illustrates, when there are two books that are equally salient in the context, the use of *same* is infelicitous. This indicates that when the presuppositional requirement of *same* is not satisfied, even though the event 'Bill read Emma / Madame Bovary' can be an accessible event dref for subsequent discourse and in parallel with the event 'Susan read the same book', *same* cannot be used. (32) suggests that eventuality parallelism is not sufficient in licensing the use of *same*.

(31)   The book that Bill didn't read and the book that Susan (didn't) read are the same.

(32)   Bill read *Emma* and *Madame Bovary*. *Susan read the same book.

Presumably, though both a positive sentence such as *Bill read Emma* and a negative sentence such as *Bill didn't read Emma* can introduce *Emma* as a dref, these two instances of *Emma* have different contextual salience. For the negative sentence *Bill didn't read Emma*, it is less natural to assume that *Emma* is the contextually unique (or most salient) book that Bill didn't read, which makes it harder to satisfy the presuppositional requirement of *same*. A full investigation of this issue certainly needs experimental data and is left for future research.

6.1.2. Why *Everyone has the same friend* sounds weird?

(33a) illustrates another relevant issue discussed in Hardt and Mikkelsen (2015): Simon Charlow points out that (33a) is a weird sentence. To account for its weirdness, Hardt and Mikkelsen (2015) claim that *friend* is a relational noun, and relational nouns require indefinites or other weak quantifiers (see (33b)). However, as naturally occurring examples (34) and (35) illustrate, *the same* can be compatible with relational nouns (e.g., *age, birthday*).

(33) a. #Everyone has the same friend.
      b.   Everyone has a friend.

(34) Q5 presented them with a purported induction proof that in any finite group of Americans, **everyone has the same age** (and hence all Americans have the same age).
      http://mooctalk.org/2014/11/29/do-all-americans-have-the-same-age/

(35) ... when **everyone has the same birthday** ...
      https://prezi.com/lx06svu6xldn/chance-of-the-same-birthday/

Under the current analysis, this difference between *friend* and *age/birthday* can be easily accounted for by the presuppositional requirement of *same*. It is pragmatically weird to assume that each individual has only one unique friend, but for each individual, there is a unique age and a unique birthday corresponding to him or her. Consequently, while (34) and (35) can satisfy the presuppositional requirement of *same*, (33a) cannot, which explains the weirdness of this sentence.

6.2. Internal *same* and external *same*

Having shown the presuppositional requirement of *same*, here I give a unified compositional account for sentences containing internal *same* and external *same*. As Heim (1985)'s interpretation convention (21) suggests, the crucial point is to derive the list $\boxed{f(x), f(y), ...}$ from the list $\boxed{x, y, ...}$. With the use of fmap (see (18)), this can be easily done for the case of (20b):

(36)　⟦Bill and Susan read the same book⟧　　　　　　　　　　　　　　　(20b)

    a. $⟦\text{read}⟧_{⟨e,et⟩} \overset{\text{def}}{=} \lambda z.\lambda x.\text{read}(z)(x)$　　　　　　　$\rightsquigarrow x \text{ read } z$

       $⟦\text{Bill and Susan}⟧ = \lambda g.\text{fold } g \boxed{\text{Bill, Susan}}$

    b. $\text{fmap } \lambda x.\text{read}(h(1))(x) \ \lambda g.\text{fold } g \boxed{\text{Bill, Susan}}$

       $= \lambda g.\text{fold } g \boxed{\text{read}(h(1))(\text{Bill}), \text{read}(h(1))(\text{Susan})}$

    c. $\text{fmap } 1 \ \lambda g.\text{fold } g \boxed{\text{read}(h(1))(\text{Bill}), \text{read}(h(1))(\text{Susan})}$

       $= \lambda g.\text{fold } g \boxed{\lambda z.\text{read}(z)(\text{Bill}), \lambda z.\text{read}(z)(\text{Susan})}$　　$\rightsquigarrow$ lambda abstraction

    d. $\text{fmap } ⟦\text{the}⟧ \ \lambda g.\text{fold } g \boxed{\lambda z.\text{read}(z)(\text{Bill}), \lambda z.\text{read}(z)(\text{Susan})}$　$\rightsquigarrow$ a silent $⟦\text{the}⟧$

       $= \lambda g.\text{fold } g \boxed{\iota z.\text{read}(z)(\text{Bill}), \iota z.\text{read}(z)(\text{Susan})}$　$\rightsquigarrow$ the presupposition of *same*

    e. $⟦\text{same}⟧_{⟨et⟩} \overset{\text{def}}{=} \bigcap_{x_i \in xs} P_{x_i}$

       $\because xs = \boxed{\iota z.\text{read}(z)(\text{Bill}), \iota z.\text{read}(z)(\text{Susan})}$

       $\therefore ⟦\text{same}⟧ = \lambda z.[\text{read}(z)(\text{Bill}) \wedge \text{read}(z)(\text{Susan})]$

       $⟦\text{the same book}⟧ = \lambda z.[\text{read}(z)(\text{Bill}) \wedge \text{read}(z)(\text{Susan}) \wedge \text{book}(z)]$

    f. $⟦\text{Bill and Susan read the same book}⟧$

       $\Leftrightarrow \text{fmap } ⟦\text{the same book}⟧ \ \lambda g.\text{fold } g \boxed{\iota z.\text{read}(z)(\text{Bill}), \iota z.\text{read}(z)(\text{Susan})}$

       When $g = \wedge$, this is equivalent to

       $[\lambda z.\text{read}(z)(\text{Bill}) \wedge \text{read}(z)(\text{Susan}) \wedge \text{book}(z)](\iota z.\text{read}(z)(\text{Bill}))$

       $\wedge[\lambda z.\text{read}(z)(\text{Bill}) \wedge \text{read}(z)(\text{Susan}) \wedge \text{book}(z)](\iota z.\text{read}(z)](\text{Susan}))$

       I.e., the contextually salient thing that Bill read has the properties of being a book and being read by Susan, while the contextually salient thing that Susan read has the properties of being a book and being read by Bill.

Right Node Raising cases can also be easily derived in the current analysis:

(37)　⟦Bill read and Susan reviewed the same paper⟧

    a. $⟦\text{Bill read}⟧ = \iota z.\text{read}(z)(\text{Bill}), ⟦\text{Susan reviewed}⟧ = \iota z.\text{reviewed}(z)(\text{Susan})$

    b. $⟦\text{Bill read and Susan reviewed}⟧ = \lambda g.\text{fold } g \boxed{\iota z.\text{read}(z)(\text{Bill}), \iota z.\text{reviewed}(z)(\text{Susan})}$

    c. $\because xs = \boxed{\iota z.\text{read}(z)(\text{Bill}), \iota z.\text{reviewed}(z)(\text{Susan})}$

       $\therefore ⟦\text{same}⟧ = \lambda z.[\text{read}(z)(\text{Bill}) \wedge \text{reviewed}(z)(\text{Susan})]$

       $⟦\text{the same paper}⟧ = \lambda z.[\text{read}(z)(\text{Bill}) \wedge \text{reviewed}(z)(\text{Susan}) \wedge \text{paper}(z)]$

    d. $⟦\text{Bill read and Susan reviewed the same paper}⟧$

       $\Leftrightarrow \text{fmap } ⟦\text{the same paper}⟧ \ \lambda g.\text{fold } g \boxed{\iota z.\text{read}(z)(\text{Bill}), \iota z.\text{reviewed}(z)(\text{Susan})}$

       When $g = \wedge$, this is equivalent to

       $[\lambda z.\text{read}(z)(\text{Bill}) \wedge \text{reviewed}(z)(\text{Susan}) \wedge \text{paper}(z)](\iota z.\text{read}(z)(\text{Bill}))$

       $\wedge[\lambda z.\text{read}(z)(\text{Bill}) \wedge \text{reviewed}(z)(\text{Susan}) \wedge \text{paper}(z)](\iota z.\text{reviewed}(z)](\text{Susan}))$

       I.e., the contextually salient thing that Bill read has the properties of being a paper and

being reviewed by Susan, while the contextually salient thing that Susan reviewed has the properties of being a paper and being read by Bill.

Having shown how to derive the list $\boxed{f(x), f(y), ...}$ from the list $\boxed{x, y, ...}$, now I show how to interpret DPs such as *the boys*, *two boys* and *every boy* as lists of atomic boys. As illustrated in (38), these DPs all license the use of internal *same*.

(38) a. <u>The boys</u> read the same book.   ✓ internal *same*
      b. <u>Two boys</u> read the same book.   ✓ internal *same*
      c. <u>Every boy</u> read the same book.   ✓ internal *same*

(39) $[\![\text{the}]\!] \overset{\text{def}}{=} \lambda P.[\lambda g.\text{fold } g \boxed{x_i \mid P(\oplus x_i)}_{\text{contextually-salient}}]$

$[\![\text{the boys}]\!]$ is interpreted as the contextually salient list of boys.

(40) $f_{\text{list-choice}} \overset{\text{def}}{=} \lambda P.[\lambda g.\text{fold } g \boxed{x_i \mid \text{Atom}(x_i) \wedge P(\oplus x_i)}_{\text{choice}}]$

$[\![\text{two boys}]\!] = \lambda X.[|X| = 2 \wedge \text{boys}(X)]$

$f_{\text{list-choice}}[\![\text{two boys}]\!]$ is interpreted as a certain list of boys and the length of the list is 2.

(41) $[\![\text{every}]\!] \overset{\text{def}}{=} \lambda P.[\lambda g.\text{fold } g \boxed{x_i \mid \text{Atom}(x_i) \wedge P(x_i)}_{\text{contextually-largest}}]$

$[\![\text{every boy}]\!]$ is interpreted as the contextually largest boy list, which contains all the boys.[8]

Given the definitions in (39) – (41), *the boys*, *two boys* and *every boy* can be interpreted as lists.[9] Notice that the usual interpretation of these DPs can be easily recovered from these lexical entries: in the cases of *the boys* and *two boys*, when $g = \oplus$, the sum reading of these DPs can be derived. For distributive reading sentences, fmap takes the job of building lists of larger constructions from lists of smaller units, and at the end, $g = \wedge$, making the whole list into a series of conjunctions.

Essentially, external *same* sentences such as (20a) can be analyzed in a very similar way. The only difference is that while for internal *same* readings, all the items involved in an identity relation are expressed within one and the same sentence, for external *same* readings, some items are from the context or previous utterances. In other words, for the external use of *same*, the antecedent of *same*, i.e., a list of individuals, needs to be accommodated from contexts.

---

[8]This treatment of the universal quantifier is similar to the analysis of Bumford (2015). The difference is that his analysis aims to account for the use of internal *different* (e.g., *every boy read a different book*): since the book one boy read determines what *different books* can mean for other boys, in Bumford (2015)'s analysis, the universal quantifier works in a sequential way in adding elements into a list. However, in the current analysis, which aims to account for internal *same*, whether element are added into a list sequentially or simultaneously makes no empirical difference.

[9]An additional requirement in licensing internal *same*: in (39) – (41), the length of lists should be at least 2.

6.3. The scope-taking behavior of *same*

According to Barker (2007), internal *same* is a scope-taking adjective: it follows its licenser in taking scope, and therefore, the scope of internal *same* is called 'parasitic scope'. As (42) illustrates, this sentence has two readings: (i) everyone > a group of three men; (ii) a group of three men > everyone. For each reading, the scope of *same* depends on the scope of its licenser, i.e., *three men*.

(42)   Everyone met three men with the same name.
    a.   There is a certain group composed of three men the names of which are the same, and everyone met this group of men.
    b.   Everyone is paired with a certain group composed of three men the names of which are the same, and everyone met the group paired with him or her.

In the current analysis, *same* is anaphoric, and thus it follows necessarily that the scope taking behavior of internal *same* would be similar to that of reflective pronouns (consider *Everyone wants a man$_i$ to recognitive himself$_i$*), i.e., internal *same* takes scope after its antecedent.

There is a difference between Barker (2007) and the current analysis. In Barker (2007), for the sentence (20b), the licenser of internal *same* is *Bill and Susan*, but in my analysis, the antecedent for *same* is 'the thing Bill read and the thing Susan read'. However, as (36) shows, this antecedent is built on the base of the coordination phrase *Bill and Susan*. Thus, empirically the current analysis and Barker (2007) are totally consistent on the scope taking behavior of internal *same*.

6.4. The island effects of *same*

As Carlson (1987) first points out, for internal *same*, 'the licensing NP must appear within the same scope domain as the dependent expression' (see (43)). In the current analysis, these island effects can be accounted for immediately. As shown in the derivation (36), the lambda abstraction in (36c) is essentially a wh-movement, which is subject to island constraints.

Notice that in the current analysis, this lambda abstraction is a crucial step for deriving a plurality (i.e., list) of contextually unique or most salient individuals that serve as the antecedent of *same*. In other words, the insertion of silent ⟦the⟧ in (36d) can be considered as a requirement of *same* (i.e., its presuppositional requirement), and this insertion in turn requires the lambda abstraction in (36c), thus the island effects are actually a necessary consequence of the semantics of *same*.

(43)   a. *Everyone knows why Mary read the same book.   *wh*-island
        b. *Everyone rejected the claim that Mary read the same book.   complex NP island

    c. *Everyone laughs when Mary reads the same book.   adjunct island

6.5. Why is it obligatory to use *the* before *same*?

So far, I have been treating the contribution of *the* before *same* as semantically vacuous. Here I propose that the use of *the* makes the interpretation of *same* as contextually salient as possible.

Notice that in the discussion in §3, the identity relation is essentially characterized as a mutual predication: i.e., for two things involved in an identity relation A and B, contextually salient properties of A (say P_A) hold for B and vice versa. However, if $P_A \sqcap P_B$ hold for both A and B, then for any P_A' such that $P_A \subset P_A'$ and any P_B' such that $P_B \subset P_B'$, it certainly follows that $P_A' \sqcap P_B'$ hold for both A and B. In fact, sentences such as *A and B are the same* can be interpreted in many ways, depending on context: A and B are exactly the same token; A and B are of the same kind; A and B can be two different copies of the same book; A and B can be the same car model but of different colors, etc.

Therefore, if we analyze *same* as the intersection of contextually salient properties of A and con-textually salient properties of B, a large number of resultant properties can be qualified as *same*. Thus, the semantic contribution of *the* is probably to pick out the contextually most salient property from this large set of properties. In other words, *the* contributes contextual salience. This use of *the* is actually reminiscent of the use of *the* in superlatives: any height that is larger than the height of the second tallest thing can be considered as tallest, and *the* can be considered as an operator that picks out the most salient height from this set of heights $\{h_i | h_i > h_{\text{the second tallest}}\}$.

7. Summary and outlook

In this paper, based on empirical evidence from attitude reports, I provide a new characterization for natural language identity relation: it is essentially a mutual predication. Based on this, I propose a new analysis for adjective *same*: *same* is anaphoric and it denotes an intersection of contextually salient properties coerced from each atomic individual involved in an identity relation.

There are a few open questions. How is *different* used in attitude reports? How does *same* interact with negation? Besides, can this new characterization of identity relation shed light on the study of *de se* attitude reports as well as reflexive pronouns? I leave these questions for future research.

References

Barker, C. (2007). Parasitic scope. *Linguistics & Philosophy 30*, 407 – 444.

Brasoveanu, A. (2011). Sentence-internal *different* as quantifier-internal anaphora. *Linguistics & Philosophy 34*(2), 93–168.

Bumford, D. (2015). Incremental quantification and the dynamics of pair-list phenomena. *Semantics & Pragmatics 8, Article 9*, 1–70.

Carlson, G. N. (1987). *Same* and *different*: Some consequences for syntax and semantics. *Linguistics and Philosophy 10*(4), 531–565.

Cumming, S. (2008). Variabilism. *The Philosophical Review 117*(4), 525 – 554.

Frege, G. (1892). Über Sinn und Bedeutung. *Zeitschrift für Philosophie und philosophische Kritik 100*, 25 – 50. Translated as 'On Sense and Reference' by M. Black in *Translations from the Philosophical Writings of Gottlob Frege*, P. Geach and M. Black (eds. and trans.), Oxford: Blackwell, third edition, 1980.

Hardt, D. and L. Mikkelsen (2015). Same but different. *Linguistics & Philosophy 38*, 289 –314.

Heim, I. (1985). Notes on Comparatives and Related Matters. Ms, University of Texas, Austin.

Kaplan, D. (1969). Quantifying in. *Synthese 19*(3–4), 178 – 214.

Kehler, A. (2002). *Coherence, reference, and the theory of grammar*. Stanford, CA: CSLI Publications.

Kubota, Y. and R. Levine (2015). The syntax-semantics interface of 'respective' predication: A unified analysis in Hybrid Type-Logical Categorial Grammar. *Natural Language & Linguistic Theory*, 1–63.

Lewis, D. (1979). Attitudes *De Dicto* and *De Se*. *The Philosophical Review 88*(4), 513 – 543.

McKay, T. and M. Nelson (2014). Propositional Attitude Reports (Spring 2014). In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*. http://plato.stanford.edu/entries/prop-attitude-reports/dere.html.

Mikkelsen, L. (2005). *Copular Clauses: Specification, Predication and Equation*. Amsterdam / Philadelphia: John Benjamins Publishing Company.

Percus, O. and Y. Sharvit (2014). Copular asymmetries in belief reports. Poster presented at *Semantics and Linguistics Theory* (SALT) 24.

Quine, W. V. (1956). Quantifiers and Propositional Attitudes. *Journal of Philosophy 53*(5), 177 – 187.

Solomon, M. (2009). The compositional semantics of *same*. www.semanticsarchive.net/Archive/DhhNTdmM/solomon-same.pdf.

Sudo, Y. (2014). On *De Re* Predicates. In R. E. Santana-LaBarge (Ed.), *Proceedings of the 31st West Coast Conference on Formal Linguistics*, pp. 447 – 456. Somerville, MA: Cascadilla Proceedings Project. www.lingref.com, document #3048.

Zhang, L. (2015). Decomposing English particles *and* and *or*. In T. Bui and D. Özyıldız (Eds.), *NELS 45: Proceedings of the 45th Annual Meeting of the North East Linguistics Society*, Volume 3, pp. 261 – 270.

Zhang, L. (2016). Motivating a Symmetric Copula *Be* in Attitude Reports. In S. Cho (Ed.), *U. Penn Working Papers in Linguistics*, Volume 22.1, pp. 313 – 322.