Semantics of the non-deictic uses of Mandarin Demonstratives

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Abstract. This paper presents novel data from Mandarin that can tease apart the two main analyses of demonstratives. (1) propose that demonstratives carry an anti-uniqueness presupposition, requiring there to be another entity meeting the NP description in the larger situation. The Hidden Argument Theory of demonstratives argue that demonstratives carry an additional restriction than a definite description. The Mandarin data I focus on involve demonstratives with restrictions that are so specific that anti-uniqueness cannot be met. By discussing this data, I show that an account of demonstratives based on situational anti-uniqueness is not sufficient. Then, I build an account of Mandarin demonstratives based on the main intuitions from the Hidden Argument Theory. Following (2), I argue that the second restriction must be a syntactic constituent. In explaining the restricted distribution of demonstratives, I follow (7) and (10) in arguing that there is a pragmatic competition. Finally, I extend Ahn's analysis and argue that proper names should be added to the inventory of expressions that can occupy the second argument position.

Keywords: Demonstratives · Definiteness · Semantics.

1 Introduction

Over the past three decades, scholars have argued that demonstratives have two general uses: a. they provide direct reference to specific individuals or objects following (9), which is called the deictic use of demonstratives, and involve direct pointing with gestures as shown in (1); b. they can also employ non-deictic uses (5; 1; 2; 7; 10), including the anaphoric uses and descriptive uses. The anaphoric use is shown in (2) to denote the familiarity of a previous expression. (11) particularly holds this view on Mandarin demonstratives. The descriptive use is shown in (3), where the demonstrative, restricted with descriptions, refers to a specific referent.

(1) (Pointing to a book) That is expensive.

(2) I met a linguist. That linguist looked happy. [(10):(13)]

(3) That guy who is walking to open the door is my brother.

In this paper, I will focus on the non-deitic uses in Mandarin demonstratives, like (2) and (3). Regarding the form of demonstratives, I will only discuss those 'complex demonstrative constructions' or 'descriptive demonstratives' in Mandarin, like (4), rather than the 'bare demonstratives' like 'that linguist' in (2), or 'demonstrative pronouns' like 'that' in (1). In Mandarin, demonstratives are lexically represented by *zhe* ('this') and *na* ('that'). To form a complex demonstrative construction, 'zhe' or 'na' is combined with a nominal phrase, 'CL(classifier)-NP' in Mandarin. The Mandarin gloss *'na ge-CL ren'* means 'that person' in English. The main Mandarin data discussed in this paper are shown in (4), where (4a) is a non-deictic use of a demonstrative with a relative clause, to denote that the speaker's brother is the one who walks to open the door; in (4b), a proper name followed by a demonstrative refers to the proper name itself.

(4) a. [zou guoqu kai men de **na ge ren**] jiu shi wo de gege
walk to open door DE that-CL-person then is I de brother
The person who walks to open the door is my brother.

b. [Zhangsan **na ge ren**] shuan le wo de xin
Zhangsan that-CL-person tie I DE heart
Zhangsan ties my heart.

I present my proposal in two parts – the first part compares the two main theories with the undergeneration problems of (1) and shows that the Hidden Argument Theory works better for Mandarin empirical data, and the second part discusses the possible undergeneration issues implementing (10) and gives a modification proposal. For non-deictic uses of demonstratives, we find two families of theories in the literature: a. on the first view, to explain the markedness of the demonstrative compared to the definite descriptions, the demonstrative is lexically restricted with an anti-uniqueness presupposition (1); b. the second view is the Hidden Argument Theory (HAT) ((5), (6), (7), (2), (10), *a.o.*), on which, the demonstrative takes two arguments instead of just one, and the second argument which is hidden (silent) restricts the demonstrative.

2 Empirical data from corpus

In this section I will introduce empirical data on Mandarin demonstratives of non-deictic uses. I use CnCorpus (http://corpus.zhonghuayuwen.org/) and BCC corpus (BLCU Corpus Center: http://bcc.blcu.edu.cn/) to collect data on demonstratives. I searched *'na ge ren'* ('that person') in the corpus and filtered the irrelevant or complicated data. The results of this search include demonstratives with relative clauses (RC) and proper names. Section 2.1 provides Mandarin demonstratives with relative clauses. Section 2.2 shows data of Mandarin demonstratives with proper names.

2.1 Non-deictic uses: Demonstratives with restrictive RC/modifier

(5) a. [zou guoqu kai men de **na ge ren**] jiu shi wo de gege
walk to open door DE that-CL-person then is I de brother
The person who walks to open the door is my brother.

b. [ta xin shang de **na ge ren**] wei ta chi le bu shao
she heart up DE that-CL-person for her ear PAR not little
ku
bitter
That person who she loves takes lots of pains for her.

c. rang [ni jia xiang song jidan de **na ge ren**] shuo ba
let you home village deliver egg DE that-CL-person say PAR
Let that person who delivers eggs in your hometown talk!

2.2 Non-deictic uses: Demonstratives identity to the preceding proper names

(6) a. [Zhangsan **na ge ren**] shuan le wo de xin
Zhangsan that-CL-person tie I DE heart
Zhangsan ties my heart.

b. wo bu renshi [Lisi **na ge ren**].
I not know Lisi that-CL-person.
I don't know Lisi.

3 The first theory: (1) and their undergeneration problems

As mentioned before, there are two general types of theories on the non-deictic uses of demonstratives: one holds the view that the demonstrative takes sole argument – it is the demonstrative itself that is restricted by a presupposition; the other argues that the demonstrative takes two arguments – it is the second hidden argument that conveys more information and semantically restricts the demonstrative. The first type of theory focuses more on the lexical restrictions on demonstratives, such as (1). They propose an account based on (12), by adding an anti-uniqueness presupposition to the demonstrative itself. Since (1) is the only theory which provides the full analysis on Mandarin demonstratives, I will begin with the discussions and evaluations of their theory.

3.1 (1): Demonstratives with situation-based anti-uniqueness presupposition

Dayal and Jiang first challenge (11)'s view of Mandarin demonstratives on which they are strong definites while bare nouns in Mandarin are weak definite. By providing empirical data to show that a. Mandarin demonstratives cannot always be used when familiarity exists; b. bare nouns can also be used as unique definites under the minimal context, they argue that the Mandarin demonstrative should be treated as an ordinary demonstrative. They give a unified analysis on Mandarin demonstratives based on (12), aligned with demonstratives cross-linguistically.
(1)'s formal semantic analysis of demonstratives is given in (7). For any demonstrative, it has an anti-uniqueness presupposition which requires a larger situation s', such that more than one entity satisfies the common noun property P in the larger situations s'. If the anti-uniqueness presupposition is satisfied, then it picks out the unique entity in the minimal situation s that satisfies two properties: the common noun property P and the intended referent property, which is represented by the free variable y.

(7) $Dem = \lambda s \lambda P : \exists s' s \leqslant s' | P_{s'} | > 1 . \iota x [P_s(x) \wedge x = y]$

3.2 (1)'s undergeneration problems in Mandarin demonstratives

In this subsection I will illustrate (1)'s demonstrative proposal on the non-deictic Mandarin demonstrative uses with relative clauses, and proper names. (1)'s anti-uniqueness presupposition requires a larger situation with more than one entity holding the noun properties. For the non-deictic uses of demonstrative when there is only one entity with the property in the minimal situation and no other entities holding the same property in the larger situations, it will predict that the demonstratives cannot be felicitously used, which disobey the empirical fact. I will use (5a) as the main example to discuss in this subsection, which is shown as (8) below.

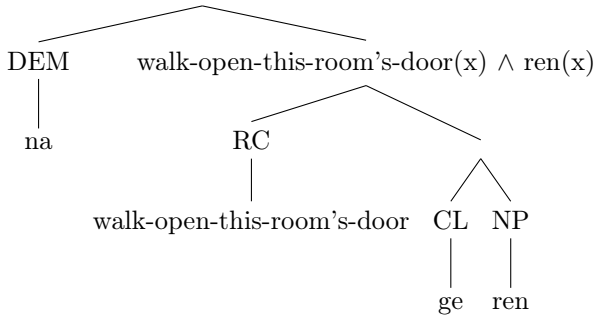
(8) zou guoqu kai men de **na ge ren** jiu shi wo de gege
walk to open door DE that-CL-person then is I de brother
The person who walks to open the door is my brother.

The issue arises when a relative clause is so specific that it cannot hold of any other entity in the larger situation. For the example in (8), suppose there are some individuals in the room (the number of the individuals in the room does not matter). With the descriptive sentence (8) uttered, the relative clause picks out one unique entity that walks up to open the specific door in the discourse context, where there cannot be anyone else in the larger situations walking up to open that specific room's door in the minimal context. There could be individuals in the larger situations holding the property of 'walking to open door', but not exactly the same door as the one in the minimal context, 'walking to open this room's door'.

There are two possibilities of treating the relative clauses under (1)'s approach. One is to say, the relative clause helps to pick out the entity thus should be treated inside the demonstrative construction, following the interpretation of (8) given above. The other is to treat the relative clause as a supplement to the demonstrative construction, where the relative clause does not provide any lexical restrictions to the demonstrative itself. With the discussion of the natural interpretation of (8) above, I first illustrate the analysis of (8) under (1)'s approach to treat the relative clause as being inside the noun properties, shown in (11). Since Dayal and Jiang do not provide a syntactic structure of demonstrative with relative clauses, I follow (3), (4) and (2)'s discussion of the syntax structure of Mandarin demonstratives with relative clauses, which will be discussed more below in section 4. They argue that there are two possible structures: relative clause initial structure or the demonstrative initial one. I adopt the demonstrative initial construction for the illustrations in (11), which directly captures the fact that the relative clause is treated as part of the noun property combining with the bare noun first.

(9) a. **[walk-to-open-this-room's-door DE that Cl person]**

b. ιx.[walk-open-this-room's-door(x) $\wedge$ ren(x)]



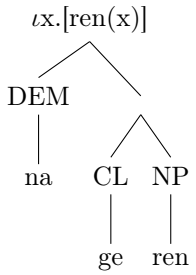
c. (1) dem = $\lambda P.\lambda s.\exists s' s \leq s' | P_{s'} | > 1.\iota x[P_s(x) \wedge x = y]$; *(D&J's proposal)*
(2) P = walk-to-open-this-room-door DE CL person;
(3) $walk-to-open-this-room-doorDEthatClperson$
$= \lambda s.\exists s' s \leq s' | walk-open-this-room-door-person_{s'} | > 1.\iota x[walk-open-this-room-door-person_s(x) \wedge x = y]$

Following the proposal of (1) in (11c.1), the anti-uniqueness presupposition requires that there should be other individuals satisfying the property of walking to open the specific room's door, while in the minimal context of (8), there is only one individual opening this specific door. Thus under the analysis of (11c.3), (8) should not be acceptable, contrary to fact.

In order to avoid (1)'s anti-presupposition problem, one possible alternative analysis could be to treat the relative clauses as supplementary and non-restrictive. Since non-restrictive relative clauses are often analyzed to be interpreted outside the DP, we can maintain that only the noun is a restriction property to iota,

and of course there will be other people in the larger situation, thus meeting the presupposition. The semantic analysis is illustrated below in (10).

(10) a. walk-to-open-door DE **[that Cl person]**

b. 

c. (1) $that = \lambda P.\lambda s.\exists s' s \leq s' | P_{s'} | > 1.\iota x[P_s(x) \wedge x = y]$; *(D&J's proposal)*
(2) P = person;
(3) $thatClperson = \lambda s.\exists s' s \leq s' | person_{s'} | > 1.\iota x[person_s(x) \wedge x = y]$

Given this analysis, only the bare noun 'person' could satisfy the property P, with no lexical meanings contributed by the general classifier 'ge'. The construction 'that-CL-person' denotes a singular individual in the minimal situation, with the presupposition met. However, this interpretation is infelicitous as the demonstrative now is simply denoting an individual. With the external relative clause being a separate sentence following the single individual, the relative clause is behaving like a supplement and cannot help to restrict the demonstrative to denote the unique individual. Moreover, the intended referent property, the free variable y also lies inside the iota expressions and is not connected with the external relative clause, and therefore cannot help to restrict the denotation of the demonstrative. Again, suppose that in the minimal context there are some people in the room and the speaker A and the hearer B are outside the room talking to each other. With the relative clause supplementary to the demonstrative use 'that person', the receiver B cannot tell which person is the speaker's brother in the room. To show the supplementary treatment, the original demonstrative construction with relative sentence could be rephrased to be two separate sentences, where the relative sentence is now following the demonstrative-BN (bare noun) to be supplementary: *'That person is my brother. (A pause). He is walking to open the door.'* Here the demonstrative use is not quite felicitous as people cannot tell which one is the speaker's brother, even though later they will get the supplements of more descriptions. With the demonstrative-BN and the supplementary clause separately, the denotation of the demonstrative part still faces problems, since the supplementary clause can only help later on descriptions but not help when the demonstrative selects references.

This reference failure of the demonstrative with relative clause shows that even though treating RC outside the bare noun property meets (1)'s anti-uniqueness presupposition, it is still not acceptable to treat RC as a non-restrictive supplement outside the bare noun property of the demonstrative to successfully denote

the correct entity.

So far, we have seen how (1)'s proposal cannot extend to account for the data of Mandarin demonstratives with a relative clause being specific in the minimal context like (10). Similarly, the demonstrative data with proper names will also be an undergeneration problem to (1). In a given context where the individual's proper name is unique, there cannot be other individuals holding the same proper name in the larger situations, as there is only one individual holding his/her name property in the minimal situation.

To summarize this section, Dayal & Jiang's analysis of Mandarin complex demonstratives have undergeneration problems in their anti-uniqueness presupposition for the non-deictic uses of Mandarin demonstratives with relative clauses and proper names. When the relative clause or proper name is too restrictive, there can only be one entity having the property in the minimal situation, which cannot satisfy the anti-uniqueness requirement in the larger situations. The alternative way to treat RC as a non-restrictive supplement still fails to contain enough information to capture the correct denotation of the complex demonstrative construction, and therefore is still a problem.

4 The alternative theory: Hidden Argument Theory

Hidden Argument Theory is first proposed by (5) and (6). (5) argues that the demonstrative 'that' should take two arguments to make a generalized quantifier. (6) also treats 'that' with two arguments, but the demonstrative will return the unique entity that satisfies both properties rather than a generalized quantifier. Their proposal is given in (11), where the second argument G(x) corresponds to the identificational property. This second argument G is covert, while the first argument F is overt to the material.

(11) that F = the x: [F(x) & G(x)]

4.1 Apply (2) on Mandarin data in section 2

Hidden Argument Theory can better capture the data in section 2 for Mandarin demonstrative constructions with relative clauses and proper names. As discussed above, the demonstrative takes two arguments under HAT: the first argument is overt as the predicates, while the second argument can be covert as the identificational property, or be overt represented as the relative clause or the modifier. With the overt restrictive second argument, the demonstrative carries more information and can provide the position to the relative clause or proper names, rather than being lexical restrictive itself like (1). For (1), with the restriction property added by the relative clause or the proper name, the anti-uniqueness presupposition of the demonstrative cannot always be satisfied. However, with the second hidden argument added as a syntactic constituent, the

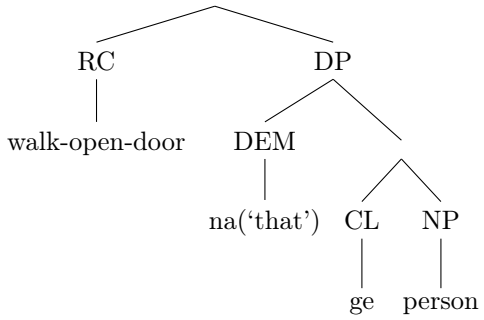
hidden argument can directly capture the semantic restriction on the demonstrative, which I will use the data from section 2 to show that the relative clause and the proper name will be illustrated in the second argument. Following Nowak's presupposition account, this second argument should semantically restrict the first argument. I will first show the illustrations of the non-deictic cases of demonstratives with RC, with the examples (5a) and (5c) from section 2. Following that, for the non-deictic cases of 'proper name-demonstrative' construction, I give the analysis with an example of (6a). The syntax structure given below follows (2)'s analysis, to treat the relative clause or modifiers higher as a separate second property and the demonstrative combines with the NP first.

Descriptive cases with relative clauses

(12) a. **[walk-to-open-door DE that Cl person]**

b. walk-to-open-door DE that Cl person =
λx. the intersection of x : person(x) = 1 and x : walk-open-door(x) = 1 is a proper subset of x : person (x) = 1. ιx : walk-open-door(x) & person(x) = 1

c. ιx.[walk-open-door(x) $\wedge$ person(x)]



This is acceptable non-deictic data for demonstratives. In this structure, 'that' finds both of the arguments it requires in the syntax; 'ren' saturates one argument place, and 'walk-open-door' saturates the second. To compute the extension of the string, we start by checking to see that it satisfies our restriction presupposition. Since there are guys who do not walk to open the door, the expression 'walk to open the door' is a restrictor on 'person', according to our definition, which means the derivation can proceed. Then we apply the whole representation:

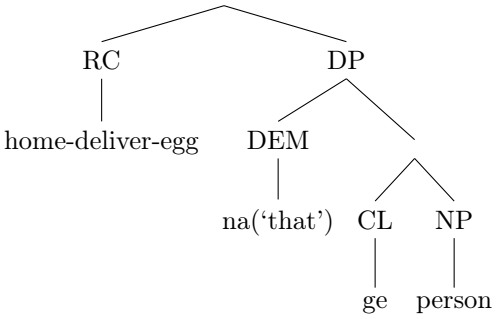
(13) the x: [person(x) & walk-open-door(x)]

Similarly, the analysis of example (5c) is shown as below in (14).

(14) a. let you home village deliver egg DE that CL person talk

b. the x: [person(x)&home-deliver-egg(x)]

c. ιx.[home-deliver-egg(x) $\wedge$ person(x)]

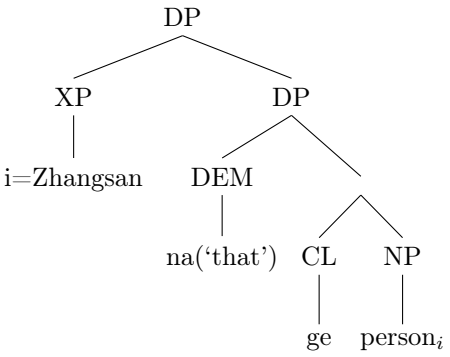


Demonstratives identity to the proper name In the non-deictic complex demonstrative examples like (6a), the preceding proper name is an identity function which denotes the unique definite saturating the second argument. So the property of being the proper name like 'Zhangsan' is a restrictor of being a 'person'. The restriction condition is met. With the assignment function which maps the index *'i'* to Zhangsan, the analysis is given in (15).

(15) a. Zhangsan that Cl person ties my heart

b. the x: [person(x)=identical-to-Zhangsan(x)]

c.



5 Comparing (1) and (2)

Comparing (1) with (2)'s modified Hidden Argument Theory, I conclude that both (1) and (2) fundamentally argue the demonstrative is a semantic operation which restricts a larger set to a subset with the anti-uniqueness presupposition, by either adding the presupposition to the lexical demonstrative itself that there are always more than one noun properties p in the larger situations, or by adding the presupposition into the relationship between the two arguments such that the second overt argument of the demonstrative should restrict the first covert argument. These two theories for demonstratives both directly introduce the

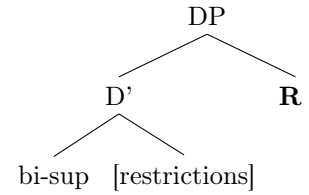
non-redundancy condition as a presupposition to the interpretations of demonstratives. They share the similarities that both are presupposition accounts.

Specifically, (1)'s proposal requires two properties for the entity x, the common noun property P and the intended referent y, which seems similar to the two arguments requirement of Hidden Argument Theory. The intended referent variable y of (1)'s proposal, can be compared with the second hidden argument of (2). (5), (6), and (2) all give the clear definitions on the second hidden argument, such that it is the identificational property and can be covert or overt as a modifier or a relative clause. (2) also defines the restriction relation between the second hidden argument and the first argument. (1) does not focus on the intended referent y in the examples, which they discuss more on the bare demonstrative examples like *'that boy'*. The intended referent is defined as a free variable, and there are no other restrictions on y given in their formal interpretation of the demonstrative. For the application in the complex demonstratives, with the requirement of 'x=y', the semantic type of y should also be the definite type of x, thus y cannot be represented overtly as a predicate like the relative clause or the modifier compared with the definition of the second hidden argument of (2). The two 'second' properties are different by definition: for (1), the intended referent is a free variable of a entity without representations; while for (2), the hidden second argument is a predicate property and can be overtly represented as modifiers or relative clauses.
The advantage of the Hidden Argument Theory is that, with the second argument of the demonstrative presented, Hidden Argument Theory can capture different uses of demonstrative constructions with the second argument overt being relative clauses or other restrictive modifiers, or covert being contextual saturation. D&J's demonstrative proposal cannot capture the non-deictic uses when the other parts of the demonstrative constructions being too restrictive.

6 Apply (10)'s Indirect Direct Account and its limitations

(10) proposes a mixed account based on the indirect approach 'Hidden Argument Theory' following (2)'s framework which treats the demonstrative as a definite expression with an additional argument, and adds the direct reference property to the additional argument.

(16)



(17) bi-sup= $\lambda P.\lambda R.\iota x : \forall y[P(y) \wedge R(y) \leftrightarrow y \sqsubseteq x]$

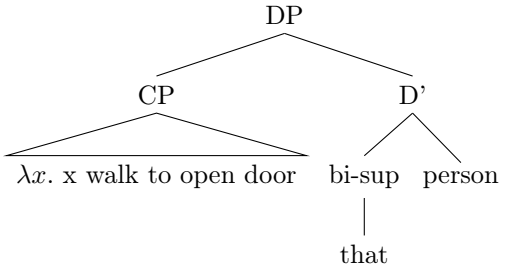
According to (10), the 'bi-sup' is the binary maximality operator, which extends from the 'supremum' operator taking the restrictions and returning the entity

which satisfies all the restrictions. The bi-sup operator also takes the additional restriction, which is marked as the bold 'R' representing restrictions, same as (2)'s second hidden argument G(x), which stands higher outside the D' headed by the demonstrative. Instead of following the traditional view that deixis returns the individual via the assignment function, Ahn suggests that the deictic pointing gesture is a predicate like the modifiers 'tall' which predicates over the individual. This pointing gesture as well as the anaphoric index and a relative clause can become the 'R' properties.
I will show that (10)'s proposal can account for the data of Mandarin demonstratives with relative clauses, but not with proper names, since the second argument can only be index, RC, and the pointing gesture. I first illustrate the descriptive cases with relative clauses in (18), with the example of (5a).

(18) a. **[walk-to-open-door DE that Cl person]**

b. walk-to-open-door DE that Cl person=
$bi{-}sup(\lambda x.person(x))(\lambda x.WOD(x))$'The maximal entity that walk to open door')

c.

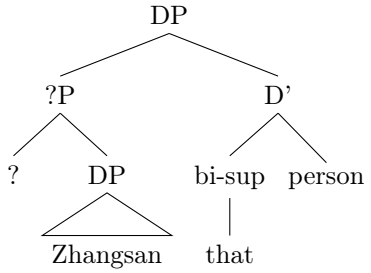


Ahn's proposal can capture the relative clause case of Mandarin demonstrative as expected. The relative clause fits perfectly in the position of R to the demonstrative construction. According to the previous discussions on the syntax of Mandarin relative clauses following (3), (4) and (2), the second argument can be located preceding the first argument, as shown in (18c), which follows the correct word order of Mandarin demonstrative with relative clause case.
For the demonstratives with proper name, the illustration is given below in (19).

(19) a. **[Zhangsan that Cl person]**

b. Zhangsan$_i$ that Cl person=
$bi{-}sup(\lambda x.person(x))(\lambda x.i(x))$'The maximal entity that takes the index i')

c.



However, Ahn's R set cannot satisfy the property of proper names in the demonstrative constructions. The proper name *'Zhangsan'* in (5) can **not** be treated as an RC, **nor** the anaphoric index, **nor** the gestures. I adopt (11)'s view on the properties of restrictions on demonstratives, such that the directly referential use of **proper names** is parallel to the anaphoric index, which seems cannot be accounted for by Ahn's R set. Mandarin example in (3) indicates that proper names should be added to the R set. Following (11), proper names, pronouns, and the index should all be treated as the domain restrictions of the anaphoric definite ι^x – the Mandarin demonstrative. This hypothesis is also supported by some specific uses of English demonstratives. As shown in (20), the demonstrative with the proper name is felicitous to be used with some emotive effects, although the proper name is unique in the minimal situation.

(20) **English data** [$_{PN}$That John] walks to open the door.

(21) My modified version of **R**: **R** = {index, RC, pointing gestures, **proper names**}

(22) a. [$_{DP}$[**R** : Zhangsan][$_{D'}$[bi-sup *na*][[$_{CL}$*ge*][$_{NP}$*ren*('*person*')]]]]

b. Zhangsan that Cl person
= bi-sup(λx. person(x))(λx. Zhangsan(x))
= $\iota x : \forall y[\mathsf{person}(y) \wedge \mathsf{Zhangsan}(y) \leftrightarrow y \sqsubseteq x]$
'The maximal entity that takes the proper name *Zhangsan* as a person'

7 Conclusion

In this paper, I discussed the previous views on demonstratives with comparisons by providing empirical data of non-deictic uses of Mandarin demonstratives, including demonstratives with relative clauses and proper names. (1)'s situation-based anti-uniqueness presupposition account undergenerates cases where the RC or the proper name is too specific such that there is only one unique entity in all the possible worlds; for those cases I showed that Hidden Argument Theory is better suited by implementing (2) and the pragmatic account (10). Then, with the illustrations of the data from section 2, I showed that Ahn's proposal works out for Mandarin demonstratives with RC, where RC belongs to the set of R properties, but not with proper names. Following (11), I then proposed to add the proper name into the lexical category of the second argument R set.

Acknowledgements I would like to thank my committee members Dr. Dorothy Ahn, Dr. Simon Charlow and Dr. Michael Glanzberg for the exceptional advising and guidance through this work.

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