More than that: demonstratives denoting kinds

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1 Introduction

[1] While there is extensive work on demonstratives and kind formation, little attention has been given to kind expressions formed by demonstratives. This paper explores demonstratives in Xi'anese, a Chinese variety spoken in the Guanzhong region of Shaanxi. Xi'anese is a classifier language as per Jiang (2012) in which both count and mass nouns require classifiers when combined with numerals. It shares basic properties with Mandarin, such as head-initial and SVO. Xi'anese comprises two subgroups: the Dongfu dialect and the Xifu dialect. The data in this paper is from the Dongfu dialect, mainly spoken in the urban area of Xi'an.

The paper focuses on demonstratives in a non-canonical structure in Xi'anese to investigate their ability to denote kinds. Xi'anese has two distal demonstratives, *uei* and *uo*, both of which can appear in the structure where a numeral precedes a demonstrative (Numeral-demonstrative phrases, 'NDP'), as exemplified below. The NDP with *uei* yields a kind-based reading as in (1), whereas the NDP with *uo* can give rise to three distinct interpretations: a kind reading, a typical definite reading and a partitive reading as in (2).

(1) nge xiang iao [san ge uei ge uan].
I want ask three CL that CL bowl
'I want three bowls of that kind.' *kind*

(2) nge xiang iao [san ge uo uan].
I want ask three $CL_{individual}$ that bowl
a. 'I want three bowls of that kind.' *kind*
b. 'I want those three bowls.' *definite*
c. 'I want three of those bowls.' *partitive*

While the definite and partitive readings of the NDP with *uo* can be readily accounted for

[1] Abbreviations in glosses: ASP – aspect; CL – classifier; $CL_{individual}$ – individual classifiers; CL_{mass} – mass classifiers; CL_{kind} – kind classifiers; SFP – sentence final particle.

given previous accounts, the kind reading of the NDP with both *uo* and *uei* is unexpected. Demonstratives are traditionally viewed as rigid and object-denoting (Kaplan 1989). Even non-rigid demonstratives are typically analyzed as object-denoting and definite-like. This paper argues that the kind-denoting *uei*, in particular, functions as a genuine demonstrative rather than a definite determiner, ruling out a definite-based analysis.

Although previous studies have observed kind-referring demonstratives, they provide only brief discussions and lack a formal analysis (Chierchia 1997, Krifka et al. 1995, Dayal 2004). This work bridges the gap by proposing a formal account of kind-denoting demonstratives, building on analyses of deferred reference (Nunberg 1993) and similarity (Umbach and Gust 2014).

First, I argue, based on novel observations in Xi'anese and English, that demonstratives can form kind expressions by imposing additional restrictions on the taxonomic hierarchy or establishing a connection between a kind and its instantiations. Second, I show that *uo* and *uei* are canonical demonstratives, passing the diagnostics in Ahn (2022). To account for the three interpretations of NDPs, I propose that the kind reading arises from a kind-referring demonstrative, while the definite and partitive readings result from a standard deictic demonstrative through different mechanisms. Specifically, the pre-demonstrative numeral adds a non-at-issue meaning (Potts 2005, Simons et al. 2011, Tonhauser et al. 2013, Gutzmann and McCready 2014, Potts 2015, Ebert et al. 2020) for the definite reading. For the partitive reading, I suggest that a null partitive operator applies to the demonstrative phrase before a numeral is composed, supported by the parallel with Multiple-classifier constructions (MCC) (Liao and Wang 2011). The non-canonical word order of NDPs emerges as a by-product of the semantic interactions among pre-nominal modifiers.

The goals of this paper are: (i) to account for the semantics of the numeral-demonstrative phrase, and (ii) to deepen the understanding of demonstratives and kind formation. The remainder of the paper is organized as follows: Section 2 provides a brief overview of demonstratives and kinds. Section 3 presents novel evidence from Xi'anese and English, arguing that demonstratives can form kind meanings and providing an analysis of kind-denoting demonstratives. Section 4 introduces the nominal structure of Xi'anese and examines the distinct interpretations of the numeral-demonstrative phrase. Section 5 concludes.

2 Background on demonstratives and kinds

I will briefly discuss previous research on demonstratives and kinds, and introduce new data to show that demonstratives can form kind expressions.

2.1 Demonstratives

The use of demonstratives is traditionally categorized into two main types: deictic and non-deictic. Deictic demonstratives exhibit rigid and direct reference (Kaplan 1989), identifying an entity through demonstration, such as a pointing gesture. For example, the demonstrative in (3) picks out a specific cake that is being pointed at within the context of utterance.

(3) I want **that cake** (while pointing at a cake).

On the other hand, non-deictic demonstratives don't require reference rigidity. A foundational work of this line is King (2001), which treats demonstratives as definite expressions composed of two arguments: one overt, supplied by the nominal predicate, and one covert, filled by contextual information. King (2001) discusses two types of non-deictic demonstratives. The first, known as 'no demonstration, no speaker reference (NDNS)', refers to cases where the demonstrative expression denotes any individual that fits the description without a fixed referent, as in (4a). The second, called 'quantifying-in (QI)', involves a demonstrative which is bound by a quantifier, thus lacking direct reference, as in (4b).

(4) a. That hominid who discovered how to start fires was a genius. [NDNS]
b. Every father dreads that moment when his oldest child leaves home. [QI]
(King 2001; ex. 3-4)

The distinction between the deictic and non-deictic uses results from the covert argument. In the deictic use, the covert argument is often filled with pointing which uniquely identifies an entity. In the non-deictic use, the covert argument involves a trivial property, making the demonstrative semantically equivalent to a definite description.

Traditional analyses, such as the hidden argument hypothesis, don't consider the possibility of demonstratives being kind-denoting. Instead, they emphasize their role in *de re* readings and direct reference. Even extended analyses, such as Ahn (2022), analyze demonstratives accompanying pointing as rigid and object-denoting, not kind-denoting.

However, empirical evidence suggests that demonstratives can denote kinds. For example, in (5), given the mismatch between the number of actual dolphins and the expression *those dolphins*, the phrase is more likely to denote the dolphin kind rather than a specific group of individual dolphins.

(5) [There are two dolphins in front of the speaker.]
I saw three of those dolphins before.

Similarly, in (6), the fact that *those lions* is compatible with a kind-level predicate *extinct*, indicates that it refers to the lion kind not the lion individuals.

(6) Those lions are going to be extinct.

2.2 Kinds

Common nouns can denote properties at the individual and kind levels (Krifka et al. 1995, Dayal 2004). Kinds are generally considered as the totality of all instantiations of a category that share distinct properties (Carlson 1977), distinguishing them from other categories. A kind is neither a particular object nor a specific group of objects but rather the kind itself—an entity of type *e* at the kind level (Krifka et al. 1995, Jiang 2012). For example, the DP *the potato* in (7a) doesn't refer to a specific object potato or instances of the kind but to the kind itself, POTATO. In contrast, *the potato* in (7b) refers to a specific object potato on the plate.

(7) a. The potato was first cultivated in South America. (Krifka et al. 1995; ex. 1a)
b. He ate the potato on the yellow plate.

Krifka et al. (1995) further classify kind-denoting terms into two groups: non-taxonomic and taxonomic. Non-taxonomic kinds refer to well-established kinds, while taxonomic kinds denote subkinds of a kind.

2.2.1 Non-taxonomic kinds

Non-taxonomic kinds typically refer to well-established kinds which are not compositional (Krifka et al. 1995). For example, since *the weak cockroach* is not a well-established kind, the sentence in (8a) is infelicitous. However, (8b) is felicitous because *the dodo* is a well-established kind.

(8) a. #The weak cockroach will be extinct.
b. The dodo is extinct.

Much of the literature on kind formation focuses on bare nominals and descriptions with (in)definite determiners. Bare nominals can refer to kinds in languages lacking determiners, such as Hindi, Russian and Chinese (Dayal 2004). They are compatible with both kind-level and object-level predicates. For example, *gou* 'dog' in (9a) is a kind term with a kind-level predicate, whereas it can serve as a definite description with an object-level predicate in (9b).

(9) Mandarin Chinese

a. gou juezhong le.
dog extinct SFP
'Dogs are extinct.'

b. gou hen jiling.
dog very smart
'The dogs/ Dogs are intelligent.'

In languages with determiners, a distinction arises between singular and plural/mass nouns. Singulars always come with a definite determiner to denote kinds, while plurals/mass may vary between bare and determiner-marked forms cross-linguistically.

In English, the definite singular *the dinosaur* can occur with a kind-level predicate in (10), while a bare singular is ungrammatical.

(10) The dinosaur/ *Dinosaur is extinct.

Indefinite singulars can introduce novel kinds. In (11), *a pumpkin crusher* denotes a novel kind, given that it appears with the kind-level predicate *invent*.

(11) This morning Fred invented a pumpkin crusher.

Bare plurals and mass nouns can also denote kinds. In (12b), the ungrammaticality of *the* indicates that mass nouns must be bare when denoting kinds.

(12) a. Dogs are extinct.
b. (*The) water is becoming scarce.

In contrast, in Italian, a definite determiner is always required to denote kinds, while in German, both definite and bare forms are grammatical for kinds.

(13) a. I cani/ *cani sono diffusi. (Italian)
the dogs/ dogs are widespread

b. Die Pandabären/ Pandabären sind vom Aussterben bedroht. (German)
the pandas/ pandas are facing extinction

2.2.2 Taxonomic kinds

Taxonomic kind-referring terms denote subkinds of a kind. For example, *this whale* in (14c) refers to a subspecies of whales (e.g., the blue whale) rather than the maximal whale kind. Similarly, the different subkinds of whales can also be expressed by the indefinite singular *a whale* in (14a), the bare plural *whales* in (14b), and the quantified phrases *two*

whales in (14d) and *every whale* in (14e).

(14) a. The dolphin is a whale.
b. The dolphin and the porpoise are whales.
c. This whale, namely the blue whale, is nearly extinct.
d. Two whales, namely the blue whale and the fin whale, were put under protection.
e. Every whale (from the pygmy whale to the blue whale) is protected by law (Krifka et al. 1995; ex. 114)

2.2.3 Kind formation: previous accounts

To derive kind-level meanings, Dayal (2004) and Sağ (2022) propose that a taxonomic predicate (e.g., LION) can denote both the unique lion kind and the subkinds of lions, as each is a taxonomic individual within the hierarchy. The level of the taxonomic hierarchy is determined by context. taxonomic predicate can form a kind expression either by combining with a definite determiner or by being type-shifted via the $\cap$ operator.

While previous accounts of kind-denoting expressions focus on definite determiners, data from (5) and (6) indicates that demonstratives can also generate kind interpretations. Further evidence is found in Krifka et al. (1995), repeated below.

(15) This whale, namely the blue whale, is nearly extinct.
(Krifka et al. 1995; ex. 114e)

Although demonstratives have been observed to allow kind-referring readings, how this reading is derived remains largely unexplained. Key works on kinds, such as Dayal (2004) and Sağ (2022), do not address demonstratives in their analyses. Even studies that acknowledge the kind-referring potential of demonstratives (Chierchia 1997, Krifka et al. 1995, Nunberg 1993) don't investigate whether these demonstratives are genuinely exophoric or function more like definite determiners. This gap in the literature raises critical questions: How can a demonstrative derive a kind reading? Are these readings compatible with existing analyses of demonstratives, or do they require a rethinking of traditional accounts? Addressing these issues is crucial for both accounting for the empirical data and deepening our understanding of how demonstratives interact with kind formation and contribute to the broader semantics of nominal expressions.

In the following sections, I will show that kind-denoting demonstratives are genuine demonstratives and how they produce kind interpretations.

3 Kind-denoting demonstrative expressions

3.1 Demonstratives as restrictors on the taxonomic domain

Previous literature has identified that the level of the taxonomic hierarchy is contextually determined (Dayal 2004, Sağ 2022). However, I argue that certain determiners–such as demonstratives, numerals and quantifiers–can also add restrictions to the quantification domain, thereby allowing access to subkind levels in the taxonomic hierarchy.

For instance, in (16), LION is a taxonomic predicate. The numeral *one* and the quantifier *every* require the existence of taxonomic individuals in the quantification domain of LION that can be quantified over. Since the singular kind individual is an atomic entity that lacks accessible members (Dayal 2004), *every* can't quantify over the kind at the top level. The only available option is to quantify over the taxonomic individuals at the subkind level.

(16) One/ Every lion is extinct.

Similarly, demonstratives can access subkind individuals, imposing additional restrictions at the kind level as they do at the object level. At the object level, the two occurrences of *that lion* with pointing can refer to different object-level individuals in (17b), while the DPs with a definite determiner in (17a) fail to do so and can only refer to the same individual in the context. The arrow $\rightarrow$ is notated for pointing and lowercase subscripts for object-level individuals.

(17) *object*

a. #[The lion]$_{\text{i}}$ is cute. [The lion]$_{\text{j}}$ is also cute.

b. [That lion]$_{\rightarrow a}$ is cute. [That lion]$_{\rightarrow b}$ is also cute.

At the kind level, *that* LION can refer to different subkinds of lions, whereas the singular definite can only refer to same maximal kind. This is possible only if the pointing accompanying *that* LION functions as a domain restriction, distinguishing between different subkinds of lions. The lowercase subscripts marks the pointed lion individuals–instances of a kind, whereas the uppercase LION represents the properties of subkinds.

(18) *kind*

a. #[The LION]$_{\rightarrow a}$ is going to be extinct. [The LION]$_{\rightarrow b}$ is also going to be extinct.

b. [That LION]$_{\rightarrow a}$ is going to be extinct. [That LION]$_{\rightarrow b}$ is also going to be extinct.

Seemingly, the English *that* could be argued to be definite-like in the kind-denoting ex-

amples above. For example, *that lion* in (18b) can be analyzed in the Dayal style, where a taxonomic predicate combines with a definite-like demonstrative, and the taxonomic noun contributes the kind flavor to the interpretation of the demonstrative phrase.

However, in the next section, I will demonstrate that Xi'anese *uei*, which requires pointing and is strictly exophoric, can indeed denote kinds.

3.2 Xi'anese demonstratives

In Xi'anese, where definite determiners are absent, demonstratives are frequently used with a proximal-distal contrast. Unlike numerals, they don't always require a classifier when combined with a noun. For instance, of the two distal demonstratives, *uo* and *uei*, only the latter requires a classifier.

(19) Mingming ba chufang uei *(tiao)/ uo iu chi-lie.
mingming BA kitchen that $CL_{individual}$/ that fish eat ASP
'Mingming ate that fish in the kitchen.'

I apply the diagnostics in Ahn (2017) to examine the properties of *uo* and *uei*.

First, only *uo* can denote uniqueness, as it can occur in both the immediate situation and global situations. The unstressed *uo* appears mostly in the non-familiar context, suggesting that *uo* functions primarily as a true demonstrative but can be definite-like in certain contexts when it is unstressed. The stressed *uo* is in boldface.

In contrast, *uei* is not allowed in either the immediate or global situation, indicating that it cannot act as a uniqueness-denoting definite determiner.

(20) *uniqueness*

a. ni beizi zai (uo)/ #uei ge caji shang ni.
you cup be that $CL_{individual}$ tea table on SFP
'Your cup is on the tea table.' *the immediate situation*

b. (uo)/ #uei ge yueliang zhen liang.
that $CL_{individual}$ moon very bright
'The moon is very bright.' *the global situation*

Second, both of them can be used anaphorically.

(21) *anaphoric*

a. Mingming iang-lie yi zhi mao he yi tiao gou. nge ke
Mingming raise-ASP one $CL_{individual}$ cat and one $CL_{individual}$ dog I very
xihuan *(**uo**/uei ge) gou lie.
like that $CL_{individual}$ dog SFP

'Mingming has a cat and a dog. I like that dog very much.'

b. zai mei ge fangzi litou you yi ba yuesi, ni yao ba
in every $CL_{individual}$ room inside have one $CL_{individual}$ key you need BA
*(**uo**/uei ba) yuesi na chulai.
that $CL_{individual}$ key take out
'In every room in which there is a key, you need to take out the key.'

Last, both *uo* and *uei* can have an exophoric use, referring to entities in the speech context.

(22) *exophoric*

a. nge iao **uo**/ uei ge mingxinpian. [There are many postcards on
I want that $CL_{individual}$ postcard
the wall.]

'I want that postcard.'

b. kuai kan **uo**/ uei ge mao! [The hearer is not aware of the cat.]
quick look that $CL_{individual}$ cat
'Look that cat!'

Both *uo* and *uei* can compose with taxonomic and individual predicates. When composed with a taxonomic predicate, the unstressed *uo* denotes the entire kind, while the stressed *uo* denotes a subkind. Since there is no panda subkind, *uo* is unstressed and definite-like, and refers to the panda kind in (23a). Given that the bare noun can also denote kinds, *uo* is optional in this case as expected. However, the stressed *uo* in (23b) behaves as a true demonstrative which restricts the quantification domain and denotes a specific subkind of dogs.

(23) a. (uo) xiongmao iao juezhong-lie.
that panda will extinct-ASP
'The panda will be extinct.'

b. **uo** gou iao juezhong-lie.
that dog will extinct-ASP
'That kind of dog will be extinct.'

Another evidence for the kind reading of *uo* comes from fragment answers. In the question in (24), the speaker asks what kind of fish was bought, targeting a kind-level interpretation. Both *heiyu* 'snakehead fish' and *uo iu* 'that fish' are acceptable answers, suggesting that they share a similar reading.

The classifier *tiao*, an individual classifier (ICL), combines with a set of (non-)atomic individuals (Chierchia 1998, Jenks 2018). This suggests that the bare noun *heiyu* 'snake-

head fish', when combined with *tiao*, denotes a set of fish of the snakehead kind, rather than a specific individual fish. The fact that *uo iu* is also a valid fragment answer indicates that it must similarly denote a set of fish of a specific kind, rather than a single individual.

I argue that *uo fish* denotes a newly formed subkind of fish before combining with a classifier. Its predicative reading in the full sentential answer is a by-product of the solution to the type-mismatch between the kind individual and the predicate-taking classifier. Thus, the fragment *uo iu* provides additional evidence for kind-referring demonstratives.

(24) a. ni mai-lie san tiao sa iu?
you buy-ASP three ICL what fish
'What kind of fish did you buy such that you bought three of it?'

b. heiyu.
snakehead fish

c. uo iu.
that fish

Unlike *uo*, *uei* is restricted to anaphoric and exophoric uses which qualify it as a genuine demonstrative. However, it can still denote kinds. The classifier *ge* in Xi'anese is semantically bleached. It can atomize the predicate at both object and kind levels, while the object reading tends to be more salient. Therefore, *uei ge kafei* can denote a coffee subkind as well as a cup of coffee at the object level.

(25) nge xihuan uei ge kafei.
I like that CL coffee
a. 'I like that kind of coffee.' *kind*
b. 'I like that cup of coffee.' *object*

A distinctive feature of Xi'anese demonstratives is that they can be preceded by numerals. Without numerals, *uei ge uan* 'that CL bowl' is ambiguous between a specific bowl object and a particular subkind of bowls, similar to *uei ge kafei* in (25). However, when preceded by a numeral, the object reading of *uei ge uan* becomes infelicitous. This is because the object reading would require a single object bowl to be atomized into three distinct bowl objects by the classifier, which is interpretatively problematic.

In contrast, the kind reading of *uei ge uan* resolves this issue by allowing access to its instantiations through type-shifting to a predicate. This enables further composition with the classifier and numeral, yielding a felicitous interpretation. This behavior demonstrates that *uei* can denote kinds, as only the kind reading is compatible in the NDP. Thus, the NDP with *uei* provides strong evidence that demonstratives can form kind expressions.

(26) nge iou san ge uei ge uan.
I have three CL that CL bowl
a. 'I have three bowls of that kind.' *kind*
b. #'I have three bowls of that bowl.' *object*

Unlike *uei*, *uo* doesn't require a classifier when combined with a noun, which broadens its range of possible readings. Without classifier, the entity denoted by *uo uan* doesn't need to be atomized. Since the nouns in Xi'anese are not number marked, *uo uan* can denote a plural entity at the object level. When it meets the cardinality of three, a definite reading arises. If a partitive operator applies before its combination with a numeral, a partitive reading emerges. Alternatively, when *uo uan* denotes an entity at the kind level, it gives rise to a kind interpretation. These interpretations and their derivation will be further discussed in the next section.

(27) nge iou san ge **uo** uan.
I have three $\text{CL}_{\text{individual}}$ that bowl
a. 'I have three bowls of that kind.' *kind*
b. 'I have those three bowls.' *definite*
c. 'I have three of those bowls.' *partitive*

3.3 The semantics of kind-denoting demonstratives

There are two primary approaches to derive the kind reading of demonstratives: the deferred/similarity approach and the kind-based approach.

Under the deferred reference approach, demonstratives consist of two main components that are related to the target of demonstration ('index') and the reference of demonstratives ('interpretation'), respectively. There is no explicit relation between them. The deferred reference can occur when there is sufficient background information that can establish the relation between the referent and pointed entity. This relation can distinguish the referent from what the speaker might have otherwise intended.

For example, the index and the interpretation can be related by a congruity relation established by contextual information rather than identity. Therefore, they can be different in (28). The index of *that* is the baseball player selected by pointing, while the interpretation of the demonstrative is the sport in which that player is involved.

(28) [speaker pointing to a baseball player:]
That's what we should play at recess. (Nunberg 1993; ex. 73)

While a demonstrative has been observed to have a deferred reference to kinds in (29), previous analyses only discuss pronominal demonstratives and don't explicitly explain

how the kind reading arises. For example, in (29), the kind reading of *that* is merely assumed without further explanation.

(29) That used to be made of metal. (Nunberg 1993; ex. 53)

The similarity approach argues that the target of pointing and the referent of a demonstrative phrase can be distinct and are connected by similarity (Umbach and Gust 2014). The German similarity demonstrative *so* is restricted to indefinites when used pre-nominally. The similarity encoded in *so* is a three-place relation. It includes the referent, the target of demonstration and the features of comparison F by which the similarity of the first two arguments are evaluated. For example, in (30), the target of demonstration is the car being pointed at, while the referent is a different car but similar to the one being pointed at.

(30) So ein Auto hat Anna (auch). [speaker pointing to a car on the street]
as a car have Anna too
'Anna has such a car/ a car like this, (too).'

The similarity demonstrative *so* can generate *ad-hoc* kinds (Umbach and Gust 2014). For instance, the cars denoted by *so ein Auto* in (30) are those similar to the car pointed to and are considered as an *ad-hoc* kind. *Ad-hoc* kinds differ from well-established kinds as they cannot appear with kind-denoting nominals such as *Art* 'kind'. The incompatibility with *Art* in (31b) suggests that *so ein auto* forms an *ad-hoc* kind not a well-established one.

(31) a. Dieses Auto ist eine besondere Art von Limousine.
b. ??So ein Auto ist eine besondere Art von Limousine.
'This car/ such a car is a special kind of limousine.'

In contrast, *uo* and *uei* can form well-established kinds, as evidenced by their compatibility with the kind-denoting nominal *zhong* 'kind', which is restricted to well-established kinds with the classifier *ge* interpreted at the kind level.

(32) uo che/ uei ge che si zhong xinxing di paoche.
that car/ that CL car is kind new DE sports car

Furthermore, *zhong* cannot appear with *ad-hoc* kinds, as shown below. *Dabei natie* 'the large latte' can't form a well-established kind so its co-occurrence with *zhong* is infelicitous as predicted.

(33) ??dabei natie si zhong tishen di yinliao.
large cup latte is kind refreshing DE drink

'The large latte is a kind of refreshing drink.'

Thus, the demonstratives in Xi'anese can form well-established kinds, which cannot be accounted for by the similarity approach.

Another problem with the similarity account is that it cannot explain certain kind-related behaviors of demonstrative expressions. Kind terms are generally restricted to a narrow scope in the indefinite context (Chierchia 1998, Dayal 2004, Jiang 2012). As shown in (34), *uo tuzi* exhibits the same restriction, allowing only a narrow scope.
[Mary is responsible for taking care of rabbits in a pet store. The speaker points to a single rabbit and says:]

(34) Mali fanfu-di wei uo tuzi.
Mary repeatedly feed that rabbit
'Mary repeatedly fed rabbits of that kind.'

The similarity approach predicts that *uo tuzi* denotes the class of individuals similar to the pointed rabbits regarding the aspects defined by F, much like *so ein Auto* in (35). Therefore, the generalized quantifier involved can take both a wide and narrow scope with respect to *repeatedly*. However, this is not the case since only a narrow scope is allowed in (34). This suggests that *uo* requires a different analysis, as the similarity account cannot adequately explain the scope restriction observed in the kind-denoting demonstrative.

(35) $[\![\text{so ein Auto hat Anna}]\!] = \exists x.\text{sim}(x, x_{\text{target}}, F) \,\&\, \text{car}(x) \,\&\, \text{own}(\text{anna}, x)$

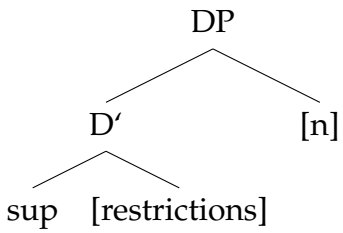
In contrast, the mere narrow scope of *uo tuzi* is expected under the kind-based account, with the application of *Derived Kind Predication* (DKP) (Chierchia 1998) defined below.

(36) a. *DKP*: If P applies to objects and k denotes a kind, then $P(k) = \exists x\, [^{\cup}k(x) \wedge P(x)]$
b. $^{\cup}$: $\lambda k_{<s,e>} \lambda x\, [x \leq k_s]$

DKP introduces an existential quantifier over the instantiations of a kind via the 'up'-operator $\cup$. The operator takes a kind and returns the instantiation set in a given context. *uo tuzi* is a kind term of type *e* and functions a direct argument of the predicate. As a result, the existential quantification introduced by DKP has to scope under the adverbial *repeatedly*.

Considering the limitations of the deferred/similarity analyses, I propose a kind-based approach to account for kind-denoting demonstratives. I adopt the basic structure of demonstratives in Ahn (2022) but come up with a new proposal for the additional argument represented as [n].

(37)



Before moving on, there is one clarification of the notion 'kind' in the current proposal. It is contrasted with 'object' rather than 'subkind', and the fine distinction between kinds and subkinds is not attempted here.

I take three main assumptions for the second argument of kind-referring demonstratives. First, it can be a domain restrictor, enabling access to subkind levels within the taxonomic hierarchy when a demonstrative combines with a taxonomic predicate. In (38), when the demonstrative composes with the taxonomic predicate LION, the pointing gesture specifies at the kind level as it does at the object level to allow the whole phrase to denote a particular lion subkind.

(38) [That LION]$_{\rightarrow a}$ is going to be extinct. [That LION]$_{\rightarrow b}$ is also going to be extinct. *kind*

Second, when the demonstrative combines with a property-denoting predicate, I incorporate the *realization relation* **R** (Krifka et al. 1995) to allow the demonstrative to denote a kind. The relation **R** (x, k) captures the relation between a kind and its instantiations, where an object individual x belongs to the kind k. For example, the common noun *dog* has two interpretations: when it refers to a kind, it is *Canis lupus*; when it denotes a set, it is λx[**R**(x, **Canis Iupus**)].

Since the relation between a kind and its members can be achieved in different ways cross-linguistically such as Turkish pseudo-incorporation (Sağ 2022) and Bangla classifier *ra* (Saha 2023), I propose that demonstratives can also establish this relation via **R** in some languages. In (39a), *those lions* connects the lion individuals in the context to a lion subkind. Similarly, in (39b), *uo kafei* 'that coffee' can denote a coffee subkind which the cups of coffee we identify in the real world belong to.

(39) a. Those lions are going to be extinct. (one subkind of lions)
b. nge xihuan uo kafei. (Xi'anese)
I like that coffee
'I like that kind of coffee.'

I propose that this kind-member relation results from a separation between the target of demonstration and the referent of the demonstrative phrase. One example is given by Krifka et al. (1995), where the singular pronominal *this* refers to the lion kind despite three

lions being pointed to. The demonstrative *this* connects the individual lions–its pointed target–to the kind reference of the phrase.

(40) [There are three lions in a cage in a zoo. A father points to them and says to his children:]
Look kids, this is the lion.

The kind-object separation is also observed in (Nunberg 1993). Consider a scenario where Phoebe gets a bigger and more expensive desk every time with promotion. The speaker points at her new desk and utters the following sentence. *That* in (41) doesn't refer to the desk being pointed at but the kind-level individual of which the pointed desk is the current instantiation.

(41) That used to be made of metal. (Nunberg 1993; ex. 53)

While demonstratives can link an object-level target of demonstration to a kind-level interpretation, they can also link a target and a referent both at the object level. In (42), *these* bridges the reference to the sample plates with the reference to those at the warehouse.

(42) [speaker pointing to sample plates:]
These are over at the warehouse. [adapted from Nunberg (1993; ex. 43)]

Additionally, this separation is found in the German similarity demonstrative *so* (Umbach and Gust 2014). In (43), the target of demonstration is the car being pointed at, while the referent of the DP is a different car owned by Anna, similar to the pointed car.

(43) So ein Auto hat Anna (auch). [speaker pointing to a car in the street]
as a car have Anna too
'Anna has such a car/ a car like this, (too).'

Last, I assume that demonstration (e.g., a pointing gesture) points to an individual and picks out some salient properties of it. A kind individual is formed through the *realization relation* **R** based on the object individuals that inherently have these salient properties and fit the description denoted by the noun.

Pointing functions in a way similar to Nunberg (1993)'s proposal that deixis can extract certain elements from the utterance context and use them as a pointer to interpret the demonstrative. For example, pointing at a baseball player can pick out the salient property of playing a specific sport, which serves as the pointer to the interpretation of *that* in (44).

(44) [speaker pointing to a baseball player:]

That's what we should play at recess. (Nunberg 1993; ex. 73)

However, Nunberg (1993) merely discusses pronominal demonstratives and doesn't offer an analysis of how salient properties contribute to the kind reading of all sorts of demonstratives.

Below I provide the denotation showing how demonstratives can form a kind reading.

(45) $[\![\text{that}_{\rightarrow}]\!] = \lambda P.\lambda G.\ \iota x_{\text{kind}}{:}\forall y[P(y) \wedge G(y) \leftrightarrow R(y, x_{\text{kind}})]$
That takes a property P and an additional restriction G contributed by pointing, where G represents the salient property of the pointed target. *That* returns the kind x such that for all y which is an instantiation of x, P(y) is true and G(y) is true.

For example, in (46a), the target of demonstration of *those lions* is the object lions pointed to in the context of utterance, while the denotation of it is a particular lion subkind, of which the lion objects picked out from the context are members. *l* following → in (46b) represents the lions pointed to at the object level. $\rightarrow_l$ refers to the salient property of the pointed lion individuals.

(46) a. [Those lions]$_{\rightarrow}$ are going to be extinct.
b. $[\![\text{those lions}_{\rightarrow}]\!] = \iota\text{LION}{:}\forall y[\text{lion}(y) \wedge \rightarrow_l(y) \leftrightarrow R(y, \text{LION})]$

As argued above, demonstratives can form kind expressions, supported by the evidence from English and Xi'anese. When composed with a taxonomic predicate, demonstratives impose restrictions on the domain of quantification and allow access to the subkind level in the taxonomic hierarchy. When combined with an individual predicate, they refer to the kind by establishing a relation between the kind and its instantiations.

In the next section, I analyze the numeral-demonstrative phrase (NDP) in Xi'anese, incorporating the proposed semantics of kind-denoting *uo*.

4 The semantics of the numeral-demonstrative phrase (NDP)

I first introduce the nominal structure in Xi'anese and then provide the analysis in detail.

4.1 The background on the nominal structure in Xi'anese

Xi'anese is a classifier language in that nouns require a classifier when combined with a numeral (Jiang 2012).

(47) san *(ge) tao
three $CL_{individual}$ peach
'three peaches'

Following previous literature, I assume that nouns in Xi'anese are cumulative predicates containing a set of atomic and sum individuals. Classifiers turn cumulative predicates to atomic predicates (Chierchia 1998), and restrict the predicate to either the kind or object domain (Jenks 2018).

There is a wide array of classifiers in the language. For example, individual classifiers or count classifiers as in (48a), encode the inherent partitioning unit of a noun while mass classifiers in (48b) can create a unit of measurement (Cheng and Sybesma 1999). Kind classifiers such as *zhong* in (48c) indicate a subkind relation to the noun's denoted kind (Liao and Wang 2011, Jiang 2012).

(48) a. san tiao iu
three $CL_{individual}$ fish
'three fish' *the individual classifier*

b. san xiang iu
three CL_{mass}(box) fish
'three boxes of fish' *the mass classifier*

c. san zhong iu
three CL_{kind} fish
'three kinds of fish' *the kind classifier*

It is worth noting that the classifier *ge* in Xi'anese has bleached content and can be used as both an individual and a kind classifier. This allows *uei ge N* to denote a particular object as well as a subkind.

(49) uei ge iu
that CL fish
a. 'that fish'
b. 'that kind of fish'

4.1.1 Bare nouns

Xi'anese lacks definite determiners and allows arguments to be bare. The bare noun *iu* 'fish' can occur in the subject position in (50a) and the object position in (50b).

(50) a. iu haochi.
fish delicious
'Fish are delicious.'

b. nge xihuan chi iu.
I like eat fish
'I like eating fish.'

They are compatible with kind-level as well as individual-level predicates. When used at the object level, they can yield either a definite or a narrow scope reading.

(51) gou zai uar jiao ni.
dog PROG there bark SFP
a. 'The dog(s) are barking.' *definite*
b. 'Dogs are barking.' *existential*

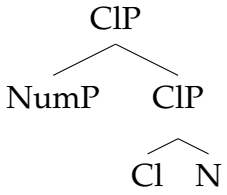
Due to a lack of number morphology, bare nouns are number neutral in Xi'anese. The bare noun *gou* refers to a singular entity in (52a) while *iu* refers to multiple fish in (52b).

(52) a. gou pao lie.
dog run SFP
'The dog ran away.'
b. iu dao-chu dou si.
fish everywhere DOU be
'Fish (different ones) are everywhere.'

4.1.2 Numeral constructions

The numeral construction (NC) in Xi'anese typically consists of three components in the sequence numeral-classfier-noun. The syntax of NCs is given below.

(53)



NCs can be predicative and argumental. The dual properties of NCs can be accounted for by the lexical ambiguity of numerals, since they can be either a predicate modifier or a generalized quantifier (Dayal 2012, Jiang 2012). A numeral modifier gives a predicative NC whereas a numeral quantifier returns an argumental NC.

4.2 The numeral-demonstrative phrase

While there are 14 attested word orders of pre-nominal modifiers (Cinque 2005), none of them allows numerals before demonstratives. However, a numeral can precede or follow

a demonstrative in Xi'anese. When the numeral appears after the demonstrative, the structure yields a typical definite reading in (54a). When it occurs before a demonstrative, the NDP is formed and can have three distinct interpretations in (54b).

(54) a. uo san tiao iu
that three $CL_{individual}$ fish
'those three fish' *definite*

b. san tiao uo iu
three $CL_{individual}$ that fish
a. 'three bowls of that kind.' *kind*
b. 'those three bowls.' *definite*
c. 'three of those bowls.' *partitive*

However, certain restrictions apply to the NDP. First, nouns such as *ren* 'person/ people' are not felicitous in this structure.

(55) # nge jiao-lie san ge uo ren.
I inivite-ASP three $CL_{individual}$ that person
'I invited three of that person.'

While the demonstrative phrase in NDP can denote at the kind level, the infelicity of (55) may be due to that common nouns such as being/person don't have an entity with which they could contrast. Therefore, *uo ren* 'that person' cannot qualify as a genuine kind term (Kay 1971).

Second, there is a restriction on the classifier: the classifier following the numeral must be selected by the noun. The individual classifier *tiao* can only co-occur with the noun *iu* 'fish', while *gen* is restricted to *bi* 'pen'. This restriction holds in both NCs and NDPs, as illustrated below. *iu* 'fish' in the NDP as in a normal NC.

(56) a. san tiao/#gen iu
three $CL_{individual}$ fish
'three fish'

b. san #tiao/gen bi
three $CL_{individual}$ pen
'three pens'

When the selecting noun *iu* appears, only the corresponding classifier *tiao* is felicitous.

(57) san tiao/#gen uo iu
three $CL_{individual}$ that fish

When a classifier is added between the demonstrative and the noun, it can only be a kind

classifier. As shown below, the individual-denoting classifier *tiao* and the mass classifier *xiang* 'box' are prohibited after the demonstrative in the structure.

(58) nge iao san tiao uei #tiao/ #xiang/ zhong/ge yu.
I want three CL that $CL_{individual}$/ CL_{mass}/ CL_{kind} fish
'I want three fish of that kind.'

Third, a pronominal demonstrative can replace the demonstrative phrase in the NDP, but a pronoun cannot. (60a) means Ming wants two of the particular dog Ling owns but Ming may want two dogs which are from the same breed as Ling's dog in (60b). The comparison provides another evidence to the kind-denoting use of demonstratives.

[context: Ling and Ming are talking about Ling's dog.]

(59) nge xiang iang liang tiao uo gou.
I want raise two $CL_{individual}$ that dog
'I want to raise two dogs of that kind.'

(60) a. Ming: #ngeng xiang iang liang tiao ta.
I want raise two $CL_{individual}$ it

b. Ming: ngeng xiang iang liang tiao uo.
I want raise two $CL_{individual}$ that

Last, the NDP cannot appear in the subject position. The ungrammaticality of (61) may be due to that numeral phrases are universally indefinites (Jiang 2012) and are not allowed in the subject position which prefers definites. While the NDP can have a definite interpretation, it is more semantically complex with multiple meanings. Therefore, the definite structure with a single definite meaning is preferred in the subject position.

(61) *san ge $uo_{\rightarrow}$ uan diao lie.
three $CL_{individual}$ that bowl fall SFP

The exception is when the numeral phrase denotes a general property/quantity of the noun in (62). The same is applied to a pronominal demonstrative. With pointing, the pronominal *uo* can refer to a specific bowl. *san ge uo* 'three CL that' is semantically equivalent to *san ge uo uan* 'three CL that bowl'.

(62) san ge $uo_{\rightarrow}$ (uan) zou gou lie.
three $CL_{individual}$ that bowl already enough SFP
'Three bowls like that are enough.'

4.3 The analysis

Syntactically, the NDP forms a constituent as it passes the constituency tests demonstrated below.

(63) a. ni xiang iao sa? (Fragment test)
you want ask what
'What do you want?'

b. san ge uo lan uan.
three $CL_{individual}$ that blue bowl

(64) san ge uo lan uan, ngeng xiang iao. (Topicalization)
three $CL_{individual}$ that blue bowl, I want ask

4.3.1 The kind reading

As a classifier language, Xi'anese doesn't overtly mark nouns for countability; instead, classifiers are used for counting. When numerals, quantifiers and demonstratives combine a noun, a classifier is always required. Interestingly, *uo* can directly combine with a noun. I assume that it can access individuals at different levels denoted by the noun, and select the maximal individual at the relevant level without a classifier.

As previously argued, demonstratives can form kind expressions. The denotation of *uo* is given below.

(65) $[\![uo_{\rightarrow}]\!] = \lambda P.\lambda G.\ \iota x_{kind}{:}\forall y[P(y) \wedge G(y) \leftrightarrow R(y, x_{kind})]$
uo takes a property P and an additional restriction G imposed by pointing, where G represents the salient property of the pointed individual. It returns the kind x such that for all y which is an instantiation of x, P(y) is true and G(y) is true.

To derive the kind reading of the NDP, I adopt the semantics of quantifier-like numerals from Dayal (2012) and individual classifiers from Jenks (2018). An individual classifier turns a cumulative predicate to an atomic one. *AT* is a predicate that returns the set of individuals which don't have proper parts (Dayal 2012).

(66) a. $[\![numeral]\!] = \lambda P.\lambda Q.\ \exists x\ [P(x) \wedge numeral(x) \wedge Q(x)]$ (Dayal 2012)
The numeral means there exists some x such that P(x) = 1, Q(x) = 1 and the cardinality of x is required by the numeral.

b. $[\![CL_{individual}]\!] = \lambda P.\lambda x.\lambda s\ [P(x)(s) \wedge AT_{obj}(x)]$ (Jenks 2018)
λx_e. x is an atomic object and has the property P in *s*.
An individual classifier takes a set of atomic and non-atomic individuals and returns a set of atomic object individuals in a given situation.

The derivation of the kind-based reading is provided below. First, *uo* combines with the property-denoting nominal predicate 'bowl' to form a subkind which the pointed bowls are instantiations of. $\rightarrow_b$ refers to the salient properties of the pointed bowls.

(67) $[\![\text{uo bowl}]\!] = \iota\text{BOWL}:\forall y[\text{bowl}(y) \wedge \rightarrow_b(y) \leftrightarrow R(y, \text{BOWL})]$

Then, the result phrase is type-shifted by the up-operator $\cup$ to resolve the type-mismatch between the kind and the classifier, yielding a cumulative predicate. BOWL' denotes the newly formed subkind and bowl' is the set of bowls of that kind.

(68) $[\![^{\cup}[\text{uo bowl}]]\!] = \lambda x\ [x \leq \text{BOWL}'] = \lambda x.\text{bowl}'(x)$

The predicate bowl' further combines with a classifier and a numeral. The individual classifier *ge* gives a set of atomic book objects of the kind specified by pointing. The numeral restricts the cardinality of x to be three. The NDP denotes the set of properties of some set of three books of a particular kind.

(69) $[\![\text{three CL uo bowl}]\!] = \lambda Q.\ \exists x[\text{bowl}'(x) \wedge 3\ (x) \wedge Q\ (x)]$

4.3.2 The definite reading

According to Gutzmann and McCready (2014), referential descriptions are use-conditional like appositives. They are additional predication on the referent and can be stacked. Similarly, the pre-demonstrative modifiers in the NDP can also be stacked. For example, the numeral and the relative clause are stacked before a demonstrative phrase, as shown below.

(70) [[$_{\text{NumP}}$ san dai] [$_{\text{CP}}$ ni ie-ge mai di] [uo nai]]
three $\text{CL}_{\text{individual}}$ you yesterday buy DE that milk
'three bags of milk that you bought yesterday'

There is only one *R* property represented by [n] in the structure of demonstratives (Ahn 2022) and it is already occupied by the pointing gesture in the definite NDP. Following Ebert et al. (2020), I suggest pre-demonstrative numerals contribute to non-at-issue meanings as secondary information. They can function as predicates on the noun when combined with measurement phrases such as *sui* or classifiers. In the following examples, the numerals *jiushi* '90' and *wu* 'five' function as predicates applied to the subject.

(71) a. yeye jiushi (sui) le.
grandfather ninety (old) SFP
'Grandfather is 90 years old.'

b. ma (you) wu pi.
horse have/exist five $CL_{individual}$

By extending Ebert et al. (2020)'s analysis, the denotation of the definite NDP is given below. $_{p^*}$ indicates the non-at-issue meanings while $_p$ marks the at-issue content. z is the gesture referent and x stands for the discourse referent. $\mathbf{I_5}$ is the rigid designator which refers to the five bags of milk pointed to. The meaning of the sentence is only determined by the at-issue content.

(72) a. nge iao ba [san bao uo nai] he lie. [pointing to a pack of five]
I want BA three $CL_{individual}$ that milk drink SFP
'I will drink those three bags of milk.'

b. $[x] \wedge \text{milk}_p(x) \wedge [z] \wedge z = \mathbf{I_5} \wedge x =_{p^*} z \wedge \text{milk}_{p^*}(z) \wedge \text{three}_{p^*}(z) \wedge \text{drink}_p(I, x)$

- presupposition: there is a unique (set of) bag(s) of milk which is/are identical to the gesture referent
- at-issue: I am going to drink that bag/those bags of milk
- non-at-issue: there are three bags of milk, the gesture referent is the milk

Since the numeral projects at the non-at-issue level, (72a) is not truth-conditionally false. The mismatch between the at-issue and non-at-issue meanings simply gives rise to the oddness of the sentence. For instance, the hearer knows that the speaker will drink those bags of milk being pointed to while she may feel confused by the quantity mismatch. The sentence can be improved by a following explanation such as 'Sorry, I got the number wrong. It should be five.'

However, the sentence is false when the post-demonstrative numeral is part of the nominal restriction on the demonstrative.

(73) nge iao ba [uo san bao nai] he lie. [pointing to a pack of five]
I want BA that three $CL_{individual}$ milk drink SFP

- presupposition: there is a unique (set of) bag(s) of milk which is/are identical to the gesture referent
- at-issue: I am going to drink those three bags of milk
- non-at-issue: the gesture referent is the milk

Therefore, the definite NDP is a normal definite description with secondary information at the non-at-issue level contributed by the pre-demonstrative numeral.

4.4 The partitive reading

A similar construction to the partitive NDP is the multiple classifier construction (MCC) in Liao and Wang (2011), as shown in (74). In both structures, the lower nominal phrase is definite and refers to a plural entity but the NDP has only one classifier.

(74) san tiao zhe zhong yu
three $CL_{individual}$ this CL_{kind} fish

When a non-kind classifier is added after the demonstrative in the NDP, the resulting phrase is infelicitous because it refers to an atomic individual that cannot be further partitioned.

For example, without classifiers, *zhe tang* is ambiguous between 'that candy' and 'those candies' since nouns in Xi'anese lacks overt number marking and are number neutral. When the lower phrase is interpreted as 'those candies', the NDP is felicitous with a partitive reading. However, when a mass classifier is added between the demonstrative and the noun, the phrase becomes unacceptable. This is because an atomic individual –'this jar that contains candies'–cannot be further divided into three distinct individuals.

(75) san ping zhe (*tong) tang (Xi'anese)
san $CL_{individual}$(bottle) this CL_{mass}(jar) candy

Liao and Wang (2011) propose a covert partitive projection in the MCC, equivalent to the English partitive *of* which 'unpacks' an entity into a set of individuals.

(76) $[\![of_{part}]\!]_{\epsilon\ D<e,<e,t>>} = \lambda x_{\epsilon De}.\lambda y_{\epsilon De}.y < x$ (Barker 1998)

While Liao and Wang (2011) argue that the lower DP in the MCC denotes a plural entity, I propose that it is a kind-level individual due to the presence of a kind classifier. Whether a kind individual is inherently plural is beyond the scope of this paper. However, the partitive nature of MCC corresponds more to the kind-referring feature of NDPs in which the role of *of* may be accessing the instantiations of a kind rather than 'unpacking a single entity'.

Similar to a partitive construction, the partitive NDP exhibits a part-whole relation between the measure phrase (i.e., the numeral) and the measured phrase (i.e., the lower DP). One way to distinguish a partitive measure phrase and an attributive modifier is through the obligatory *de* since it is required by a syntactic modifier. The numeral in (77a) is a modifier with a mandatory *de* while the one in (77b) can be a measure phrase with an optional *de*.

(77) a. san bang *(de) zhe bao tangguo (Mandarin)
three pound DE this pack candy
'this three-pound pack of candy'

b. san bang (di) zhe iu (Xi'anese)
three pound DE this fish
'three pounds of this fish'

MCCs might not be a true partitive construction but I adopt the view that an equivalent to the English partitive *of* exists in Xi'anese. Following Ionin and Matushansky (2006), I assume that it takes a non-atom-denoting entity but differs in that it returns a proper part of this entity, as illustrated in the example below. If the entire entity were to be extracted, a different structure would be required.

(78) ??suoyou di uo qian
all DE that money
'all of the money'

I assume there is a covert mechanism, either a syntactic projection or type-shifting operation which encodes the part-whole relation and makes the members denoted by the noun accessible for the numeral to quantify over.

By incorporating the quantifier numeral and the partitive operation, the denotation of the partitive NDP is derived as follows. *op* represents the covert partitive mechanism.

(79) a. $[\![\text{uo bowl}]\!] = \iota x\colon \forall y\ [\text{bowl}(y) \leftrightarrow y \sqsubseteq x]$

b. $[\![op\ \text{uo bowl}]\!] = \lambda y_{\epsilon De}.y < b$

c. $[\![\text{three CL } op\ \text{uo bowl}]\!] = \lambda Q.\ \exists x\ [x<b \wedge 3(x) \wedge Q(x)]$

5 Conclusion

In this paper, I have introduced a new perspective on the use of demonstratives, arguing that they can form kind expressions and supporting this claim with novel evidence from Xi'anese and English. I also provide a formal analysis of how this kind-based reading is derived. By examining the semantics of a non-canonical structure in Xi'anese, I have shown that it differs from a standard definite description. Although its surface word order appears unattested, I propose that it can emerge from distinct underlying constructions or semantics, such as a partitive structure or a kind-denoting expression.

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