

PSEUDO NOUN INCORPORATION IN DISCOURSE¹

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This paper argues that Samoan has three kinds of indefinites: wide scope indefinites signalled by the determiner *le*, which escape any embedding under a sentential operator (such as negation, conditionals, etc.), narrow scope indefinites signalled by the determiner *se*, which scope underneath sentential operators if any are present, and bare NPs. Bare NPs behave as if they are always embedded underneath a sentential operator. I argue for this analysis based on their inability to license cross-sentential anaphora. I analyse the lexical semantics of Samoan bare NP indefinites as introducing existential quantification scoping under a *closure* operator which has no truth-conditional effect of its own but serves to destroy the potential of the existential quantifier scoping underneath it to bind cross-sentential anaphors.

1. Introduction

This paper details the semantic properties of a particular breed of indefinites in the Polynesian language Samoan which have been frequently termed “incorporated objects” in the descriptive literature on the language (e.g. Mosel and Hovdhaugen 1992: 738). These indefinites do not take any determiner (being realised as bare noun phrases), and appear adjacent to the main predicate. Compare (1a) and (1b), which contain indefinite arguments marked by the determiners *se* and *le* respectively, with (1c), which contains the putative incorporation construction.²

- (1) a. *Sā tusi e Susana se pese.*
PAST write ERG Susana NONSPEC song
‘Susana was writing a song.’
- b. *Sā tusi e Susana le pese.*
PAST write ERG Susana SPEC song
‘Susana was writing a (certain) song.’
- c. *Sā tusi pese Susana.*
PAST write song Susana
‘Susana was song-writing/writing a song/writing songs.’

The sentences in (1) signal existential quantification. The sentences are true only if the set of songs has a non-empty intersection with the set of things which Susana wrote. The

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²Abbreviations used throughout: ABS absolutive, ACC accusative, AV actor-voice, CL clitic, COMP completiser, CONN connective particle, DAT dative, DAT.CL dative clitic, EMPH emphatic particle, ERG ergative, FUT future tense, GEN genitive, HON honorific, LOC.CL locative clitic, NEG negation, NOMLZ nominalised verb, NONSPEC non-specific determiner, Q question particle, PAST past tense, PERF perfect aspect, PL plural, PRES present tense, PROG progressive aspect, SG singular, SPEC specific determiner, SUBJUNCT subjunctive, TOP topic marker

interpretative differences between the three kinds of indefinites are revealed in more complex constructions. In the presence of scope-taking sentential operators (such as negation, modals, conditional clauses etc.), existential quantification introduced by *le* DPs is uniformly wide-scoping, while existential quantification introduced by *se* DPs or bare NP objects is uniformly narrow-scoping. In multi-sentence texts, I show that both *se* DPs and *le* DPs are able to antecede pronominal anaphora across sentence boundaries, while bare NPs are not.

2. The Syntax of Samoan Bare NP Objects

Samoan bare NP objects share several morphosyntactic properties with incorporated nominals cross-linguistically, e.g., the Inuit example (2) from Van Geenhoven (1998).

- (2) *Arnajaraq eqlut-tur-p-u-q.*
 Arnajaraq.ABS salmon-eat-IND-INTR-3SG
 ‘Arnajaraq ate salmon.’

Bare NPs are strictly adjacent to the verb. For example, the dative clitic *i ai* and the locative clitic *ai* attach to the right of the Samoan verbal complex. Mithun (1984) shows that semantically non-specific, morphosyntactically bare NP objects uniformly appear within the verbal complex to the left of dative/locative clitic (3a). It appears without case marking, determiners or pre-nominal modifiers. Contrast this with NPs receiving a plural, specific interpretation, which appear to the right of the dative/locative clitic (3b).

- (3) a. *Po ‘o āfea e tausi (*se/ni) tama ai ia?*
 Q TOP when PRES care NONSPEC.SG/PL child LOC.CL he
 ‘When does he baby-sit?’ (Chung 1978: 184)
- b. *Po ‘o āfea e tausi ai e ia tama?*
 Q TOP when PRES care LOC.CL ERG he child
 ‘When does he care for the children?’ (Chung 1978: 184)

Only the less agentive argument of transitive verbs may be expressed as a verb-adjacent bare NP. For example, intransitive subjects are unable to appear in the pre-clitic position.

- (4) **sā liusuāvai ‘aisa ai.*
 PAST melt ice DAT.CL
 ‘Some ice melted.’/‘Ice-melting happened.’

Expressing an object as a bare NP detransitivises the predicate. Samoan is also traditionally thought of as an ergative-absolutive aligned language in its morphological case system. In transitive clauses, the subject takes the ergative case marker *e* (5a). Where the object is expressed as a bare indefinite, the subject does not take the ergative case marker (5b).

- (5) a. *Sā inu le ‘ava e Ioane.*
 PAST drink SPEC kava ERG John
 ‘John drank the kava.’

- b. *Sā inu ava *(e) Ioane.*
 PAST drink kava ERG John
 ‘John kava-drank.’

Unlike the Inuit example in (2), Samoan bare objects do not appear to involve the morphological incorporation of a nominal head into the verb. Samoan bare objects are able to take (post-nominal) modifiers.

- (6) a. *E tatau fo‘i ‘ona ‘āmata su‘e mea e fai ai*
 PRES must again COMP begin search thing COMP do there
saoga.
 righteous.PL
 ‘The righteous must again start to search for things to do there.’
 (So‘ogafai, *Fa‘aipoipoiga le taunu‘u* (poem), 2013)
- b. ...*‘ona ‘o le fai mea piopio o faifeau*
 because TOP SPEC do thing wicked of pastor.PL
 ‘Because the pastors do crooked things.’ (Mosel and Hovdhaugen 1992: 548)

These data suggest Samoan bare objects should be classified as pseudo incorporated NPs, much like a similar variety of indefinites observed by Massam (2001) in the closely related language Niuean. According to Massam, the syntactic distribution of pseudo-incorporated NPs in Niuean may be explained by positing that the VP, with a structure [_{VP} V NP] containing the verb and a bare NP internal argument, fronts to a clause-initial position.

3. Indefinite Characteristics

In this section I argue that the three types of Samoan nominal expressions exemplified in (1) show definitional characteristics of indefinites: they do not entail the discourse-familiarity of their witness and can be used to introduce novel discourse referents. The use of a *se* DP, *le* DP or bare NP does not signal any kind of discourse familiarity. Any of the three may be employed to refer to an individual without previous mention in the discourse (7).

- (7) a. *Sā iai le ulugali‘i ‘o Papa le tane ‘a ‘o Eleele*
 PAST exist the couple TOP Papa SPEC husband but TOP Eleele
le fafine i Manua.
 SPEC woman LOC Manua
 ‘There was a couple, Papa the husband and Eleele the wife, in Manua.’
 (Mosel and Hovdhaugen 1992: 262)
- b. *Sā iai se ali‘i malosi ma se tamaitai aulelei.*
 PAST exist NONSPEC chief strong and NONSPEC lady beautiful
 ‘There was a strong chief and a beautiful lady.’
 (Gagana Sāmoa—NZ Curriculum Online,
nzcurriculum.tki.org.nz/content/download/464/3653/file/gagana.pdf)
- c. *Sā fa‘atau lole ‘i ai lona tamā.*
 PAST buy lolly for.her her father
 ‘Her father bought lollies for her.’
 (Mosel and Hovdhaugen 1992: 696)

Beyond demonstrating that all three kinds of expressions can be used to refer to novel discourse referents, (7a) and (7b) also illustrate that both *le* DPs and *se* DPs may serve as the pivot of an existential sentence. As in English, this morphosyntactic environment distinguishes strong and weak quantifiers (though see Ward and Birner 1995, McNally 1998 for arguments against this view). The addition of the universally quantifying particle *ta'itāsi* results in infelicity (8). This paradigm provides evidence that both *se* and *le* DPs are weak quantifiers. Note that bare NPs may not serve as an existential-pivot as they are only licensed in the object position of a transitive verb.

- (8) #*Sā iai le tagata ta'itāsi i le fale.*
 PAST exist SPEC person all at SPEC house
 'There were all the people at the house.'

Sluicing is another test for indefiniteness: the inner antecedent (or correlate) for the *wh*-remnant stranded by sluicing ellipsis may only be existential (Chung et al 1994, Matthewson 1998).

- (9) A man/some man/*the man/*this man/*every man left, but I don't know which man.

In (10), we see that both *se* DPs and *le* DPs are able to serve as the inner antecedent for a sluice, further evidencing their status as indefinite.

- (10) a. *sā sasa se maile e le tamaloa 'ae 'ou te lē*
 PAST beat NONSPEC dog ERG SPEC old.man but I PRES not
iloa pe 'o lēfea maile
 know Q which dog
 'The old man beat a dog but I don't know which dog.'
- b. *sā sasa le maile e le tamaloa 'ae 'ou te lē iloa*
 PAST beat SPEC dog ERG SPEC old.man but I PRES not know
pe 'o lēfea maile
 Q which dog
 'The old man beat a particular dog but I don't know which dog.'

Bare NPs are uniformly unable to serve as the inner antecedent for a sluice. I take this to be a result of factors external to their status as indefinite: one possibility is that the intransitive structure of the antecedent clause does not match the transitive structure of the interrogative clause, blocking its ellipsis via syntactic mismatch. Alternatively the inability of bare NPs to license discourse anaphora could carry over to limit their ability to antecede the *wh*-remnant of a sluice. Collins (2013) pursues the latter hypothesis.

4. Scopal Characteristics

Treating *se* DPs and bare NPs as indefinite correctly predicts their ability to take narrow scope with respect to logical operators such as negation and conditionals. In fact, in this section I show that both *se* DPs and bare NPs obligatorily take narrow scope in such contexts, and do

not allow wide scope readings. I also demonstrate that *le* DPs appear to obligatorily take wide scope with respect to logical operators, warranting their classification as specific indefinites.³

Sentential negation in Samoan is expressed with pre-verbal particles, most commonly *lē* or *le'i*. The following examples demonstrate that *se* indefinites obligatorily scope below negation, regardless of whether the *se* indefinite is in subject, object or an oblique position. Samoan lacks a determiner analogous to English 'no'. Negated existential quantification is expressed by the combination of sentential negation and the *se* indefinite.

- (11) a. *E le'i iloa ā e se isi lenā mea.*
 PRES not.yet know EMPH ERG NONSPEC one that thing
 'No one yet knows that thing.'
not 'There is someone who doesn't yet know that thing.'
 (Mosel and Hovdhaugen 1992: 765)
- b. *...e lē fia talanoa mai 'iate 'oe po'o se isi lava tagata o lou aiga.*
 PRES not want chat DIR to you or NONSPEC other EMPH
 person of your family.
 '[He] does not want to chat to you or any one else in your family.'
not 'He does not want to chat to you or a particular person in your family.'
 (Samoan Parenting Guide, Spectrum Migrant Resource Centre, 2008)
- c. *'Aua ne'i faia se tali.*
 Don't say NONSPEC word.
 'Don't reply (say any word).'
not 'Don't say a particular word.'
 (Milner 1976: 33)

Bare NP indefinites also scope below negation.

- (12) a. *Na taliaina e au uo faigaluega lo'u tulaga ou te le inu pia.*
 PAST accept ERG my.PL friend work my position I PRES not
 drink beer
 'My work colleagues accepted my position of not drinking beer.'
not 'My work colleagues accepted that there is a beer that I don't drink.'
 (Hazel Marie Tibule, Na o Le Ataata Lava ma Fai Atu Leai
<http://www.lds.org/liahona/2013/10/youth/just-smile-and-say-no>)
- b. *Sā 'ou lē fa'atau api ai.*
 PAST I not buy notebook there
 'I didn't notebook-buy there.'
not 'There is a notebook that I didn't buy there.'

The existence implication introduced by *le* DPs escapes negation.

³I leave open the question of how intermediate scope readings of indefinites are formed, if they are allowed at all. For example, can any of the three types of indefinites scope between two distinct sentential operators, such as a modal and negation?

- (13) a. *E lē 'o nofoia le fale lenā.*
 PRES not LK occupied SPEC house that
 'That house is not occupied.'
not 'No house is occupied.' (Milner 1976: 104)
- b. *E le'i fia fa'alogo mai 'iai le tagata ao aitalafu.*
 PRES not want listen DIR to.it SPEC debt collector
 'The debt collector does not want to listen to it.'
not 'No debt collector wants to listen to it.' (Consumer Credit Legal Centre NSW,
 cclcnsw.org.au/wp-content/uploads/PDF/samoan_fs5.pdf)

Conditional clauses reveal a similar pattern: *se* indefinites and bare NP indefinites uniformly scope within the conditional antecedent clause, while *le* indefinites uniformly scope out of the conditional.

- (14) a. *'Āfai na fasiotia se tasi o lou aiga, e tāua*
 if PAST killed NONSPEC one of your family, PRES important
tele la le mauaina e oe ma lou aiga o se
 very SPEC get.NOMLZ ERG you and your family of NONSPEC
fesoasoani
 help
 'If any of your family is killed, you and your family getting help is very important.'
not 'If a particular member of your family is killed...'
 (Mo tagata ua aafia ona o se tasi ua fasiotia, Victims Information
 victimsinfo.govt.nz/assets/pamphlets/For-people-affected-by-homicide-pdfs)
- b. *ae 'āfai e te lē iloa sui ofu, 'o lea lē fiafia fo'i*
 but if you PRES not know sew dress, will not like also
ni a'u uo 'iate 'oe
 NONSPEC=1PL friend DAT you
 'But if you don't know how to sew dresses, your friends will not like you.'
not 'there is a dress such that if you don't know how to sew it...'
 (Mosel and Hovdhaugen 1992: 603)
- c. *'Āfai 'olea tapē e lo'u uso le pua'a, 'olea mafai 'ona*
 if FUT kill ERG my brother SPEC pig, FUT can COMP
mātou 'ai se 'aiga tele.
 we eat NONSPEC meal big
 'If my brother kills a (particular) pig, we can eat a big meal.'
not 'If my brother kills any old pig, we can eat a big meal.'

We find similar scopal patterns for other kinds of sentential operators, for example modals, imperatives, and interrogatives. Both *se* DPs and bare NPs appear to behave as obligatorily narrow scope indefinites, introducing existential quantification scoping under any other logical operator. A question arises as to whether either kind of indefinite is licensed only within the scope of a higher operator which would make them 'dependent indefinites' (Farkas 1997). Preliminary evidence points to both kinds of indefinites being independent. Both appear to be able to occur unembedded in episodic contexts, without any higher scoping operators.

- (15) a. *Sā fesili mai se tamaitai po'o ai lo ma tamā.*
 PAST ask DIR NONSPEC woman Q who our father
 'A woman asked who our father is.' (Mosel and Hovdhaugen 1992: 261)
- b. *Sā fa'atau lole 'i ai lona tamā.*
 PAST buy lolly for.her her father
 'Her father bought lollies for her.'
 (Mosel and Hovdhaugen 1992: 696)

Previous analyses of narrow scope indefinites (Van Geenhoven 1998, Chung and Ladusaw 2004) give a uniform treatment for indefinites with various morphosyntactic properties. Van Geenhoven shows that incorporated objects in West Greenlandic are narrowest scope indefinites and proposes that they denote properties (1-place predicates). Their selecting verb type-shifts in order to compose with a property-type argument. Existential quantification is introduced within the lexical semantics of the verb, ensuring its scoping below any operators elsewhere in the sentence.

- (16) Van Geenhoven's type-shifter on transitive verbs:
 $\lambda x \lambda y. \llbracket \mathbf{V} \rrbracket (y, x) \Rightarrow \lambda P \lambda y. \exists x [\llbracket \mathbf{V} \rrbracket (y, x) \wedge P(x)]$

Chung and Ladusaw (2004) propose (for Māori indefinites headed by the determiner *he* and Chamorro incorporated NPs) that the property denoted by the descriptive content of the indefinite is conjoined with the predicate via a semantic operation Restrict. The open variable is then existentially closed at some point in the derivation below higher scoping operators.

- (17) Chung and Ladusaw's Restrict:
 $\text{Restrict}(\lambda x \lambda y. \llbracket \mathbf{V} \rrbracket (y, x), \lambda z. \llbracket \mathbf{NP} \rrbracket (z)) = \lambda x \lambda y. \llbracket \mathbf{V} \rrbracket (y, x) \wedge \llbracket \mathbf{NP} \rrbracket (x),$

Should Samoan *se* DPs and bare NPs receive a uniform semantic treatment as obligatorily narrowest scope existential quantification? If so, why does Samoan support two semantically equivalent kinds of indefinite expressions not in complementary distribution? In the following section. I argue that the two kinds of indefinites differ in their ability to license inter-sentential anaphora and that their lexical semantics should reflect this difference.

5. Wide Scope, Narrow Scope and Stubborn Narrow Scope

I argue that each type of Samoan indefinite demonstrates a different way of taking scope. As evidenced by the data in the previous section, *le* DPs obligatorily scope wide, while *se* DPs and bare NPs necessarily scope narrow. When embedded under the scope of a higher operator, the *se* DP is unable to antecede cross-sentential pronominal anaphora (18a). Unembedded, the *se* DP does license anaphora, thus behaving like an ordinary wide scoping indefinite (18b).

- (18) a. *sā lē fa'apāgotā se_i foamea e Ioane. #'Ua ia_i ita.*
 PAST not arrest NONSPEC thief ERG John. PERF he angry
 'John didn't arrest any thief. He became angry.'
- b. *sā fa'apāgotā se_i foamea e Ioane. 'Ua ia_i ita.*
 PAST arrest NONSPEC thief ERG John. PERF he angry
 'John arrested a thief. He became angry.'

The bare NPs, on the other hand, do not license pronominal anaphora cross-sententially, regardless of whether there is a higher scoping operator.

- (19) a. *sā lē fa'apāgotā foamea_i Ioane. #'Ua ia_i ita.*
 PAST not arrest thief John. PERF he angry
 'John didn't thief-arrest. He became angry.'
- b. *sā fa'apāgotā foamea_i Ioane. #'Ua ia_i ita.*
 PAST arrest thief John. PERF he angry
 'John thief-arrested. He became angry.'

The two kinds of Samoan narrow scope indefinites represent two ways of taking narrow scope: *se* indefinites will take wide scope so long as there is no other operator, while bare indefinites behave as if they were stubbornly trapped in narrow scope even in the absence of other kinds of scope-taking operators.

I argue that the anaphoric contrast between the two narrow scope indefinites can be represented in their lexical semantics. The formal system I appeal to is Dynamic Predicate Logic (DPL) (Groenendijk and Stokhof 1991). DPL is a dynamic system designed to deal with the ability of various sentence types to antecede cross-sentential anaphora depending on the hierarchical composition of logical operators within the sentence's logical form and their relative scope. Sentences may be classified as *externally dynamic* (able to antecede anaphora in subsequent sentences) or *externally static* (not able to antecede cross-sentential anaphora). The system also provides a *closure* operator (which I notate as !), which shifts externally dynamic sentences into externally static ones, blocking their potential for binding cross-sentential anaphora.

The meaning of a sentence in DPL is the way that it updates the information state of its interpreter. In particular, the interpreter narrows the range of possible ways that free variables encountered in interpreting anaphoric expressions can be paired with individuals in the world. A possible mapping of variables to individuals is an assignment function. A sentence *S* in DPL denotes the set of all possible input-output pairs of assignments $\langle g, h \rangle$, where *g* is a possible way the interpreter assigned variables to individuals before interpreting *S*, and *h* is a possible way of assigning variables to individuals after interpreting *S*. The full system is laid out in Appendix A.

Natural language sentences and discourses translate in DPL to first order predicate logic formulas. Pronouns correspond to individual variables. Sequences of sentences are sequences of conjoined FOL formulas. We can translate the Samoan sentences *sā fa'apāgotā se foamea e Ioane* and *'ua ia ita* in (18b) into the FOL formulas in (20a) and (20b) respectively.

- (20) a. $\exists x : \text{thief}(x) \wedge \text{arrest}(\text{John}, x)$
 b. $\text{angry}(x)$

The variable in (20b) is free and as such (20b) must be interpreted relative to some assignment function *g* which will map *x* to an individual in the model. In DPL, putting two sentences together in a discourse amounts to their coordination, proceeding according to the following rule.

- (21) Dynamic conjunction rule:
 $\langle g, h \rangle \in \llbracket (20a) \wedge (20b) \rrbracket$ iff $\exists k : \langle g, k \rangle \in \llbracket (20a) \rrbracket$ and $\langle k, h \rangle \in \llbracket (20b) \rrbracket$

The rule tells us that the input assignment for the second conjunct is the output assignment from the first conjunct. Assignments are therefore ‘passed’ along from sentence to sentence, continually being updated, narrowing the range of possibilities by which expressions can be valued.

Therefore, to see how the free variable x in (20b) is valued, we have to determine the possible output assignment from its immediately preceding sentence in the discourse, (20a). DPL assigns a special status to an existentially quantified sentence like (20a)—its output assignment must value the bound variable in such a way that the sentence is true (the output assignment must assign x to an individual who is a thief who is arrested by John). The rule for interpreting existentially quantified sentences is below. $h[x]g$ means that the assignment h differs at most from the assignment g by the value it assigns to x .

- (22) Interpreting existentially quantified sentences:
 $\langle g, h \rangle \in \llbracket \exists x : \text{thief}(x) \wedge \text{arrest}(\text{John}, x) \rrbracket$ iff
 $\exists k : k[x]g \wedge \langle k, h \rangle \in \llbracket \text{thief}(x) \wedge \text{arrest}(\text{John}, x) \rrbracket$

The rule amounts to stating that the output assignment sets the variable x to a thief that John arrested. By the rule for dynamic conjunction in (21), the values set in the output assignment are passed along to conjoined sentences, and hence are able to value the free variable x in the second conjunct sentence (20b) to an individual who is both a thief and arrested by John. This has the effect of treating the free variable in (20b) as if it were dynamically bound by the existential quantifier in (20a), and as such the discourse in (18b) is well formed.

By this mechanism, widest scope existential quantification restricts the set of possible values for its bound variable. These values may be passed on to subsequent sentences via the dynamic conjunction rule in (21). However, they are blocked by other kinds of operators, such as negation, implication, disjunction and universal quantification, scoping over the existential quantifier. Embedding a sentence underneath one of these operators therefore makes the sentence *externally static*, unable to license anaphora. The rule for interpreting the externally static operator negation follows below.

- (23) Interpreting negated sentences:
 $\langle g, h \rangle \in \llbracket \neg\phi \rrbracket$ iff $g = h$ and $\neg\exists k : \langle h, k \rangle \in \llbracket \phi \rrbracket$

Negation blocks anaphoric links between expressions in its scope which can potentially antecede pronouns outside its scope. The rule captures this observation by stating that the output assignment h must match the input g . So any values for variables set within the scope of negation are not passed on to subsequent sentences outside its scope. A simple example in (24) is interpreted as in (25). Note $Ext(P)$ means the extension of P . What’s crucial to extract from (25) is that the variables in each sentence are valued by distinct assignments, and therefore the free variable is not treated as dynamically bound by the existential quantifier. By this mechanism, negation blocks the potential of *se* indefinites to bind outside the scope of negation.

- (24) $s\bar{a}$ $l\bar{e}$ $taunu'u$ se_i isi $??s\bar{a}$ ia_i $fiafia$
 PAST NEG arrive NONSPEC one PAST 3SG happy
 ‘No one arrived. He was happy.’

$$(25) \quad \langle g, h \rangle \in \llbracket [\neg\exists x : \text{arrive}(x)] \wedge [\text{happy}(x)] \rrbracket \text{ iff} \\ h = g \text{ and } \neg\exists k : k[x]g \text{ and } k(x) \in \text{Ext}(\text{arrive}) \text{ and } h(x) \in \text{Ext}(\text{happy})$$

DPL defines an operator ! which shifts dynamic sentences into static sentences. Any potential bindings raised by the expressions in a dynamic sentence under the scope of ! will be unable to pass on those bindings to subsequent sentences. The ! operator forces the output assignment of the sentence to match the input assignment.

$$(26) \quad \text{Closure Operator:} \\ \langle g, h \rangle \in \llbracket !\phi \rrbracket \text{ iff } g = h \text{ and } \exists k : \langle h, k \rangle \in \llbracket \phi \rrbracket$$

The ! operator is derivable as double negation, such that ! ϕ is equivalent to $\neg\neg\phi$. We find that scoping ϕ under negation blocks any anaphoric potential of ϕ , and then embedding $\neg\phi$ under a second negation does not reverse this effect. Although ! ϕ and ϕ are non-equivalent in terms of their anaphoric potential, they are equivalent in terms of their truth conditions. They will satisfy the same set of input assignments, but generate a different set of output assignments.

I propose that Samoan *se* DPs and bare NPs instantiate the key DPL distinction between externally dynamic sentences (allowing dynamic binding of cross-sentential anaphora) and externally static sentences (disallowing dynamic binding). We are able to embed a sentence ϕ under the ! operator, blocking its anaphoric potential but not altering its truth conditions. I propose that Samoan bare NPs introduce the ! operator. The discourse in (19b) is interpreted as in (27).

$$(27) \quad \llbracket !\exists x : \text{thief}(x) \wedge \text{arrest}(\text{John}, x) \rrbracket \wedge \llbracket \text{angry}(x) \rrbracket$$

Analysing the discourse with our pre-defined rules, we interpret the discourse as in (28).

$$(28) \quad \langle g, h \rangle \in \llbracket \llbracket !\exists x : \text{thief}(x) \wedge \text{arrest}(\text{John}, x) \rrbracket \wedge \llbracket \text{angry}(x) \rrbracket \rrbracket \text{ iff} \\ h = g \text{ and } \exists k : k[x]h \text{ and } k(x) \in \text{Ext}(\text{thief}) \text{ and } \langle \text{John}, k(x) \rangle \in \text{Ext}(\text{arrest}) \text{ and} \\ \langle h(x) \rangle \in \text{Ext}(\text{angry})$$

As with the negated example in (25), the variables in each sentence are valued by different assignment functions. The function which sets x in the first sentence to a thief arrested by John (k), does not further set x to an angry person. The existential quantifier introduced by the bare indefinite is not able to dynamically bind into a subsequent sentence, being blocked by the ! operator, and is therefore unable to license cross-sentential pronominal anaphora.

With the DPL closure operator in our semantic inventory, a simple alteration of Van Geenhoven's semantic incorporation follows in (29), an example derivation with the verb *catch*. The operation does not only existentially close the first argument of the transitive verb, it also embeds the existential quantifier under the DPL closure operator, thereby restricting its anaphoric potential.

$$(29) \quad \text{Semantic Incorporation with Anaphoric Closure} \\ \text{a. } \llbracket \text{catch} \rrbracket = \lambda x \lambda y. \text{catch}(y, x) \\ \text{b. } \llbracket \text{SI}(\text{catch}) \rrbracket = \lambda P \lambda y. !\exists x : \text{catch}(y, x) \wedge P(x)$$

I suggest that the closure operator effectively captures the differing ways in which the two kinds of Samoan indefinites take narrow scope. The *se* DP introduces simple existential quantification, and, in the absence of any other operator, nothing prevents the existential from binding pronominal anaphora in subsequent sentences. The bare NP behaves as if it were always trapped under the scope of a higher operator. By introducing the closure operator into the lexical semantics of the bare NP, this observation is captured formally.

I will leave a full semantic treatment of *se* DPs and *le* DPs and how they compose with the predicate as open questions for a later version of this work. Their syntactic distribution (occurring in subject, object and oblique positions) is a problem for an analysis employing a type shifter like Van Geenhoven's, which is restricted to operating on the object position of transitive verbs. A potential analysis could be that *se* and *le* both introduce a free variable over choice functions (Reinhart 1997, Winter 1997, Kratzer 1998, Matthewson 1999). The choice function assigns an individual to the predicate denoted by the NP complement. The free choice function variable is then existentially closed. This analysis shares much with Chung and Ladusaw's (2004) treatment of the Māori indefinite determiner *tētahi*, which can freely scope wide or narrow. Chung and Ladusaw propose that the choice function variable introduced by *tētahi* can be existentially closed at a syntactic position below sentential operators (such as negation), or above them, accounting for the variability in scope. Importing this kind of analysis over to Samoan, the choice between *se* and *le* could reflect the position of the existential closure. The choice function introduced by *se* is closed at a position below sentential operators. The choice function introduced by *le* is closed at a position above these operators. In either case, the existential quantifier is not in the scope of the closure operator ! and therefore semantically distinct from the quantifier introduced by bare NPs.

The negated versions of (1a) and (1b) are in (30). Their LFs under a choice function analysis are represented in (31), demonstrating how the existential closure of the function variable is below negation for *se* and above negation for *le*.

- (30) a. *Sā lē tusi e Susana se pese.*
 PAST not write ERG Susana NONSPEC song
 'Susana was not writing any songs.'
- b. *Sā lē tusi e Susana le pese.*
 PAST not write ERG Susana SPEC song
 'Susana was not writing a (certain) song.'

- (31) a. $\neg \exists f : \text{CF}(f) \wedge \text{wrote}(\text{Susana}, f(\text{song}))$
 b. $\exists f : \text{CF}(f) \wedge \neg \text{wrote}(\text{Susana}, f(\text{song}))$

Although the existential quantifier introduced by the bare NP is blocked from binding outside its scope, nothing about the formal system prevents the quantifier from binding within its scope. We therefore expect that bare NPs license pronominal anaphora occurring in a syntactic position in which the closure operator does not block the binding relationship between the existential quantifier and a co-indexed variable. The examples below show that bare NP indefinites in Samoan are able to house bound pronouns within the NP constituent itself.

- (32) a. ‘*Ou te iloa ‘o lo‘o ‘ou fesoasoani e [su‘e [tagata_i ‘ia
 I PRES know PROG I help to search people SUBJECT
 semanu e lē maua le avanoa e fai ai o latou_i galuega]]*
 probable to not get SPEC chance to do there CASE their work
 ‘I know I am helping find people who probably don’t get the chance to have their
 work done.’ (Amanda Pace, *Indexing Mania, New Era, Me*, 2009)
- b. *e [su‘e [ma‘a_i ‘ia togi ‘iai le atigipū‘ū]] pea le*
 PRES search rock SUBJUNCT throw at.it SPEC seashell often SPEC
teine
 girl
 ‘The girl continuously searches for rocks to throw the seashell against it.’

The denotation of the bare NP in (32b) follows in (33a), and the type-shifted transitive verb *su‘e* follows in (33b). The *le* DP, *le atigipū‘ū*, is analysed with the tentative choice function analysis sketched above.

- (33) a. $Ext(\text{ma‘a ‘ia togi le atigipū‘ū}) =$
 $\lambda x.\text{rock}(x) \wedge \text{for-throwing-against}(f(\text{seashell}), x)$
- b. $Ext(\text{SI}(su‘e)) = \lambda P \lambda y. !\exists x : \text{search}(y, x) \wedge P(x)$

Composing the two expressions we derive the meaning for the verb phrase in (34).

- (34) $\lambda y. !\exists x : \text{search}(y, x) \wedge \text{rock}(x) \wedge \text{for-throwing-against}(f(\text{seashell}), x)$

I intend the definition in (29) to contribute to a formal typology of indefinites, where the ability to license cross-sentential anaphora is a delineating factor in classifying varieties of indefinites, above and beyond their quantificational and scopal properties. I do not intend the claim that narrow scope indefinites realised as bare NPs (or morphologically incorporated nouns) cross-linguistically should be interpreted as trapped under the scope of the closure operator. While this seems true in Samoan, the generalisation does not hold cross linguistically. Mithun (1984) shows that Mohawk incorporated nouns may antecede pronominal anaphora, while Massam (2001) shows that bare NPs in Niuean may antecede pronominal anaphora so long as they are adjacent to the existential predicate.

An open question is how the anaphoric closure type-shifter illustrated in (29) (abbreviated as SI_{\exists}) fits into a broader theory of type-shifting. Given that cross-linguistically, bare NP objects are sometimes able to license pronominal anaphora, we may expect those languages to employ the type-shifter originally proposed by Van Geenhoven (1998), that is, simple existential closure of the object argument without any operator blocking the anaphoric potential (abbreviated as SI_{\exists}). Given that the SI_{\exists} shifter is hypothetically available, why does Samoan appear to only employ the SI_{\exists} shifter? I can see two possible responses. First, grammars may select a limited inventory of type-shifters and Samoan idiosyncratically lacks the SI_{\exists} shifter. Therefore, all bare NPs must compose with verbs via the SI_{\exists} shifter. Alternatively, Samoan speakers may have either type-shifter available, and bare NP objects are *prima facie* ambiguous between the externally dynamic and externally static versions. However, the presence of the *se* indefinite gives the speaker an unambiguous means of expressing an externally dynamic

narrow scope indefinite. Therefore, the use of the SI_{\exists} on bare NPs is pragmatically blocked. On encountering a bare NP object, the hearer reasons that the speaker would have used the unambiguous *se* DP if they meant to express a narrow scope indefinite which licenses pronominal anaphora, and thus must have meant to use the SI_{\exists} , which does not have an alternative means of morphosyntactic realisation. This very preliminary, hypothetical discussion requires a lot more exploration, but the two hypotheses do make clearly different predictions. On the former view, interpreting the bare NP as unable to license anaphora is an entailment of its lexical semantics. On the latter view, interpreting the bare NP as unable to license anaphora arises via pragmatic reasoning. We therefore expect it to be cancelled, allowing bare NPs to license anaphora in some extraordinary circumstances. This remains an open question.

Although the semantics for *se* DPs and bare NPs are non-identical, which accounts for their differing discourse behaviour, the analysis retains the central insight that these two kinds of indefinites are truth-conditionally equivalent, both expressing narrow scope existential quantification.

6. Conclusion

In this paper, I investigated the differing semantic properties of three kinds of indefinites in Samoan. In particular, I showed that Samoan bare NPs and DPs headed by the determiner *se* obligatorily take narrow scope with respect to various sentential operators, as well as the inability of Samoan bare NPs to license cross-sentential pronominal anaphora.

I suggest a way of capturing the behaviour of bare NPs in terms of licensing anaphora: I propose that bare NPs in Samoan introduce a non-dynamic existential quantifier. This is formalised within Dynamic Predicate Logic and its closure operator which has the capability of blocking the anaphoric potential of dynamic sentences. The compositional semantics is set up in such a way that the existential quantifier introduced by the indefinite is permanently blocked by this closure operator. The operator has the additional property of leaving the truth conditional content of the sentence unaltered, accounting for the truth conditional equivalence of the two varieties of Samoan narrow scope indefinites.

I intend this research to build toward a finer-grained comparative typology of indefinites cross-linguistically. Towards this I formalise a particular property by which indefinites often differ cross-linguistically, namely, their potential to enter into anaphoric relations.

Appendix: Formal System — Dynamic Predicate Logic (Groenendijk and Stokhof 1991)

Let \mathbb{L} be an ordinary first order logic with n -place predicates, individual constants and variables. A model is a pair $\langle D, Ext \rangle$, where D is a domain of individuals, and Ext is an interpretation function mapping non-logical individual constants in \mathbb{L} to into D , and n -place predicates into subsets of D^n . An assignment function g maps variables to individuals in D such that $g(x) \in D$. G is the set of all possible mappings of variables to individuals. Let ϕ be a sentence in \mathbb{L} , $[[\phi]]^M \subseteq G \times G$. Notation: $!$ abbreviates \neg , $g[x]h$ means h differs from g at most by the individual assigned to x .

Semantics:

$\langle g, h \rangle \in \llbracket Rt_1, \dots, t_n \rrbracket^M$	iff	$h = g$ and $\langle h(1), \dots, h(n) \rangle \in Ext(R)$
$\langle g, h \rangle \in \llbracket t_1 = t_2 \rrbracket^M$	iff	$h = g$ and $h(1) = h(2)$
$\langle g, h \rangle \in \llbracket \neg\phi \rrbracket^M$	iff	$h = g$ and $\neg\exists k : \langle h, k \rangle \in \llbracket \phi \rrbracket^M$
$\langle g, h \rangle \in \llbracket \phi \wedge \psi \rrbracket^M$	iff	$\exists k : \langle g, k \rangle \in \llbracket \phi \rrbracket^M$ and $\langle k, h \rangle \in \llbracket \psi \rrbracket^M$
$\langle g, h \rangle \in \llbracket \phi \vee \psi \rrbracket^M$	iff	$h = g$ and $\exists k : \langle h, k \rangle \in \llbracket \phi \rrbracket^M$ or $\langle h, k \rangle \in \llbracket \psi \rrbracket^M$
$\langle g, h \rangle \in \llbracket \phi \rightarrow \psi \rrbracket^M$	iff	$h = g$ and $\forall k : \langle h, k \rangle \in \llbracket \phi \rrbracket^M \Rightarrow \exists j : \langle k, j \rangle \in \llbracket \psi \rrbracket^M$
$\langle g, h \rangle \in \llbracket \exists x\phi \rrbracket^M$	iff	$\exists k : k[x]g$ and $\langle k, h \rangle \in \llbracket \phi \rrbracket^M$
$\langle g, h \rangle \in \llbracket \forall x\phi \rrbracket^M$	iff	$h = g$ and $\forall k : k[x]h \Rightarrow \exists j : \langle k, j \rangle \in \llbracket \phi \rrbracket^M$
$\langle g, h \rangle \in \llbracket !\phi \rrbracket^M$	iff	$h = g$ and $\exists k : \langle h, k \rangle \in \llbracket \phi \rrbracket^M$

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