

Composition and opacity without articles: A case study in Tagalog

1. Introduction. Type-shifters play an important role in accounting for how definiteness arises compositionally, particularly in article-free languages. But how are NP interpretations in such languages constrained? This paper argues that in Tagalog, type-shifter meanings are not instantiated by (in)definite articles, but rather within verbal affixes, which constrain the possible types of NP arguments the verb may compose with, deriving (in)definite interpretations in semantic composition. The system expands the cross-linguistic space of possibilities of how applications of type-shifters are morphosyntactically signalled: within an article system (as in English) or with verbal morphology (as in Tagalog).

Tagalog transitive roots like *tago* ('hide') may take either patient-voice (PV) (1) or actor-voice (AV) (2) morphology, which promotes the thematic agent or patient (respectively) to subject-hood. Bare NP patients of PV verbs are always definite (1), while patients of AV verbs are unambiguously indefinite (2).

- | | |
|---|--|
| <p>(1) <i>t<in>ago ko ang kompyuter</i>
 ⟨PV⟩.PERF.hide GEN.1SG NOM computer
 I hid the computer.</p> | <p>(2) <i>nagtago ako ng kompyuter</i>
 AV.PERF.hide NOM.1SG GEN computer
 I hid a computer.</p> |
|---|--|

The patients in (1-2) are morphosyntactically bare NPs (NB: *ang/ng* are case markers, not articles (Himmelman 2005, Foley 2007 a.o.)), interpreted as property-types, their definiteness being signalled by the PV/AV affixes on the verb.

2. Patient Voice. I propose that Tagalog transitive verbal roots are relations between individuals and properties (3a), but take on familiar verbal denotations via combination with affixes including PV/AV. The function of the PV-morpheme in (1) is to shift the root's meaning to an individual relation, forcing the patient NP to be interpreted as *e*-type. The PV-morpheme is an overt instantiation of (a generalized version of) Montague's (1974) BE (3b), lowering the root's type to an ⟨*e, et*⟩-type (3c).

- (3) a. $tago \rightsquigarrow \lambda P \lambda x. \exists y [P(y) \wedge \mathbf{hide}(x, y)]$ b. $-in- \rightsquigarrow \lambda f \lambda y \lambda x. f(\lambda z. z = y)(x)$
 c. $t\langle in \rangle ago \rightsquigarrow \lambda y \lambda x. \exists z [z = y \wedge \mathbf{hide}(x, z)]$

Bare NP patients of PV-verbs are interpreted as definite (1). I propose this is due to a type mismatch between ⟨*e, et*⟩-type PV-verbs (3c), and ⟨*e, t*⟩-type bare NPs (4a), which is resolved by lowering the bare NP via Partee's *iota*, deriving a definite interpretation (presupposing existence and uniqueness).

- (4) a. $ang\ kompyuter \rightsquigarrow \mathbf{computer}$ b. $iota(ang\ kompyuter) \rightsquigarrow \iota(\mathbf{computer})$
 c. $t\langle in \rangle ago(iota(ang\ kompyuter)) \rightsquigarrow \lambda x. \exists z [z = \iota(\mathbf{computer}) \wedge \mathbf{hide}(x, z)]$

As Tagalog does not lexicalize a definite article (i.e., an overt *ι*-operator), covert *ι*-application of bare NPs is not blocked by principle (5) (Chierchia 1998:360) which prevents covert application of type-shifters when the language supplies a morphologically overt version.

- (5) *Blocking Principle:* For any type shifting operation τ and any X : $*\tau(X)$ if there is a determiner D such that for any set X in its domain, $D(X) = \tau(X)$.

However the principle (5) does block application of covert type-shifting *ang kompyuter* in (1) by Partee's (1987) *A/EX* operator ($\lambda P \lambda Q. \exists x [P(x) \wedge Q(x)]$) which derives an existential quantifier meaning for bare NPs, as *A/EX* is lexicalized in Tagalog by the cardinal numeral *isang*.

Patient NPs of PV-verbs may be overtly quantified by quantificational determiners including *isang*. Here, the patient NP is a GQ type (6a) and combines with the PV-verb via quantifying in (Montague 1974) (6b). The GQ-type patient is the wrong type for *iota* to apply, and thus the definite interpretation does not arise, despite PV. Thus, a PV-verb's type (3c) composes with GQ arguments, including indefinites, without type-shifting, but forces bare NPs to lower via *iota*, only deriving definiteness in the latter case. With quantificational patient NPs like (6a), an indefinite reading may emerge with a PV-verb.

- (6) a. *ang isang kompyuter* $\rightsquigarrow \lambda P.\exists x[\mathbf{computer}(x) \wedge P(x)]$
 b. *t<in>ago ang isang kompyuter* $\rightsquigarrow \lambda x.\exists y[\mathbf{computer}(y) \wedge \exists z[z = y \wedge \mathbf{hide}(x,z)]]$

3. Actor voice. Bare NP patients of AV-verbs are unambiguously indefinite (2). I propose the AV-morpheme is an existential quantifier over sub-concepts of the property introduced by the bare NP patient (7b). The resulting VP meaning (7e) states that there is a patient individual which instantiates a sub-concept of the bare NP meaning. The existential quantification of the patient is supplied by the verbal root, correctly predicting the patient is interpreted non-specifically, with narrow scope with respect to higher operators such as negation. The sub-concept relation $P \sqsubseteq Q$ abbreviates $\forall w \in W[P(w) \subseteq Q(w)]$.

- (7) a. *tago* $\rightsquigarrow \lambda P\lambda x.\exists y[P(y) \wedge \mathbf{hide}(x,y)]$ b. *nag-* $\rightsquigarrow \lambda f\lambda Q\lambda x.\exists P[P \sqsubseteq Q \wedge f(P)(x)]$
 c. *nagtago* $\rightsquigarrow \lambda Q\lambda x.\exists P[P \sqsubseteq Q \wedge \exists y[P(y) \wedge \mathbf{hide}(x,y)]]$ d. *ng kompyuter* $\rightsquigarrow \mathbf{computer}$
 e. *nagtago(ng kompyuter)* $\rightsquigarrow \lambda x.\exists P[P \sqsubseteq \mathbf{computer} \wedge \exists y[P(y) \wedge \mathbf{hide}(x,y)]]$

The import of quantification over sub-concepts is more evident with intensional transitive verbs (ITVs) such as *hanap* ‘search’. Bare NP patients of AV ITVs in Tagalog are always interpreted non-specifically: they suspend the normal existential commitment of patient NPs, they resist substitution of co-extensional patient NPs, and they support upward monotonicity inferences as in (8).

- (8) *naghanap* *ako* *ng* *itim na sinturon* \models *naghanap* *ako* *ng* *sinturon*
 AV.PERF.search NOM.1SG GEN black belt AV.PERF.search NOM.1SG GEN belt
 I looked for a black belt. I looked for a belt

Following Quine 1960, an ITV like *hanap* ‘search’, semantically decomposes into an extensional predicate **find** embedded under an attitude **try**. The existential quantifier introduced by the root’s meaning is embedded beneath **try**, deriving the lack of existential commitment (9a). Following Zimmermann 2006 in assuming a non-monotonic semantics for **try**, the existential quantification over sub-concepts by the AV morpheme preserves the upward monotonicity of the patient position ((9e) \sqsubseteq (9f)).

- (9) a. *hanap* $\rightsquigarrow \lambda P\lambda x.\mathbf{try}(x, \exists y[P(y) \wedge \mathbf{find}(x,y)])$ b. *nag-* $\rightsquigarrow \lambda f\lambda Q\lambda x.\exists P[P \sqsubseteq Q \wedge f(P)(x)]$
 c. *naghanap* $\rightsquigarrow \lambda Q\lambda x.\exists P[P \sqsubseteq Q \wedge \mathbf{try}(x, \exists y[P(y) \wedge \mathbf{find}(x,y)])]$ d. *ng sinturon* $\rightsquigarrow \mathbf{belt}$
 e. *naghanap(ng itim na sinturon)* $\rightsquigarrow \lambda x.\exists P[P \sqsubseteq (\mathbf{black} \sqcap \mathbf{belt}) \wedge \mathbf{try}(x, \exists y[P(y) \wedge \mathbf{find}(x,y)])]$
 f. *naghanap(ng sinturon)* $\rightsquigarrow \lambda x.\exists P[P \sqsubseteq \mathbf{belt} \wedge \mathbf{try}(x, \exists y[P(y) \wedge \mathbf{find}(x,y)])]$

As AV-verbs only accept property-type arguments (9c), the analysis correctly predicts they may not combine with *e*-type arguments, such as pronouns, proper names or definite readings of bare NPs (10).

- (10) **naghanap* *ako* *niya/ni Juan/ng sinturon*
 AV.PERF.search NOM.1SG GEN.him/GEN Juan/GEN belt
 I looked for him/Juan/*the belt

4. Conclusion. In Tagalog, morphosyntactically bare NPs inherit (in)definite interpretations via type-shifting, but the range of interpretations is constrained by verbal morphology: namely an instantiation of Montague’s BE in the verbal domain (PV), and a quantifier over sub-concepts (AV). The paper provides a compositional semantics for linguistic systems which lack articles, but load morphosyntactic signalling of NP-interpretations onto the verb. Type-shifters, whether instantiated as articles or verbal affixes, allow for cross-linguistic semantic unity, even with very different morphosyntactic signalling.

References: Chierchia 98, Reference to kinds across languages, *NALS*. Montague 74, PTQ, *Approaches to Natural Language*. Partee 87, Noun phrase interpretation and type-shifting principles, *Studies in DRT*. Quine 60, *Word and Object*. Zimmermann 06, Monotonicity in opaque verbs, *L&P*