Mental states via possessive predication: The grammar of possessive experiencer complex predicates in Persian*

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Abstract

Persian possesses a number of stative complex predicates with dâshtan 'to have' that express certain kinds of mental state. I propose that these *possessive experiencer complex predicates* be given a formal semantic treatment involving possession of a portion of an abstract quality by an individual, as in the analysis of property concept lexemes due to Francez & Koontz-Garboden (2015; 2016; 2017). Augmented with a compositional regime of restriction and existential closure (Chung & Ladusaw, 2003), the analysis explains various properties of possessive experiencer complex predicates, including the ability of the non-verbal element to be modified by a range of adjectives, the direct participation of the non-verbal element in comparative constructions, the behavior of prepositional phrases denoting the target of the mental state in and outside of complex predicates, and the ability of degree expressions to modify both the non-verbal element and the VP containing the complex predicate. Theoretically, the analysis ties transitive mental state expressions to the grammar and semantics of property concept sentences, which are expressed via possessive morphosyntax cross-linguistically, and connects with syntactic proposals that independently argue for a universal underlyingly possessive morphosyntax for mental state predicates (Noonan 1992; Hale & Keyser 2002). The work here also motivates modifications to Francez and Koontz-Garboden's original proposal, and opens new questions in the original

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empirical domain of the analysis of possessive predicating strategies for the expression of property concept sentences.

1 Introduction

It is common cross-linguistically for *property concept sentences*, the translational equivalents of English predicative adjectival sentences, to be expressed morphosyntactically via possession of an abstract noun (Dixon 1982; Francez and Koontz-Garboden 2015; Baglini 2015; Francez and Koontz-Garboden 2017; Hanink et al. 2019). Such *possessive predicating* strategies for the expression of property concept sentences have been noted and analyzed in a variety of languages, such as Ulwa (Koontz-Garboden and Francez, 2010; Francez and Koontz-Garboden, 2017), Hausa (Newman, 2000; Francez and Koontz-Garboden, 2017), and Wolof (Baglini, 2015), Basaá (Hanink et al., 2019), and Washo (Hanink and Koontz-Garboden, 2021), among others. To give just one example, the majority of property concept sentences in Hausa are formed through a combination of the preposition *da* 'with' with an *abstract noun of sensory quality*, such as *karfi* 'strength,' yielding sentences like ((1)) to express that proposition 'we are strong.' Crucially, *da* is also used in the language to express possession more generally, hence its designation as a language with a possessive predicating strategy for the expression of property concept sentences.

(1) Hausa (Newman, 2000)

a. muna **da** karfi
1.PL.CONT with strength
'We are strong.' (lit. we are with strength)

b. yarinya tana **da** zobe
girl 3.SG.FEM.CONT with ring
'The girl has a ring.' (lit. the girl is with a ring)

Previous work on possessive predication in the grammar of property concept sentences has focused on the translational equivalents of adjectives, as many languages with a small, closed (or non-existent) class of adjectives make use of the possessive predicating strategy (Dixon, 1982; Francez and Koontz-Garboden, 2017). However, one can ask similar questions about the expression of properties by lexical categories other than adjectives. For instance, Baglini (2015) and Francez and Koontz-Garboden (2017) point out that the grammar of Wolof groups possessive predicating property concept lexemes with non-possessive predicating *stative verbs*, both intransitive and transitive. The authors of these works conclude that both types of expression have denotations built from the same ontology. We thus

might expect to find languages with possessive predicating strategies for the expression of transitive statives, especially in languages with a small, closed class of verbs.

In this paper, I examine the use of possessive predication in Persian to express a range of *mental states*, serving as the translational equivalents of transitive stative verbs in English. In Persian, a language with a small, closed class of verbs, the majority of mental state predicates are expressed via a combination of the possessive verb *dâshtan* and an abstract noun naming the particular mental state. For example, the translational equivalents of the English stative verbs *love* and *hate* are expressed by *eshgh dâshtan* and *nefrat dâshtan*, literally 'to have love' and 'to have hatred,' respectively, as in (2).

(2) a. man be shahr =am eshgh dâr -am
1.SG to city =1.SG love have.prs -1.SG
'I love my city.'
(lit. I have love toward my city)

b. Ali az Hasan nefrat dâr -e
Ali from Hasan hatred have.prs -3.SG
'Ali hates Hasan.' (lit. Ali has hatred of Hasan)

I propose that these *possessive experiencer complex predicates* be analyzed as involving *possession of a portion of an abstract quality by an individual*, as in Francez and Koontz-Garboden's (2015; 2016; 2017) analysis of property concept sentences. Augmented with a compositional regime of restriction and existential closure (Chung and Ladusaw, 2003), the analysis explains various properties of possessive experiencer complex predicates, including the ability of the possessed nominal to be modified by a range of adjectives, the direct participation of the nominal in comparative constructions, the distribution of prepositional phrases denoting the *target* of the mental state in and outside of complex predicates, and the ability of degree morphemes and other modifiers to attach at both the nominal and VP level with the same meaning.

Theoretically, the analysis ties mental state predicates to the grammar and semantics of property concept sentences: mental state nominals are property concept lexemes describing *human propensities* in Dixon's 1982 sense, and likewise pattern with other quality nouns not only in Persian, but also in other languages, including English. Moreover, possessive predicating strategies for mental state predicates exist in languages, other than Persian, such as Sorani Kurdish and Irish, suggesting a broader cross-linguistic applicability of the proposal. In the context of Persian, the analysis also connects to the compositional semantics of pseudo-incorporated noun phrases (Chung and Ladusaw, 2003; Modarresi and Krifka, 2021), of which the nominal component of possessive experiencer complex predicates is an example. Finally, an adequate account of the phenomena reported here motivates modifications to Francez and Koontz-Garboden's original proposal for the anal-

ysis of property concept sentences, and opens new questions in the original empirical domain of possessive predication in such sentences, particularly concerning the extent of the modifiability and compositional flexibility of quality-denoting nominals.

The paper is structured as follows. Section 2 contains background on the Persian language, including a discussion of complex predicates. Section 3 introduces the primary empirical focus of the paper, what I call possessive experiencer complex predicates, which make use of a possessive-predicating strategy for expressing a variety of mental state predicates, and details some of their noteworthy properties. Section 4 develops an analysis of possessive experiencer complex predicates as possessed property concepts, building on Francez and Koontz-Garboden's analysis of possessed property concept lexemes cross-linguistically, and demonstrates how such an analysis explains the core properties detailed in section 3. Section 5 details predictions of the analysis that go beyond the phenomena the analysis was designed to explain, and shows that these predictions are borne out. Section 6 considers the implications of the proposal beyond Persian by demonstrating that mental state nouns pass a number of diagnostics proposed for quality nouns by Francez and Koontz-Garboden (2017). This section also provides evidence for the existence of possessive predicating strategies for the expression of mental state predicates in languages other than Persian, with analogous phenomena occurring in Sorani Kurdish and the Celtic languages Irish and Scottish Gaelic, and considers an analysis of English-like mental state verbs constructed from the ingredients of the analysis of the Persian phenomena discussed throughout the paper. Section 7 concludes the paper by taking stock and discussing avenues for future research.

2 Background on Persian

Persian (also known as *Farsi*) is a Southwestern Iranian language (Indo-European), spoken in Iran, Afghanistan, and Tajikistan as an official language. It exhibits thorough nominative-accusative alignment with differential object marking of specific NPs. The basic word order is SOV, but is otherwise head-initial: the language has prepositions rather than postpositions, nouns precede adjectives in the NP, and embedded clausal complements follow the head verb or noun. Verbs have distinct past and present tense stems. The past tense stem is predictable from the infinitive (*didan* 'to see' $\rightarrow$ *did* 'saw (3.sg)') but the present stem is usually unpredictable (***did****am* 'I saw,' but *mi****bin****am* 'I see'). (3), (4), and (5) illustrate a few of these properties.

(3) man Mohsen -o mi- bin -am
1.SG Mohsen -DOM IMPV- see.PRS -1.SG
'I see Mohsen.'

(4) mâ be Simin goft -im ke panir -o bo- xor -e
1.PL to Simin say.PST -1.PL that cheese -DOM sbjv- eat.PRS -3.SG
'We told Simin to eat the cheese.'

(5) mard -i ke diruz did -am fârsi balad -e
man -IND that yesterday see.PST -1.SG Persian adept -3.SG.COP.PRS
'The man I saw yesterday speaks Persian.'

Persian has several distinct varieties, partially depending on which country it is spoken in: the main varieties are Iranian Persian, Afghan Persian (Dari), and Tajiki Persian (Tajik) (Karimi, 2005; Jasbi, 2015).[1] Moreover, Persian is diglossic: many differences exist between the formal language and the colloquial language, and include differences in agreement suffixes of verbs, nominal suffixes, and systematic differences in pronunciation (Jasbi, 2015). The Persian sentences and judgments reported in this paper, unless otherwise noted, come from elicitation sessions conducted by the author with three native speakers of colloquial Iranian Persian, and it is this variety that I will refer to simply as *Persian* throughout this paper.

2.1 Possession and the *ezâfe* construction

Persian has a possessive verb, *dâshtan* 'to have.' It is mostly used the way 'have' is used in English, namely, to express possession, whether alienable or inalienable.[2]

(6) ye xâhar dâr -am
a sister have.PRS -1.SG
'I have a sister.'

(7) do tâ chashm -e siyâh dâr -i
two CL eye -EZ black have.PRS -2.SG
'You have two black eyes.'

(8) ye ketâb dâr -am
a book have.PRS -1.SG

[1] Larson and Samiian (2020) refer to the three main dialect groups of Persian as iPersian, aPersian, and tPersian, respectively. As I will not be comparing different varieties of Persian in this paper, I do not make use of this terminology here.

[2] *dâshtan* has an additional, unrelated use as a marker of progressive aspect (Taleghani, 2010).

(i) dâr -am ye nâme be dust =am mi- nevis -am
have.PRS -1.SG a letter to friend =1.SG IPFV- write.PRS -1.SG
'I am writing a letter to my friend.'

'I have a book.'

For possession within the noun phrase, Persian makes use of the *ezâfe* (lit. addition) construction. The *ezâfe* morpheme surfaces as *-e* after consonants and *-ye* after vowels. *Ezâfe* is insensitive to the distinction between alienable and inalienable possession: an *ezâfe* morpheme is obligatory regardless.

(9) dast -hâ -ye Sohrâb
hand -PL -EZ Sohrab
'Sohrab's hands'

(10) pirhan -e Sohrâb
shirt -EZ Sohrâb
'Sohrab's shirt'

Ezâfe is used for both possession within the NP and more generally for modification of a noun by both adjectives as well as by other nouns. If there are multiple adjectives or nouns within an NP, an *ezâfe* vowel appears between each one.

(11) Rahâ ye sag -e kuchik did -∅
Raha a dog -EZ small see.PST -3.SG
'Raha saw a small dog.'

(12) xâhar -e Mohsen zabânshenâsi mi- xun -e
sister -EZ Mohsen linguistics IMPV- read.PRS -3.SG
'Mohsen's sister is studying linguistics.'

(13) mo'allem -e pir -e dust -e man fârsi balad -e
teacher -EZ old -EZ friend -EZ 1.SG Persian knowing -3.SG
'My friend's old teacher speaks Persian.'

Several analyses exist of the *ezâfe* construction, ranging from treating it as a marker of Case on +N elements (Samiian, 1994; Larson and Samiian, 2020), a marker of agreement triggered after roll-up movement (Kahnemuyipour, 2014), and a linker affixed to heads at PF (Ghomeshi, 1997). I will take no stance on the correct analysis of *ezâfe*, and though I will generally take it to be semantically vacuous, nothing hinges on this choice. My goal is simply to flag its existence and describe its properties for readers not familiar with Persian, as *ezâfe* will appear throughout examples featuring nominal modification in this paper.

2.2 Complex predicates

While Persian possesses an open class of nouns and adjectives, verbs form a *closed class*: there are only around 115 simplex verbs in the language (Khanlari, 1973; Mohammad and Karimi, 1992), and new members cannot be freely added to the category. To compensate for its relatively small inventory of verbs, Persian makes heavy use of *complex predicates*, also known as *light verb constructions* and *compound verbs*. Complex predicates involve a combination of a simplex verb, termed the *light verb*, and a noun, adjective, or prepositional phrase, termed the *non-verbal element*, or *NVE* (Dabir-Moghaddam, 1995; Karimi, 1997; Folli et al., 2005; Karimi-Doostan, 2011). Common light verbs in Persian include *kardan* 'to do/make,' *shodan* 'to become,' *zadan* 'to hit,' *xordan* 'to collide,' *dâdan* to give,' and *dâshtan* 'to have,' among others. The examples below provide examples of complex predicates with a variety of light verbs and NVE types.

(14) Hâmed gerye mi- kard -∅
Hamed weeping IMPV- do.PST -3.SG
'Hamed was crying.' (lit. Hamed was doing weeping)

(15) Ali zamin xord -∅
Ali ground collide.PST -3.SG
'Ali fell.' (lit. Ali collided ground)

(16) man Mohsen -o laghat zad -am
1.SG Mohsen -DOM kick hit.PST -1.SG
'I kicked Mohsen.' (lit. I hit kick Mohsen)

(17) man dar -o bâz kard -am
1.SG door -DOM open do.PST -1.SG
'I opened the door' (lit. I made the door open)

(18) nâm =esh -o be yâd ne- mi- âr -am
name =3.SG -DOM to memory NEG- IPFV- bring.PRS -1.SG
'I can't remember his name.' (lit. I do not bring his name to memory)

Complex predicates may be *compositional*, in which case the meaning of the entire complex predicate is predictable from the meanings of the light verb and NVE (Karimi, 1997; Folli et al., 2005; Karimi-Doostan, 2011). They can also be *idiomatic*, in which case the meaning of the complex predicate does not clearly follow from the meaning of its components. The distinction between compositional and idiomatic complex predicates has grammatical consequences. Importantly for the purposes of this paper, the NVE of compositional complex predicates can be modified using the *ezâfe* construction, as in (19) and (20).

(19) Kimea che zamin -e saxt -i diruz xord -∅
Kimea what ground -EZ hard -IND yesterday collide.PST -3.SG
'How hard Kimea fell yesterday.' (lit. Kimea collided (with) what hard ground yesterday) (Karimi 1997)

(20) Kimea az ra'is -e edâre da'vat -e rasmi kard -∅
Kimea from boss -EZ office invitation -EZ formal do.PST -3.SG
'Kimea formally invited the boss of the office.' (lit. Kimea did a formal invitation of the boss of the office) (Karimi 1997)

Idiomatic complex predicates, on the other hand, do not permit the modification of their NVE. For example, the complex predicate *dust dâshtan* 'to like, love' (lit. have friend) does not permit modification of its NVE.

(21) *man Mohsen -o dust -e ajib -i dâr -am
1.SG Mohsen -DOM friend -EZ strange -IND have.PRS -1.SG
Intended: 'I strangely like Mohsen.' (lit. I have strange friend Mohsen)

3 Mental state predicates via possessive complex predicates

The complex predicate strategy extends as well to verbs expressing mental states. Specifically, a number of expressions that act as translational equivalents of English mental state verbs occur with the verb *dâshtan* 'to have.' (22) provides a non-exhaustive list of such *possessive experiencer complex predicates*.

(22) Possessive experiencer complex predicates in Persian
a. *eshgh dâshtan* 'to love' (lit. to have love)
b. *nefrat dâshtan* 'to hate' (lit. to have hatred)
c. *e'temâd dâshtan* 'to trust' (lit. to have trust)
d. *vahshat dâshtan* 'to be terrified' (lit. to have terror)
e. *alâghe dâshtan* 'to be interested in' (lit. to have interest)
f. *bâvar/e'teqâd dâshtan* 'to believe' (lit. have belief)
g. *niyâz/ehtiâj dâshtan* 'to need' (lit. have need)

These complex predicates occur with an NP possessor acting as the *experiencer* of the mental state. The individual the experiencer bears the mental state toward, which I will refer to as the *target* of the mental state, is introduced by a prepositional phrase, headed either by *be* 'to' or *az* 'from, of,' depending on the particular mental state nominal acting

as the NVE.

(23) man be shahr =am eshgh dâr -am
1.SG to city =1.SG love have.prs -1.SG
'I love my city.'
(lit. I have love toward my city)

(24) Maryam be elm alâghe dâr -e
Maryam to science interest have.PRS -3.SG
'Maryam is interested in science.'
(lit. Maryam has interest toward science)

(25) beh =et e'temâd dâr -am
to =2.SG trust have.PRS -1.SG
'I trust you.' (lit. I have trust toward you.)

(26) Ali az Hasan nefrat dâr -e
Ali from Hasan hatred have.prs -3.SG
'Ali hates Hasan.'
(lit. Ali has hatred of Hasan)

(27) man az shir vahshat dâr -am
1.SG from lion terror HAVE.PRS -1.SG
'I am terrified of lions.' (lit. I have terror of lions)

(28) be xodâ e'teghâd dâr -am
to God belief have.PRS -1.SG
'I believe in God.' (lit. I have belief toward God)

(29) beh =et niyâz dâr -am
to =2.SG need have.PRS -1.SG
'I need you.' (lit. I have need toward you)

Possessive experiencer complex predicates are compositional rather than idiomatic in Karimi's (1997) sense. This can be seen from the fact that the NVE can be modified by a range of adjectives by means of the *ezâfe* construction. Adjectives that may modify the NVE include *ajib* 'strange,' *shadid* 'intense,' and *kâmel* 'complete,' among others.

(30) az shir vahshat -e ajib -i dâr -am
from lion terror -EZ ajib -INDEF have.PRS -1.SG
'I am strangely terrified of lions.' (lit. I have a strange terror of lions)

(31) be shahr =am eshgh -e shadid -i dâr -am
to city =1.SG love -EZ intense -INDEF have.PRS -1.SG

'I intensely love my city.' (lit. I have intense love toward my city)

(32) beh =et e'temâd -e kâmel dâr -am
to =2.SG trust -EZ complete have.PRS -1.SG
'I trust you completely.' (lit. I have complete trust toward you.)

(33) be xodâ e'teghâd -e râsekh dâr -am
to God belief -EZ firm have.PRS -1.SG
'I firmly believe in God.' (lit. I have a firm belief toward God)

Moreover, the NVE of these complex predicates is *gradable*: the complex predicates in (22) above can be modified by *ziyâd* 'much,' intuitively referring to the "size" of the mental state.

(34) Maryam be elm alâghe -ye ziyâd -i dâr -e
Maryam to science interest -EZ much -IND have.PRS -3.SG
'Maryam is very interested in science.' (lit. Maryam has much interest toward science.)

(35) Royâ az Hasan nefrat -e ziyâd -i dâr -e
Roya of Hasan hatred -EZ much -IND have.PRS -3.SG
'Roya hates Hasan a lot.' (lit. Roya has much hatred of Hasan.)

It is also possible to express *comparison* with possessive experiencer complex predicates by directly modifying the non-verbal element with the comparative *bishtar* 'more.' The expression of comparison in this way is completely productive: all of the complex predicates in (22) can be directly modified by *bishtar*. The standard of comparison is introduced by *tâ*, literally 'until,' which is used more generally with clausal comparison.[3]

(36) az Ali nefrat -e bishtar -i dâr -am tâ (az) Hasan
from Ali hatred -EZ more -INDEF have.PRS -1.SG until from Hasan
'I hate Ali more than I do Hasan' (lit. I have more hatred of Ali than I do of Hasan)

(37) be shahr =esh eshgh -e bishtar -i dâr -e tâ (be) keshvar =esh
to city =3.SG love -EZ more -INDEF have.PRS -3.SG until to country =3.SG
'He loves his city more than he does his country.' (lit. He has more love toward

[3]Persian is also able to express the standard of comparison with the preposition *az* 'from.' My consultants preferred the use of *tâ* here, in part due to the difficulty of processing sentences with both standard-marking *az* and the target prepositional phrase, itself sometimes headed by *az*.

his city than he does toward his country)

(38) Maryam be elm alâghe -ye bishtar -i dâr -e tâ (be)
Maryam to science interest -EZ more -INDEF have.PRS -3.SG until to
din
religion
'Maryam is more interested in science than I am in religion' (lit. Maryam has more interest toward science than she does toward religion)

(39) be to e'temâd -e bishtar -i dâr -am tâ (be) Maryam
to 2.SG trust -EZ more -INDEF have.PRS -1.SG until to Maryam
'I trust you more than I do Maryam' (lit. I have more trust toward you than I do toward Maryam)

An analysis of possessive experiencer complex predicates should explain the ability of the non-verbal element to be modified by adjectives as an independent nominal, and should also account for its gradability. In addition to this, an ideal account would tie the analysis into a broader class of phenomena cross-linguistically.

4 Possessive experiencer complex predicates as possessed property concepts

In what follows, I lay out an analysis of possessive experiencer complex predicates in Persian in terms of Francez and Koontz-Garboden's (2010; 2015; 2016; 2017) approach to *property concept lexemes* (see also Hanink et al. 2019; Hanink and Koontz-Garboden 2021). I will begin by discussing Francez & Koontz-Garboden's results, and proceed by extending and modifying their approach to explain the phenomena discussed above.

4.1 Possessive predicating strategies in property concept sentences

Francez & Koontz-Garboden observe that, cross-linguistically, property concept sentences, translational equivalents of what in English are expressed as predicative adjectival sentences, are often expressed via possession of an abstract mass noun, what they refer to as a *possessive predicating* strategy. Different languages may make use of a variety of possessive predicating strategies, including a nominal possessive strategy (Ulwa, (40)), a prepositional strategy (Hausa, (41)), or a verbal strategy (Wolof, (42)), among others. Crucially, the strategy used to express property concepts in these languages is the same strategy the language uses for possession more generally, as can be seen in the (b) sentences below.

(40) Ulwa (Francez and Koontz-Garboden 2010; 2015; 2016; 2017)

a. yang as-kina minisih -**ka**
1.SG shirt-<1.SG.POSS> dirtiness -3.SG.POSS
'My shirt is dirty.' (lit. My shirt has dirtiness)

b. Alberto pan -**ka**
Alberto stick -3.SG.POSS
'Alberto's stick.'

(41) Hausa (Newman, 2000)

a. muna **da** karfi
1.PL.CONT with strength
'We are strong.' (lit. we are with strength)

b. yarinya tana **da** zobe
girl 3.SG.FEM.CONT with ring
'The girl has a ring.' (lit. the girl is with a ring)

(42) Wolof (Baglini, 2015)

a. Awa **am** -na -∅ xel
Awa have -FIN -3.SG mind
'Awa is smart.' (lit. Awa has mind.)

b. Aïda **am** na -∅ ceeb
Awa have FIN -3.SG rice
'Aida has rice.'

Francez & Koontz-Garboden develop an account of this phenomenon that takes the surface morphosyntax seriously. On their approach, the abstract noun denotes a set of *portions of abstract qualities*, themselves a subsort of individual. These qualities are mass entities ordered by two relations: a *partial order* interpreted as the *parthood* relation (Link, 1983), and a total pre-order that intuitively expresses the *size* of the portion of the quality in question. Finally, the possessive morphosyntax serves to existentially close the quality variable and relate it to an individual (the possessor) via the possessive relation π. To illustrate, the Wolof sentence in (42) is analyzed as in (43): *xel* 'mind' is a predicate of portions of the quality MIND. *am* 'have' existentially closes the property variable and relates it to an individual via π.

(43) a. $xel \rightsquigarrow \lambda p.\text{MIND}(p)$

b. $am \rightsquigarrow \lambda P.\lambda x.\exists p[P(p) \wedge \pi(x,p)]$

c. $[\![(42)]\!] = \exists p[\text{MIND}(p) \wedge \pi(\text{awa},p)]$

One can immediately appreciate the similarities with the Persian phenomena discussed

above: these also involve a possessive predicating strategy for expressing a state. Crucially, *dâshtan* is used for possession more generally in Persian.

(44) a. Rostam do tâ ketâb dâr -e
Rostam two CL book have.PRS -3.SG
'Rostam has two books.'
b. man ye xâhar -e kuchik dâr -am
1.SG a sister -EZ little have.PRS -1.SG
'I have a little sister.'

4.2 A possessive predicating analysis of possessive experiencer complex predicates

I propose that the possessed property concept analysis be extended to Persian possessive experiencer complex predicates. On my proposal, as in Francez & Koontz-Garboden's, the non-verbal element is a quality noun, and denotes a set of *portions of an abstract quality* corresponding to the mental state experienced. (45) demonstrates this analysis for *alâghe*.

(45) *alâghe* $\rightsquigarrow \lambda$p.INTEREST(p)

As for *dâshtan*, one could in principle simply follow Francez & Koontz-Garboden in treating it as in (43-b), in which case it introduces the possessive relation between a portion of a quality and an individual while existentially quantifying over the portion argument of the property concept, as in (46).

(46) *dâshtan* $\rightsquigarrow \lambda$P.λx.$\exists$p[P(p) $\wedge$ π(x,p)]

However, there are good reasons not to adopt Francez & Koontz-Garboden's analysis of the possessive verb for Persian: the NVE of a possessive experiencer complex predicate need not always denote a predicate of individuals. In particular, the NVE can be *relativized* (47), *questioned* (48), and *quantified* (49).[4]

(47) bâ hame -ye alâghe -i ke be un dâsht -am
with all -EZ interest -IND that to that have.PST -1.SG
'Despite all the affection I had for him...'

(48) az Hasan cheghadr nefrat dâr -i?
from Hasan how.much hatred have.PRS -2.SG
'How much do you hate Hasan?' (lit. how much hatred do you have of Hasan?)

[4]I thank an anonymous NACIL3 reviewer for pointing this out to me, and for providing (47).

(49) Simin be din hich alâghe -i na- dâr -e
Simin to religion no interest -IND NEG- have.PRS -3.SG
'Simin has no interest in religion.'

On Francez & Koontz-Garboden's analysis, attempting to compose (46) with a moved or quantified NVE would result in a type-clash: *dâshtan* expects a property of portions as an argument, but the trace of movement is a singular term of type e, and quantified NVEs are generalized quantifiers of type <<e,t>,t>, and are thus type-theoretically incompatible with *dâshtan*. We would therefore expect (47)-(49) to be unacceptable, contrary to fact.

Given this problem, I will not adopt Francez & Koontz-Garboden's analysis of quality possession for Persian. Instead, I will pursue a simpler alternative, on which *dâshtan* simply denotes the possessive relation between individuals (50).

(50) *dâshtan* $\rightsquigarrow \lambda y.\lambda x.\pi(x,y)$

To compose the NVE with *dâshtan*, I will follow Chung and Ladusaw (2003) by adopting a composition rule RESTRICT, which composes a function of type <e,t> with a function of type <e<e,t>> by treating the first function as a restrictive modifier of the first argument of the second (51).

(51) $\text{RESTRICT}(f_{<e,t>})(g_{<e,<e,t>>}) = \lambda y.\lambda x.f(y) \wedge g(y)(x)$

Since portions of qualities are a subsort of individual, RESTRICT can compose the NVE *qua* property of qualities with *dâshtan* without further modifications. (52) provides the result of composing a quality noun with the denotation of *dâshtan* in (50).

(52) $\text{RESTRICT}([\![\textit{alâghe}]\!])([\![\textit{dâshtan}]\!]) = \lambda p.\lambda x.\text{INTEREST}(p) \wedge \pi(x,p)$

The use of RESTRICT has the added benefit that it captures the fact that the NVE of possessive experiencer complex predicates, like that of other complex predicates with nominal NVEs, is a pseudo-incorporated bare noun. Importantly, pseudo-incorporation of bare objects is independently possible in Persian (Krifka and Modarresi, 2016; Jasbi, 2020; Modarresi and Krifka, 2021).

(53) Maryam ketâb xarid -∅
Maryam book buy.PST -3.SG
'Maryam bought (a) book(s).'

In (53), the bare object *ketâb* 'book' is interpreted existentially and number-neutrally, properties characteristic of pseudo-incorporated NPs cross-linguistically (Dayal 2011; Srinivas and Rawlins 2021, a.o.). See Krifka and Modarresi (2016) and Modarresi and Krifka

(2021) for further discussion of pseudo-incorporation in Persian.

4.3 Composing the target phrase

Possessive experiencer complex predicates differ from the property concept lexemes that Francez & Koontz-Garboden studied, by virtue of having not just a possessor, but also a PP argument expressing the *target* of the emotional state encoded in the NVE, the individual loved, hated, of interest, etc. These targets are introduced by the prepositions *be* 'to' or *az* 'of/from,' as discussed previously. I analyze these prepositions as functions from individuals to sets of portions, where the individual stands in the TARGET relation to the portion (54).

(54) *be/az* $\rightsquigarrow \lambda x.\lambda p.\textsc{target}(p) = x$

Upon composing with an individual, the target phrase denotes a predicate of portions, and can thus compose with the rest of the VP via RESTRICT, the same rule we invoked to compose the NVE with *dâshtan*. This also allows the target phrase to compose in its surface syntactic position outside the constituent immediately containing the complex predicate.

4.4 Completing the basic analysis: Existential Closure

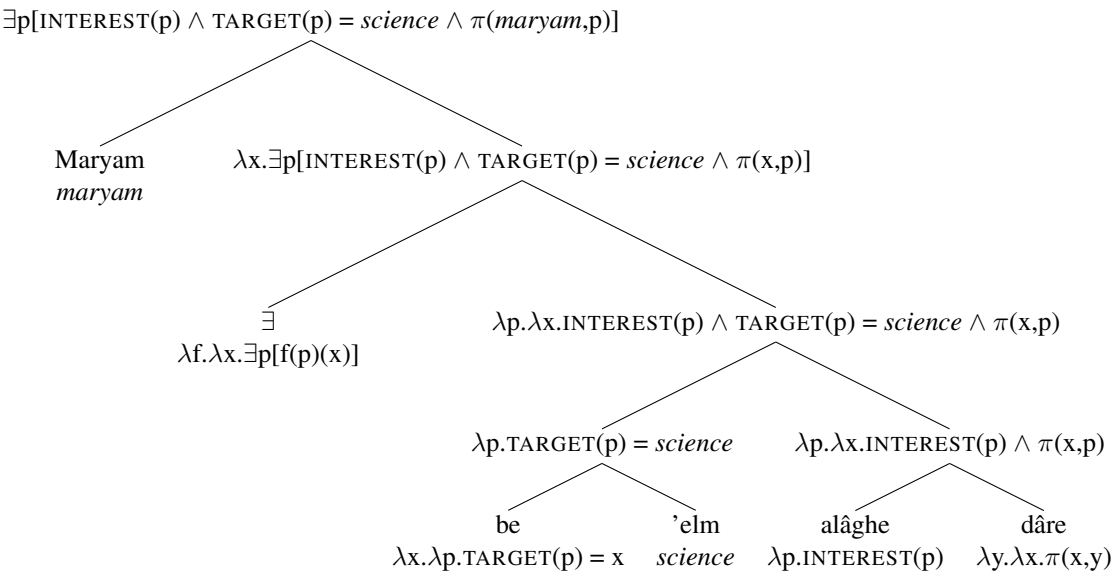
To complete the analysis, a default rule of Existential Closure, defined in (55), applies to saturate the portion argument (Chung and Ladusaw, 2003; Krifka and Modarresi, 2016; Modarresi and Krifka, 2021). This may be omitted when the NVE is quantified or moved.[5]

(55) $\exists \rightsquigarrow \lambda f.\lambda x.\exists y[f(y)(x)]$

Finally, the possessor composes with the VP, completing the analysis. (56) illustrates the full compositional analysis of example (24).

[5]Cases involving movement and quantification are handled straightforwardly, with the quantified NVE taking scope above the base-generated position of the subject at the level of VP. Alternatively, any of a number of *in situ* approaches to quantification in object position can be adopted (Cooper 1983; Barker and Shan 2014, a.o.).

(56)



4.5 Explaining the modification and gradability of the NVE

Treating possessive experiencer complex predicates as possession of a portion of a quality explains their properties straightforwardly. First, if the non-verbal element denotes a predicate of portions of a quality, and such portions are in turn a subsort of individual, we expect them to be modifiable by adjectives. An adjective like *ajib* composes with a predicate of portions straightforwardly via Predicate Modification, as in (57), assuming *ezâfe* is semantically vacuous.

(57) a. *vahshat* $\rightsquigarrow \lambda$p.TERROR(p)
b. *ajib* $\rightsquigarrow \lambda$x.STRANGE(x)
c. *vahshat-e ajib* $\rightsquigarrow \lambda$p.TERROR(p) $\wedge$ STRANGE(p)

The analysis also lends itself to a straightforward account of the gradability of the non-verbal element. I will begin with the analysis of comparatives directly modifying the non-verbal element, but will depart once again from Francez & Koontz-Garboden's analysis. On their approach, comparatives are handled by further modifying the meaning of the possessive head to encode left-bounded intervals of portions (58-a). The comparative, whose denotation is given in (58-b), takes the VP and standard phrase as arguments and asserts that the set of intervals denoted by the standard is a subset of the set of intervals denoted by the VP (58-c) (Francez and Koontz-Garboden, 2017).

(58) a. λP.λx.λI$\subset$P.$\exists z^I[\pi(x,z)]$

b. $\lambda\alpha.\lambda x.\lambda y.\alpha(y) \subset \alpha(x)$, where α is a function of type <e<<p,t>,t>>
c. $\{I \subset \textbf{tallness} \mid \exists z^I[\pi(\text{Clementina},z)]\} \subset \{J \subset \textbf{tallness} \mid \exists z^I[\pi(\text{Abanel},z)]\}$

As Francez & Koontz-Garboden's analysis is designed to handle possessive VP comparisons in Ulwa, it is not well-suited to the analysis of comparatives modifying quality nouns, as in the Persian cases above. This is because the quality noun, being a predicate of portions of a quality, is of the wrong type to compose with (58-b). What's more, adopting their analysis would require a revision, otherwise unmotivated in the context of Persian, to the analysis of *dâshtan*, for which I have proposed to maintain a simple analysis as the ordinary possessive relation.

Instead, I will adopt an analysis of the comparative based on the use of *measure functions*, following Wellwood (2014). On this approach, the comparative introduces an underspecified measure function μ, which directly measures the size of the portion argument of the non-verbal element and compares it to the maximal degree of the measure in the standard clause headed by *tâ*.[6] Upon composing with the degree denoted by the standard clause, *bishtar* may compose with the NVE by Predicate Modification. (60) provides the resulting analysis of (38).

(59) *bishtar* $\rightsquigarrow \lambda d.\lambda x.\mu(x) > d$

(60) $\exists p[\text{INTEREST}(p) \wedge \text{TARGET}(p) = \text{science} \wedge \pi(\text{maryam},p)$
$\wedge\ \mu(p) > \text{MAX}(\lambda d.\exists p'[\text{INTEREST}(p') \wedge \text{TARGET}(p') = \text{religion} \wedge \pi(\text{maryam},p')$
$\wedge\ \mu(p') \geq d])]$

To analyze *ziyâd* 'much,' I posit a similar entry to that for *bishtar*, but have the measure of the quality greatly exceed the contextual standard of the measure function (61). (62) gives the analysis of (35), with *ziyâd* composing with the NVE once again by Predicate Modification.

(61) *ziyâd* $\rightsquigarrow \lambda x.\mu(x) >> \text{STD}(\mu)$

(62) $\exists p[\text{HATE}(p) \wedge \text{TARGET}(p) = \text{hasan} \wedge \pi(\text{roya},p) \wedge \mu(x) >> \text{STD}(\mu)]$

Here, gradability of the NVE is guaranteed without requiring that quality nouns denote the sort of functions required for Francez & Koontz-Garboden's analysis of VP comparatives in Ulwa, nor does it require recourse to another strategy treating quality nouns as denot-

[6] I assume here a standard approach to the structure and interpretation of clausal standards, with operator movement, degree abstraction, and maximization over the resulting set of degrees (Kennedy, 1999; Wellwood, 2014). I further assume that the standard clause, while composing directly with *bishtar*, undergoes a process of Right Dislocation that accounts for its position to the right of the verb in the main clause of a comparative.

ing measure functions or being otherwise endowed with a degree argument (Morzycki, 2009). Rather, reference to degrees is contributed by functional material, with the noun contributing a property of measurable individuals.

5 Additional Predictions

The analysis makes a number of additional predictions beyond the phenomena described at the outset that I will show to be correct. First, since target phrases are treated as predicates of portions on my analysis, we expect that they should be able to compose directly with the NVE via Predicate Modification, and that they should also appear with the NVE in its nominal use outside of complex predicates. This prediction is borne out: the target phrase may appear with independent mental state nominals, with the same preposition that would appear with the complex predicate.

(63) vahshat -e man az shir shadid -e
terror -EZ 1.SG of lion intense -COP.PRS.3.SG
'My terror of lions is intense.'

(64) alâghe -ye man be 'elm ajib -e
interest -EZ 1.SG to science strange -COP.PRS.3.SG
'My interest in science is strange.'

Note that these examples are definite. This is easily accommodated on my analysis, given the type of quality nouns as properties and the independently motivated presence of Partee's 1987 ι type-shifter in Persian (Jasbi, 2020). They can be analyzed as in (65), with IOTA applied to the subject.

(65) $\text{INTENSE}(\iota\text{p}[\text{TERROR}(\text{p}) \wedge \text{TARGET}(\text{p}) = {}^{\cap}\text{LION} \wedge \pi(\textit{speaker},\text{p})])$

Second, since the NVEs of possessive experiencer complex predicates are quality nouns on my approach, we expect them to pattern with quality nouns in other ways. For example, quality nouns in English are known to permit *amount* readings with wh-exclamatives (66). This distinguishes them from concrete nouns, whether count or mass, which lack amount readings with wh-exclamatives (67) (Francez and Koontz-Garboden, 2017).

(66) What courage Kim has! = Kim has so much courage!

(67) a. What dogs Sandy has! $\neq$ Sandy has so many dogs!
b. What water the Aegean has! $\neq$ The Aegean has so much water!

This contrast is replicated in Persian: the NVE of a possessive experiencer complex pred-

icate can be used with a *che* 'what' exclamative, with the same amount reading as other quality nouns (68), while concrete count and mass nouns lack such a reading (69).

(68) a. Bahâr che eshgh -i be shahr =esh dâr -e!
Bahar what love -IND to city =3.SG have.PRS -3.SG
'What love Bahar has for her city!' = Bahar has so much love for her city!
b. Amir che nefrat -i az Hasan dâr -e!
Amir what hatred -IND of Hasan have.PRS -3.SG
'What hatred Amir has for Hasan!' = Amir has so much hatred for Hasan!

(69) a. Simin che sag -i dâr -e!
Simin what dog -IND have.PRS -3.SG
'What dog(s) Simin has!' $\neq$ Simin has so many dogs!
b. Simin che sharâb -i dâr -e!
Simin what wine -IND have.PRS -3.SG
'What wine Simin has!' $\neq$ Simin has so much wine!

Moreover, Persian has an expression *nehâyat* 'extremity, utmost' which can compose with quality nouns (70), but not with concrete nouns (71). This is reminiscent of the interaction of *utter* class modifiers in English (Morzycki, 2012), which Francez and Koontz-Garboden (2017) note distinguish quality nouns from concrete mass nouns.

(70) a. Simin nehâyat -e eshgh -o be sag =esh dâr -e
Simin utmost -EZ love -DOM to dog =3.SG have.PRS -3.SG
'Simin has the utmost love for her dog.'
b. Ali nehâyat -e nefrat -o az Hasan dâr -e
Ali utmost -EZ hatred -DOM of Hasan =3.SG have.PRS -3.SG
'Ali has the utmost hatred for Hasan.'
c. Simin nehâyat -e alâghe -ro be nahv dâr -e
Simin utmost -EZ interest -DOM to syntax have.PRS -3.SG
'Simin has the utmost interest in syntax.'

(71) a. #Simin nehâyat -e sag dâr -e
Simin utmost -EZ dog have.PRS -3.SG
'#Simin has the utmost dog.'
b. #Simin nehâyat -e sharâb dâr -e
Simin utmost -EZ wine have.PRS -3.SG
'#Simin has the utmost wine.'

A final prediction concerns the interaction of *ziyâd* and *bishtar* with the compositional regime established in the basic analysis of possessive experiencer complex predicates in

section 3. Recall that *ziyâd* and *bishtar* are of type <e,t>, and can compose directly with the quality noun by Predicate Modification. However, given their type and the availability of the RESTRICT rule, the analysis predicts that they should be able to compose at the VP-level as well. Therefore, we expect *ziyâd* and *bishtar* to occur as VP modifiers with possessive experiencer complex predicates as well. This prediction is borne out: both *ziyâd* and *bishtar* can adjoin to the VP, with the same interpretation they have when adjoined to the NVE.

(72) Maryam be elm ziyâd alâghe dâr -e
Maryam to science much interest have.PRS -3.SG
'Maryam is very interested in science.'

(73) az Ali bishtar nefrat dâr -am tâ (az) Hasan
from Ali more hatred have.PRS -1.SG until from Hasan
'I hate Ali more than I do Hasan'

This follows directly from my analysis: the portion argument is not closed off by *dâshtan*, so *ziyâd* and *bishtar* can compose with the VP by RESTRICT prior to existential closure of the portion variable. This would *not* be possible on Francez and Koontz-Garboden's original approach, as the possessive verb immediately closes off the portion argument, rendering it inaccessible to modification outside the nominal. This has the added benefit that it is not necessary to resort to Francez & Koontz-Garboden's semantics for comparatives based on intervals of portions to analyze the gradability of VPs in possessive predicating property concept sentences.

6 Beyond Persian: mental state nouns and possessive predication cross-linguistically

While I have focused on Persian in this paper, my analysis receives independent support from two sources outside of Persian. First, mental state nouns pass the relevant diagnostics for quality nouns developed by Francez and Koontz-Garboden (2017), lending support to the analysis of such nouns as predicates of portions of a qualty. Second, possessive-predicating strategies for the expression of mental state is not limited to Persian, and is attested in several other languages in a way that tracks the morphosyntactic strategy used more broadly in the language in question. Finally, several proposals have been made in syntactic theory that decompose stative transitive verbs into possessive structures(Noonan, 1992; Hale and Keyser, 1999, 2002), suggesting that the approach can be applied to languages like English as well. I address each of these issues in turn.

6.1 Mental state nouns are quality nouns

In section 5, I advanced evidence that mental state nominals pattern like quality nouns in Persian. More generally, mental state nominals pass a range of diagnostics proposed by Francez and Koontz-Garboden (2017) to distinguish quality nouns from ordinary count and mass nouns in English and other languages. First, as noted in the previous section, quality nouns, but not concrete nouns, possess amount readings with wh-exclamatives, as demonstrated in (66) and (67) above. Just like Persian, wh-exclamatives with mental state nouns also possess amount readings in English, as (74) demonstrates.

(74) a. What love she has for him! = She has so much love for him
b. What hatred he has for him! = He has so much hatred for him
c. What trust she has in him! = She has so much trust in him
d. What fear they have of ghosts! = They have so much fear of ghosts

Second, using naturally occurring examples from the Web, Francez & Koontz-Garboden point out that quality nouns may be modified by modifiers in the *big* class, such as *big*, *huge*, and *major*, on a reading that measures the extent of a property (75), as well as by modifiers in the *utter* class, such as *utter*, *outright*, and *absolute* (76).

(75) a. It was all about **huge courage** and professionalism. It was all about recognising that without strong defences you have nothing as a country. (http://home.bt.com/news/uk-news/pm-pays-tribute-to-raf-courage-11363992191728)
b. Muffin has **big beauty** in a small package. This darling Jack Russell Terrier is about two years old... (http://www.z107fm.com/pages/tuesdays_pet/)

(76) a. In what should arm him for a war of life against life, he is a creature of **utter cunning, utter courage, utter strength**. He is a troglodyte... (A. H. Lewis, The Boss and How He Came to Rule New York, New York: A. L. Burt, 1903)
b. A perfect blend of local history, ecology and **outright pleasure**. (http://www.tripadvisor.co.uk/ShowUserReviews-g147404-d2233053-r184375715-Virgin_Islands_Ecotours-St_ThomasU_S_Virgin_Islands.html)

Crucially, such modifiers are unacceptable with ordinary mass nouns (77). The idea is that quality nouns, though behaving like mass nouns in many respects, are inherently totally pre-ordered by a size relation, while mass nouns are not, explaining the two classes differential modifiability by *big* and *utter* class modifiers.

(77) a. #major water/gold/soil

b. #utter water/gold/soil

As can be seen in the natural occurring examples below, mental state nouns behave like other quality nouns in being compatible with both *big* class modifiers (78) and *utter* class modifiers (79), providing further support for the quality analysis of such nouns generally.

(78) a. ...people have placed **huge trust** in us and the responsibility that accompanies this can be overwhelming if you don't retain a clear, undimming vision. (https://www.stonebridgenursinghome.co.uk/about/)
b. I used to have **huge hatred** for RZ's Halloween, simply because I couldnt see the point of remaking such a classic... (https://horrorcultfilms.co.uk/2013/02/to-hell-and-back-in-defence-of-remakes/)
c. I am not kidding, I have **major love** for all the rural fences here in Virginia. (https://blog.megannielsen.com/2011/02/good-fences/)
d. Chelsea of course have **major interest** in Bellingham, and he would be considered a number one target in terms of the midfield position for the club. (https://thetransferroom.com/chelsea/report-liverpool-confident-of-signing-chelsea-target-jude-bellingham)

(79) a. ...only someone with an **utter hatred** for movies could fail to respect and appreciate the titanic talent behind the camera. (https://theboar.org/2022/02/west-side-story-sees-spielberg-flexing-his-muscles/)
b. I believe it was because she projected **an utter trust** in God. (https://www.americamagazine.org/issue/577/letters/letters)
c. 'We have an **utter love** for wood artworks because it's such a lively material with beautiful natural patterns. (https://www.theodeto.com/blogs/artists/ben-graham)
d. Across the studies, consumers who expressed **an outright interest** in the upgrade were more likely to trash their older model.
e. I have an **utter fear** of snakes. I can't read books about them, I can't watch them on tv, and the thought of being in a room with one has me shaking and in tears. (https://missclevelandsreading.com/2018/01/09/feel-the-fear/)

Furthermore, although not included in Francez & Koontz-Garboden's set of diagnostics, mental state nouns and quality nouns pattern together in permitting modification by *utmost*, while ordinary nouns cannot be modified by *utmost*. This parallels the pattern of acceptability observed with Persian *nehâyat*, which is also only compatible with quality nouns.

(80) a. I can only say that I have **the utmost trust** and faith in this good man as a doctor.
(https://www.indexjournal.com/opinion/letters/still-has-trust-in-dr-robirds/article_857b965b-7426-5c34-bffc-89603d974c06.html)
b. I feel **the utmost hatred** towards this pathetic boys-club system.
(https://www.feminist.com/askamy/violence/v10.html)
c. The Crisis was of **the utmost interest** in Great Britain, where public opinion was deeply divided regarding whether to recognize the Confederacy.
(https://bostonraremaps.com/inventory/james-wyld-secession-united-states-1861/)
d. The Rootery has **the utmost love** for their plants and products and want to make sure they are just as loved in your home.
(https://www.therooteryofficial.com/shipping-returns)

(81) a. It takes **the utmost courage** to share the first draft of a work with a group...
https://www.community-relations.org.uk/news-centre/fighting-words-first-ever-ni-summer-camp-showcase-young-people
b. For De Beers Jewellers we go even further, scrutinising and selecting by eye for fire, life and brilliance those truly exquisite diamonds with **the utmost beauty**...
(https://www.debeers.co.uk/en-gb/about-us.html)

(82) a. #I have the utmost wine at my home
b. #I have the utmost dogs in the country

Finally, quality nouns are known to be compatible with certain quantifiers in Italian, particularly *nessun(o)* 'no,' which are not compatible with ordinary mass or plural count nouns (Tovena, 2001; Francez and Koontz-Garboden, 2017; Zamparelli, 2020).

(83) Non ho nessun corragio/talento/*libri/#vino
NEG have.PRS.1.SG no courage/talent/books/wine
'I have no courage/talent/*books/#wine.'

Nessun is also compatible with mental state nouns, as (84) demonstrates with naturally occurring examples from the Web.

(84) a. Io non ho **nessun odio** per Berlusconi
1.SG.NOM NEG have.PRS.1.SG no.MASC.SG hatred por Berlusconi
'I have no hatred for Berlusconi.'
(https://www.corriere.it/Speciali/Politica/ParolePolitica/2006/02_Febbraio/22/index4.shtml)

b. Il fatto è che non ho **nessun**
theMASC.SG fact COP.PRS.3.SG that NEG have.PRS.1.SG no.MASC.SG
amore per Kusturica
love for Kusturica
'The fact is that I have no love for Kusturica.'
(https://www.goodreads.com/review/show/1956004770)

c. Non ho **nessun** **interesse** per la cucina
NEG have.PRS.1.SG no.MASC.SG interest for theFEM.SG cooking
'I have no interest in cooking.'
(https://www.imusicfun.it/news/interviste/intervista-serrati/)

d. Non ho nessuna fiducia in questo governo
NEG have.PRS.1.SG no.FEM.SG faith in this.MASC.SG government
'I have no faith in this government.'
(https://www.filcams.cgil.it/article/rassegna_stampa/
aiuti_ai_piu_deboli_casa_trasporti_c_e_il_via_libera)

Altogether, these diagnostics strongly suggest that a quality semantics for mental state nouns is on the right track, not only because of its ability to account for the properties of Persian possessive experiencer complex predicates, but also because such nouns pattern with other quality nouns with respect to the diagnostics above.

6.2 Possessive-predicating strategies for mental state expressions outside Persian

Persian is not alone in constructing mental state predicates by means of a possessive predicating strategy. For one, one can see from the examples in section 6.1 above that both English and Italian are able to make use of a possessive predicating strategy for the expression of mental states, even if this is not the most common strategy utilized by these languages. This said, there are a number of languages that use possessive predication as a primary strategy to express mental states. Moreover, we see the same kind of variation in possessive predication as Francez and Koontz-Garboden (2017) observed for other kinds of property concept sentences. For example, in Sorani Kurdish, a Northwestern Iranian language, mental state predicates exist that are expressed using an existential construction with a prepositional target phrase (85), where the possessor is expressed as a possessive clitic on the possessed NP, amounting to what Francez and Koontz-Garboden (2017) call a *existential possessive NP strategy* (85). In addition to the clitic, the possessor may be expressed as a topic phrase at the beginning of the sentence. Importantly, this existential construction is the same one used for possession in the language more generally (86).

(85) a. Roja la Hasan rq -ek -i zor =i hæ =j -æ
Roja at Hasan hatred -IND -EZ MUCH =3.SG exist =3.SG -COP.3.SG.PRS
'Roya hates Hasan a lot.' (lit. Roya, a lot of hatred of hers exists at Hasan)

b. bo Simin rez =ım hæ =j -æ
with Simin respect =1.SG exist =3.SG -COP.3.SG.PRS
'I respect Simin.' (lit. my respect exists with Simin)

c. bæ isa bawır =man hæ =j -æ
to Jesus believe =1.PL exist =3.SG -COP.3.SG.PRS
'We believe in Jesus.' (lit. our belief exists toward Jesus)

(86) kteb -ek =ım hæ =j -æ
book -IND =1.SG exist =3.SG -COP.3.SG.PRS
'I have a book.' (lit. a book of mine exists)

Even outside of the Iranian language family, one can find languages that mental state predicates by means of a possessive strategy. For instance, the Celtic languages Irish and Scottish Gaelic make use of an existential construction to express both possession and mental state predicates, using what Francez and Koontz-Garboden (2017) call a *property pivot strategy*, in which the quality noun is the existential subject, and both the possessor of the quality and its target are introduced by prepositional phrases. A closer look at Irish reveals that such a possessive predicating strategy exists for many of the same predicates that Persian constructs with *dâshtan*. The following examples are drawn from Noonan (1992) and from *Foras na Gaeilge*'s Irish dictionary.[7]

(87) tá leabhar agam
be.PRS book at.1.SG
'I have a book.' (lit. there is a book at me.)

(88) tá madra acu
be.PRS dog at.3.PL
'They have a dog.' (lit. there is a dog at them.)

(89) tá grá agam duit
be.PRS love at.1.SG to.2.SG
'I love you.' (lit. there is love at me to you.)

(90) tá fuath agam dó
be.PRS hatred at.1.SG to.3.SG.MASC
'I hate him.' (lit. there is hatred at me on him.)

(91) tá muinín agam asat
be.PRS trust at.1.SG from.2.SG
'I trust you.' (lit. there is trust at me from you.)

(92) tá eagla roimh an bpúca ag Ailill
be.PRS fear before the puca at Ailill
'Ailill fears the Puca.' (lit. there is fear before the puca at Ailill.)

[7]The dictionary is available online at www.focloir.ie, and provides example sentences to illustrate usage.

(93) níl aon suim acu i gcúrsaí polaitíochta
NEG.be.PRS any interest at.3.PL in affair.PL politics.GEN
'They have no interest in politics.' (lit. there is no interest at them in politics.)

The same analysis I have proposed for Persian can be extended to Sorani and Irish, differing only in how the components of the meaning are distributed throughout the structure.[8] For example, the existential possessive NP strategy of Sorani can be analyzed by having the possessive clitic introduce possessive semantics, with the prepositional phrase introducing the target (94). The clitic composes directly with the quality noun by Predicate Modification, while the target preposition composes with an individual, producing a phrase of type <p,t>, which can in turn compose with the quality NP by Predicate Modification.

(94) a. $[\![rq]\!] = \lambda$p.HATRED(p)
b. $[\![{=}ım]\!] = \lambda$p.π(*speaker*,p)
c. $[\![la/bo]\!] = \lambda$x.λp.TARGET(p) = x

The analysis of Irish is essentially analogous to that of Sorani immediately above. The difference would lie in that the possessor is introduced by the preposition *ag*, with a semantics as in (95).

(95) $[\![ag]\!] = \lambda$x.λp.π(x,p)

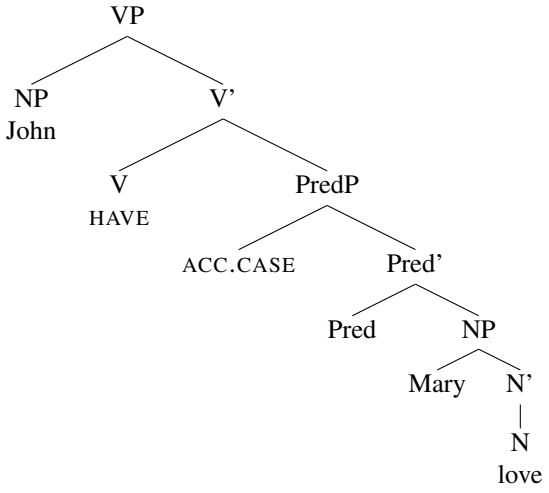
This analysis predicts quality nouns to be modifiable and gradable like their Persian equivalents, and to otherwise behave like quality nouns in the language. The fact that they can be so modified can already be seen in examples above: for example, in the Sorani sentence in (85-a), *rqek* 'hatred (indef.)' is modified by *zor* 'much' using the *ezâfe* construction, in the same way that Persian NVEs can be modified by *ziyâd*. Likewise, in the Irish sentence in (93), *suim* 'interest' appears with a quantifier *aon* 'any,' suggesting these may permit quantification in a manner similar to Persian NVEs. I leave further exploration of the properties of these constructions to future research.

[8] An alternative to this transparent analysis of the Irish sentences is to simply treat Irish as underlyingly structurally similar to Persian, but with syntactic conditions ruling out the pronunciation of the verb as *have*. This is essentially the approach taken in Noonan (1992) and Harves and Kayne (2012): for these authors, Irish lacks *have* as a lexical item capable of spelling out a possessive structure, and the prepositional phrases are present for Case-theoretic reasons. On this approach, there would be no underlying syntactic difference between Persian and Irish, and the analysis of Irish would be essentially the same as the analysis of Persian.

6.3 Decomposing transitive stative verbs

A number of syntactic approaches to verbal argument structure have proposed that stative transitive verbs of the sort found in English be decomposed into an underlying mental state noun and a possessive element, either a preposition or a verb (Noonan, 1992; Hale and Keyser, 1999, 2002; Harves and Kayne, 2012). For example, Noonan (1992) decomposes both English *love* and its Irish possessive equivalent into a possessive structure containing a stative NP and a possessive verb HAVE (96).

(96) Decomposition of *love* from Noonan (1992: 201, ex.21)

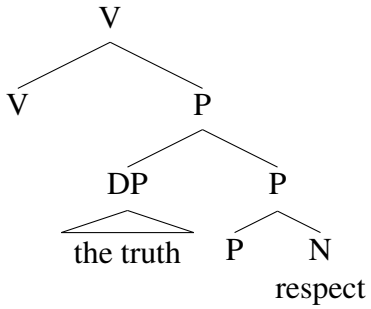


In a similar vein, Hale and Keyser (2002) point out that English has several possessive paraphrases for stative transitives, alternating with a *have* and *give* form where the root of the verb is realized as a nominal.

(97) a. Mary has John's love/respect.
b. John gives Mary his love/respect.

For this, and other reasons, such as the inability of stative transitives to form middles, Hale & Keyser propose to decompose them into a combination of a verb and a prepositional phrase, with the target phrase in the specifier of the prepositional phrase and the mental state expressed as a noun acting as the complement of P.

(98) Hale & Keyser's (2002: 41, ex. 26) decompositional analysis of stative transitive verbs



Given this existing tendency in the syntactic literature to decompose stative transitive verbs into possessive predicating structures, it is perhaps no surprise that there should be

languages that express mental states primarily via possessive predication: languages like Persian simply express on the surface an underlying structure common to all languages. What's more, this means that the analysis I have proposed for Persian is applicable to languages like English. As an example, the syntax in (98) could be endowed with a quality semantics similarly to what I proposed for Persian, but with the P head composing with the quality noun via a distinct composition rule of QUALITY IDENTIFICATION (QI), modeled after EVENT IDENTIFICATION from Kratzer (1996) (99). On this approach, the P head would introduce the target in much the same way that Voice introduces the agent role on Kratzer's approach. A similar analysis would hold for the possessive V head.

(99) a. $QI(f_{<e,<p,t>>},g_{<p,t>}) = \lambda x.\lambda p.f(x)(p) \wedge g(p)$
b. $[\![P]\!] = \lambda x.\lambda p.\textsc{target}(p) = x$
c. $[\![P\ \textit{respect}]\!] = QI([\![P]\!],[\![\textit{respect}]\!]) = \lambda x.\lambda p.\textsc{target}(p) = x \wedge \textsc{respect}(p)$

Even outside of decompositional approaches to the argument structure of stative verbs, there is reason to think that stative transitive verbs share a common , quality-based core with possessive predicating property concept sentences. For instance, Baglini (2015) and Francez and Koontz-Garboden (2017) point out that, in Wolof, possessive predicating property concept lexemes pattern with stative transitive verbs in e.g. their compatibility with the degree modifier *lool* and the comparative *gën*. Non-stative predicates and possessive VPs with mass nouns are unacceptable with both, suggesting that quality possession is at issue.

(100) a. Awa am -na -∅ xel lool
Awa have -FIN -3.SG mind very
'Awa is very smart.' (Bagline 2015: 17)
b. Fanta bëgg -na -∅ ceeb lool
Fanta like -FIN -3.SG rice very
'Fanta likes rice a lot.' (Baglini 2015: 155)
c. Awa am -na -∅ ceeb (*lool)
Awa have -FIN -3.SG rice very
Intended: 'Awa has a lot of rice.' (Bagline 2015: 17)

In this way, the semantics of quality possession can be extended straightforwardly to languages that express mental state via transitive verbs, in much the same way that such a semantics can be extended to lexical adjectives for property concept sentences more generally (Menon and Pancheva, 2014).

7 Taking stock and areas for future research

I have examined the properties of possessive experiencer complex predicates in Persian, demonstrating the modifiability and gradability of their NVEs. I proposed that they be analyzed as instances of possessive predicating property concept sentences, extending Francez & Koontz-Garboden's semantics for quality possession to mental state constructions, while enriching the general approach with RESTRICT and existential closure (Chung and Ladusaw, 2003) and a measure function approach to comparatives and *ziyâd* (Wellwood, 2014). I showed that the approach captures key properties of these constructions, such as their connection to the grammar and semantics of pseudo-incorporation, and makes further correct predictions about their behavior. I then showed that the proposal can be extended to explain the properties of expressions encoding mental state outside of Persian by demonstrating that mental state nouns behave pass Francez and Koontz-Garboden's diagnostics for quality nouns, showing that the possessive predicating strategies for mental states in languages like Sorani Kurdish and Irish can be endowed with a similar analysis to Persian, and extending the approach to a decompositional analysis of mental state verbs in the style of Hale and Keyser (2002).

In addition to explaining the properties of possessive experiencer complex predicates in Persian, this work forges a more general connection between the grammar of mental state predicates and that of property concept sentences cross-linguistically. In particular, this work provides direct support for Baglini (2015) and Francez and Koontz-Garboden's 2017 approach that posits a shared ontology between possessive predicating property concept sentences and transitive stative verbs, by virtue of the fact that the latter are instantiated by possessive predication in some languages. It further develops a semantics that aligns well with extant analyses in the syntactic literature that take stative transitives to be decomposed into a nominal head expressing a mental state and a prepositional or verbal head expressing possessive or target semantics.

This work leads to a number of directions for future research. For one, in Francez and Koontz-Garboden's (2017) approach, qualities and the nouns that characterize them see very little compositional action, as they are existentially quantified off by the possessive very early in the derivation of property concept sentences. However, given the modifiability of quality nouns in Persian, it would be illuminating to revisit Francez & Koontz-Garboden's original domain of inquiry, and examine the modifiability and gradability of the quality nouns themselves in languages with a possessive predicating strategy for property concept sentences more generally. For example, do languages like Wolof and Hausa permit modification or quantification of the possessed quality noun, such that a modification of the compositional regime needed to compose property concept sentences is motivated outside of Persian? Or do languages differ in the extent to which they permit

modification of the property concept lexeme in such structures?

Second, the semantic ontology and compositional regime employed here may be profitably extended to the analysis of other complex predicates in Persian, particularly those exhibiting light verb alternations and modifiable/gradable NVEs. For example, with many complex predicates constructed out of instrument nouns, such as *otu kardan* 'to iron,' *arre kardan* 'to saw,' and *shune kardan* 'to comb,' among others, the light verb *kardan* alternates with *shodan* 'to become' as well as *dâshtan*.

(101) a. man in pirhan -o otu kard -am
1.SG this shirt -DOM iron do.PST -1.SG
'I ironed this shirt.'

b. in pirhan otu shod -∅
this shirt iron become.PST -3.SG
'This shirt got ironed.'

c. in pirhan otu dâr -e
this shirt iron have.PRS -3.SG
'This shirt has been ironed.' (lit. this shirt has iron)

Interestingly, the NVE *otu* 'iron,' despite appearing to characterize the instrument by which an event was accomplished, seems to behave in many ways like a property concept lexeme or stative predicate: it can be coordinated with other stative predicates (102), and can also be modified by degree modifiers, in which case the modifier makes reference to the degree to which something was ironed (103).

(102) Ali lebâs -â -ro otu va tamiz kard -∅
Ali clothes -PL -DOM clean and iron do.PST -3.SG
'Ali cleaned and ironed the clothes.' (lit. Ali made the clothes clean and ironed)

(103) a. Ali pirhan -o otu -ye ziyâd -i kard -∅
Ali shirt -DOM iron -EZ much -IND do.PST -3.SG
'Ali made the shirt much ironed.' (lit. Ali made the shirt much iron)
CONTEXT: Ali ironed the shirt once. At the end of the ironing, the shirt was wrinkle-free and very smooth.

b. Ali az pirhan shalvâr -o otu -ye bishtar -i kard -∅
Ali from shirt pants -DOM iron -EZ more -IND make.PST -3.SG
'Ali ironed the pants more than the shirt.'
CONTEXT: Ali ironed both the pants and the shirt. However, the pants have no wrinkles and are pressed very neatly, while the shirt still has some wrinkles and is not quite as well ironed as the pants are.

c. in lebâs otu -ye bishtar -i az un shalvâr dâr -e
this clothes iron -EZ more -IND from that pants have.PRS -3.SG
'These clothes are more ironed than these pants.'

One possibility is that the apparent instrument nouns instead denote predicates of states or, as in the analysis here, portions of quality, such as *ironedness*, *sawnness*, and *paintedness*. Combined with a relational analysis of the verbs in question (*kardan, shodan, dâshtan*), the same composition setup of RESTRICT and Existential Closure could be extended to their analysis.

Third, Persian also makes use of possessive predication to express a number of *propositional attitude* predicates, particularly concerning belief, desire, and need. (104) gives several examples of such complex predicates.

(104) Persian attitudinal complex predicates with *dâshtan*

a. *bâvar/e'teqâd dâshtan* 'to believe' (lit. have belief)
b. *niyâz/ehtiâj dâshtan* 'to need' (lit. have need)
c. *etminân dâshtan* 'to be certain' (lit. have certainty)
d. *ârezu dâshtan* 'to wish' (lit. have wish)
e. *shakk dâshtan* 'to doubt' (lit. have doubt)
f. *entezâr dâshtan* 'to expect' (lit. have expectation)

Like other possessive experiencer complex predicates, the NVE of these complex predicates is modifiable and gradable. A promising approach might treat the NVEs of these complex predicates as *content nouns*, building on analyses of clausal embedding (Kratzer 2006; Moulton 2009; Elliott 2017) to embed an attitude semantics within the quality semantics, with possessive predication introducing the attitude holder. I leave an in-depth study of this class of complex predicates to future research.

Lastly, there has been recent work on mental state and attitude verbs from the perspective of Neo-Davidsonian event semantics, particularly Pasternak (2019), focusing on their gradability and corresponding measures of intensity. For example, Pasternak's system explains the gradability of desire reports via an interaction between the *altitudes* of mental states *qua* predicates of eventualities and a measure function that is monotonic with respect to the part structure of those eventualities and their corresponding altitudes. The work reported here has different explanatory goals from Pasternak's: while Pasternak aims to explain the gradability of mental state verbs and a corresponding connection to the preference ordering at the heart of desire reports, my own concern has been with the expression of mental states via possessive predication and their semantic composition, with an analysis of modification and gradability as an additional boon of the analysis. While I have set aside the issue of gradability of attitude reports in this paper, ultimately the grad-

ability of such reports in Persian should be addressed. Once this has been investigated in more detail, a comparison between Pasternak's approach and my own may prove fruitful.

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