

Causative Constructions in Persian: A Critical Review of the Voice-Bundling Approach

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The structure of causatives has been the subject of debate since Pylkkänen's (2008) proposal of a voice-bundling parameter, in which languages either employ a fused functional head which unifies the functions of Voice and little *v* (i.e., categorial and voice features) in a single projection, or separate little *v* and Voice heads that carry these features (Key 2013, Harley 2017, Nabors 2019). This paper provides a comprehensive overview of the typology of causative constructions in Persian. A challenging problem is data from Persian which demonstrate that the language allows both Voice-bundling and non-Voice-bundling constructions. Harley (2017) proposes that Persian light-verb causatives can be considered as Voice-bundling where verbalization and agent-introduction are all realized in a single *v* head. This proposal works perfectly for the light verb constructions in Persian, but other causative constructions in the language have different properties and a single head cannot be responsible for both Voice and little *v* functions (Karimi 1997, Folli et al. 2005, Nabors 2019). Nabors (2019) argues that Persian morphological causatives are formed with a root attaching causative morpheme, -an, and this morpheme cannot bundle under the same head with little *v*. The conclusion that can be drawn is that both Voice-bundling and non-Voice-bundling constructions can be present in the same language, as in Persian.*

1. Introduction

A large number of existing studies in the broader literature have addressed the causative constructions cross-linguistically. The main purpose of this study is to provide a review of literature about the typology of causative construction in Persian (i.e., lexical, morphological, light-verb alternation and syntactic/periphrastic) followed by the examination of two types of the Persian causative constructions in light of the Voice-bundling approach (Pylkkänen 2008). To account for the syntactic behavior and variations of causativization across languages, Pylkkänen (2002, 2008) introduces the Voice-bundling parameter, by which the functions of Voice and little *v* can be unified in a single projection in Voice-bundling languages and can perform their functions independently in non-Voice-bundling languages (Harley 2017).

The theory of Universal Grammar (Chomsky 1981) consists of a set of universal principles that are proposed as common to all human languages, and parameters that define the ways in which languages may vary. Specific parameters (e.g., head-initial vs. head-final position) are either turned on or off for particular languages. According to

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Pylkkänen's (2008) proposed Voice-bundling parameter, languages are either Voice-bundled or non-Voice-bundled. This paper considers whether bundling of Voice and little *v* is parametrized in Persian or not.

I organize the rest of the paper as follows: I review the theories of causative constructions in §2. I introduce Pylkkänen's (2008) Voice-bundling theory and the criteria for diagnosing the bundling nature of languages in §3. Then, I summarize the causative constructions in Persian, review two theories about the bundling nature of morphological and light-verb alternation causatives and propose tree structures in §4. Finally, I will recap the main points covered in the paper in §5.

2. Causative Constructions

In this section, I review the theories of causative constructions followed by the main types of causative constructions cross-linguistically.

2.1. Adding Arguments

The contributions to the theory of argument structure range from the pre-Minimalism θ -theory (Baker 1988) to lexicalist (Chomsky 1970) and constructivist (Hale and Keyser 1993; 2002) arguments. In the Government and Binding Framework (Chomsky 1981), a predicate is considered to have several types of information introduced in its lexical entry. The information included in the predicate ranges from denotative meaning with phonological representation to the information about the syntactic category and syntactic behavior of the predicate as well as information about the number and types of argument required by the predicate (the predicate's θ -grid) (Harley 2010).

According to Marantz (2013), the origin of the lexicalist tradition is back to Chomsky's 'Remarks on Nominalization' (Chomsky 1970), and it emphasizes the role of verbs in projecting syntactic structure from argument structure information stored with the verbs. The constructivist approach, often linked to the works of Hale and Keyser (1993, 2002), emphasizes the role of syntax in constructing the meaning traditionally attributed to argument structure.

In the lexicalist perspective, the causative morpheme adds semantics and specifies the adding of an argument and the role of that argument. In the constructivist view, the causative morpheme is meaningless by itself but serves as a marker of a different argument structure; in this view the differences in interpretation comes from argument and argument structure rather than morpheme itself. Accordingly, to form a causative construction, a verbal morpheme adds an external argument to the sentence. This external argument is an expression which helps to complete the meaning of the verb. Following the discussion of adding an argument, I review the causative constructions in §2.3.

2.2. Causative Alternation

The main focus of this part is the discussion of causative alternation between lexical causative verbs and their anti-causative (inchoative) counterparts. Jespersen (1927) presented the first comprehensive analysis of change of state (COS) verbs and their behavior in causative-inchoative alternation. (Jasbi 2011). Based on his discussion of English verbs, it is impossible to classify verbs into transitive and intransitive categories since many verbs participate in both structures. Jespersen (1927) analyzes these "often-alternating verbs" in five major categories of "move and change", "de-adjectival",

“substantives”, “causative-inchoative” and “active-passives” (Jasbi 2011: 2). More specifically, he defines the “move and change” class as “semantically related verbs, each with two meanings: (1) to produce a movement or change in something and (2) to perform the same movement or undergo the same change” (Jespersen 1927, cited in Jasbi 2011: 2).

Rappaport Hovav and Levin (2012), Schäfer (2009), Piñón (2001) and Levin (1993) provide arguments for the causative alternation. Schäfer (2009) defines causative alternation as the verbs that have both transitive as well as intransitive use. The intransitive form typically “denotes a change-of-state event undergone by some entity” (Schäfer 2009: 1), and the transitive counterpart “denotes that this change-of-state event has been brought about or caused by some different entity” (Schäfer 2009: 1).

A central characteristic of this transitivity alternation is that the subject in the intransitive form bears the same semantic relation to the verb as the object in the transitive. The verbs undergoing the causative alternation are often called anti-causative or inchoative verbs in their intransitive form (Piñón 2001).

Accordingly, Piñón (2001) suggests other labels for the causative alternation as causative-inchoative alternation or anti-causative alternation and defines the alternation as:

a lexical alternation that characterizes pairs of verbs which stand in approximately the following semantic relation to each other: the intransitive member of the pair, a.k.a. an inchoative verb, denotes a change of state, and the transitive member of the pair, a.k.a. a causative-inchoative verb, denotes a bringing about of this change of state. (p.346)

To clarify the idea, consider the sentences (1)-(3):

- (1)
- a. The window broke.
 - b. The boy broke the window. (Schäfer 2009: 641)
- (2)
- a. The door opened.
 - b. Maria opened the door. (Piñón 2001: 346)
- (3)
- a. The clothes dried.
 - b. Thomas dried the clothes. (Piñón 2001: 346)

Sentences (1a), (2a) and (3a) are intransitive sentences containing inchoative verbs that denote a simple change-of-state event of the subject ‘the window’, ‘the door’ and ‘the clothes’, whereas the transitive sentences (1b) to (3b) contain the causative-inchoative counterparts, which express the concept in which someone caused someone or something to do or undergo a circumstance.

Furthermore, there are two central concerns in the causative/inchoative alternation: The first is why not every inchoative verb has a causative-inchoative counterpart, and the second is why not every causative-inchoative verb has an inchoative counterpart (Piñón 2001; Rappaport Hovav and Levin 2012). To clarify the idea, in the examples (4a), (5a)

and (6a), the inchoative verbs, *bloom*, *rust away*, and *disappear*, indicate the change-of-state event, while the transitivized sentences (4b), (5b), and (6b) are ungrammatical. However, these types of inchoative verbs can appear unproblematically in periphrastic causative constructions (e.g., *Rebecca caused the roses to bloom* or *Rebecca made the roses bloom*) (Piñón 2001).

- (4)
- a. The roses bloomed.
 - b. *Rebecca bloomed the roses. (Piñón 2001: 346)
- (5)
- a. The iron gate rusted away.
 - b. *Maria rusted away the iron gate. (Piñón 2001: 346)
- (6)
- a. The rabbit disappeared.
 - b. *The magician disappeared the rabbit.¹

On the other hand, the second concern is the causative-inchoative verbs which lack an inchoative counterpart, consider the following contrasts in examples (7) and (8):

- (7)
- a. Rebecca broke her promise.
 - b. *Her promise broke. (Piñón 2001: 347)
- (8)
- a. Maria cracked the secret code.
 - b. *The secret code cracked. (Piñón 2001: 347)

The inchoative verbs **broke* and **cracked* are ungrammatical (Piñón 2001).

2.3. Main Types of Causative Constructions

Formal types of causatives can be distinguished according to “how the meaning ‘CAUSE’ is expressed” (Kulikov 2001). Based on the reviewed literature (e.g., Baron 1974; Song 1996; Kulikov 2001; Shibatani and Pardeshi 2002), the main² cross-linguistic categories of causatives can be expressed as below:

Morphological causatives. In morphological causatives, the causative morpheme is an affix which applies to the base (non-causative) verb (Dixon 2000). In Persian, simple verbs are causativized with the morpheme, *-an*, pronounced [an] (Nabors 2019). In example (9), (9a) is an unergative verb, while (9b) is the causativized, transitive counterpart.

¹ (6) is my example; In this paper, I occasionally provide my own examples that are checked with my native-speaker colleagues.

² I review the most cross-linguistically frequent types in this section. Categories like Persian *light-verb alternation* are not included.

(9)

- a. *khane sukh-t-∅.*
house burn-PAST³-3SG⁴
'The house burnt.'
- b. *Ali khane-ra suz-an-d-∅.*
Ali house-ACC burn-CAUS-PAST-3SG
'Ali burnt the house.'

(Nabors 2019: 83)

In this example, the causative morpheme, *-an*, is attached to the root *suz* 'burn' to form the morphological causative in Persian.

Lexical causatives. Lexical causatives are verbs meaning 'CAUSE' but these verbs lack a regular and productive causative marker (Kulikov 2001). Based on the reviewed literature, there are two main types of lexical causatives. In the first type, the form of lexical causative considers non-suppletive forms for the lexical causatives (e.g., *break* (intransitive) vs. *break* (transitive) in English). In this perspective, lexical causatives look the same as a regular transitive verb at the first sight. However, the transitive verbs generally do not have an intransitive counterpart, unlike lexical causatives. This difference is also clear in the semantics of the verbs (Velázquez-Castillo 2002). Accordingly, the regular transitive verbs make reference to a single-event situation in which one participant puts direct force on a second participant. For instance, in sentence (10), *kick* implies the direct force that *John* applies to *kick the ball*. The transitive verb covers the single-event situation of 'kicking' and the effected event of 'happening' (Velázquez-Castillo 2002).

(10) John kicked the ice, but nothing happened to it. (Velázquez-Castillo 2002: 512)

On the other hand, the second form of lexical causative that exists in the languages like Persian is a suppletive lexical causative (e.g., *kill* vs. *die* in English). In this sense, lexical causatives are in a suppletive relation with their non-causative counterparts (e.g., *kill/die*). In the example provided below, the non-causative stem *die* in (11a) is replaced with its causative counterpart stem *kill* resulting in an allomorph of a morpheme which has no phonological similarity to the other allomorphs.

³ I provide different examples from different sources with different types of glossing. For the purpose of consistency, I unify all the glossing through the paper using the Leipzig glossing rules.

⁴ The following abbreviations are used in the data presented in this paper:

ACC	= accusative case	SBJ	= subject
CAUS	= causative	SG	= singular (person)
INF	= infinitive	VERBLZ	= verbalizer
PAST	= past tense		

- (11)
- a. The Elephant man died.
 - b. The sheriff killed the Elephant man.

Accordingly, I consider the suppletive lexical causative definition in this paper and illustrate the lexical causatives in Persian in §4.1.

Syntactic (periphrastic) causatives. In syntactic causatives (other terms: *periphrastic*, or *analytic causatives*), a causative morpheme is a free form, typically a verb meaning *cause*, *make*, *let*, *give*, *have*, etc. In English, verbs like *make*, *go*, *let*, and *know* fit in syntactic causative structures (Kulikov 2001). Causation in periphrastic structures mainly can be expressed through two verbs and two clauses (in the main clause with the lexical verb and in a subordinate clause). Sentences (12) and (13) show two examples of Persian and English causatives, respectively:

(12) *man baes sho-d-am ke Sara be-khab-ad.*
 1SG cause make-PAST.1SG REL Sara INF-sleep-3SG
 ‘I caused Sara to sleep.’

(13) *I force-d Josh to sleep.*
 1SG force.CAUSE-PAST Josh INF-sleep
 ‘I forced Josh to sleep.’

Moreover, there is a semantic difference between morphological and lexical causatives and syntactic/periphrastic causatives: “in the syntactic/periphrastic causatives, the causer is not involved directly in the process of causation. However, the causer is involved directly in the process in the morphological and lexical causatives” (Nabors 2019: 73). For example, in Persian, *Sara arousak ra pare kard* ‘Sara tore the doll’, the causer, *Sara*, is directly involved in the process of tearing the doll; on the other hand, in *man baes shodam ke Sara bekhabad* ‘I caused Sara to sleep’, the causer *man* does not have a direct role in the process of making Sara sleep⁵. Therefore, “in the syntactic/periphrastic causatives, the causer puts some force on the causee to do something, while there is no such force in morphological causatives” (Nabors 2019: 74).

Considering the arguments provided regarding the notion of causative constructions, I will discuss the concept of Voice-bundling in §3, followed by the causative typology and constructions in Persian.

3. Voice-Bundling Hypothesis

In this section, I first provide some background on the concept of split-VP by considering several arguments in §3.1. Then, §3.2 provides arguments on Voice-bundling/splitting languages approach focusing mainly on Pylkkänen (2008) followed by the typology of causative structures proposed by Pylkkänen (2008).

⁵ I either caused Sara to sleep by herself or I do something for her to sleep.

3.1. Background: The Split VP

Reviewing the traditional notion of the clause, there are three layers: C(omplementizer) P(hrase), I(nflection) P(hrase) and the V(erb) P(hrase). “The CP provides a connection to a matrix sentence or contains an indication of ‘speaker’s attitude’; the IP includes grammatical information such as tense and agreement; and the VP accommodates the arguments” (Gelderen 2004: 1). Marantz (1984) is the first to present the idea supporting the assumption that external arguments are not true arguments of their verbs. Based on the argument, each of the layers has been claimed to be split and have a split projection.

Since early 1990s, scholars have considered the basic verb phrase with two distinct projections of a functional layer v/VoiceP and a lexical layer root/VP (Harley 2017). Hale and Keyser (1993), Kratzer (1994, 1996), Chomsky (1995), and Marantz (1997) provide a different subset of properties to the new external argument-introducing projection. This new functional projection has a variety of names in the literature, such as vP (Chomsky 1995) or VoiceP (Kratzer 1996).

Recent developments in generative grammar, however, have subdivided the VP further and suggested that it may comprise of three projections: Voice, which introduces the external argument and licenses accusative Case; verbalizing v, which marks the eventuality type *be*, *do*, *become*, and *cause* (Folli and Harley 2005) and a categorial lexical root (see e.g., Alexiadou and Anagnostopoulou 2006, Harley 2013, Cuervo 2015, Harley 2017). Within the Minimalist Program (Chomsky 1995), Pylkkänen (2008) proposes the Voice-bundling parameter, in which languages either employ a fused functional head which unifies the functions of Voice and little v⁶(i.e., categorial and Voice features) in a single projection, or separate little v and Voice heads that carry these features. I discuss Pylkkänen’s (2008) proposal and arguments in the coming section.

3.2. Voice-Bundling Theory (Pylkkänen 2002, 2008)

In order to account for the syntactic behaviors and variations of causative constructions across languages, Pylkkänen (2002, 2008) develops her proposal by introducing the concept of Voice-bundling and the Voice-splitting parameter. In her proposal, causative verbs universally have a causer argument which their non-causative counterparts lack, but it is not correct to assume that causative verbs are formed by the addition of a head that introduces a causer argument to the semantics of a verb. On the other hand, what universally distinguishes causative verbs from their non-causative counterparts is “a syntactically implicit event argument ranging over *causing events*[. For her,] all causative constructions involve the CAUSE head [which combines with non-causative predicates and] introduces a causing event to their semantics” (Pylkkänen 2002: 75), rather than a causer. Considering vP CAUSE, which carries the interpretable features of causativity and provides the semantics for the intended causative meaning, she proposes that while CAUSE and Voice are separate pieces in the universal inventory of functional heads, they can be fused in a single functional head in the lexicon of a particular language. In such a language, Voice and CAUSE form a similar feature bundle as tense and agreement (Pylkkänen 2008). Her argument provides ground for the classification of crosslinguistic variations in causative constructions, which have two structural sources:

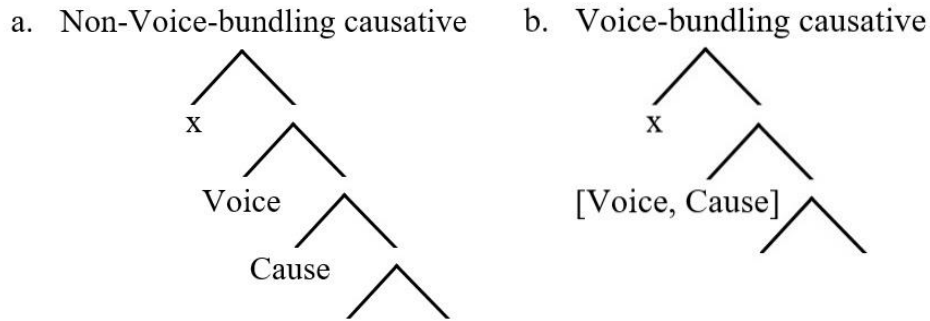
⁶ Pylkkänen (2002, 2008) proposes several additional projections: the high and low Applicative phrases as well as a Voice phrase and a vP.

- a. Voice bundling, that is, whether CAUSE and Voice are fused in the same head or in separate syntactic heads.
 - b. Selection, that is, what type of complement CAUSE selects for.
- (Pylkkänen 2008)

First, she introduces a *Voice-bundling* parameter and argues for two variations cross-linguistically. Voice-bundling refers to the “syntactic realization of cause: either CAUSE can occur as its own syntactic head, or it can be ‘bundled’ with the external-argument-introducing Voice into a complex head” (Pylkkänen 2008: 84).

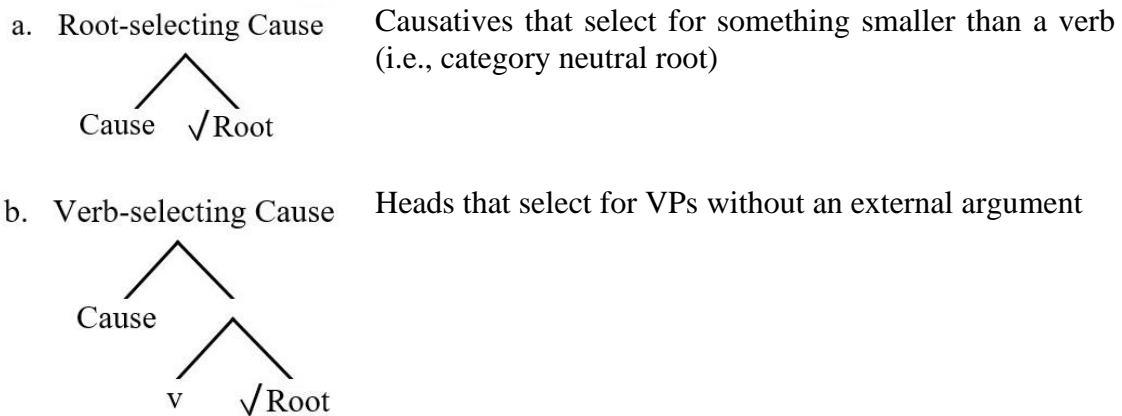
So, a Voice-bundling language (e.g., English and Ch’ol (Pylkkänen 2008, Harley 2017)) would have the structure in (1b) which unifies the functions of Voice and little *v* in a single projection. On the other hand, in a Voice-splitting language (e.g., Japanese, Chemehuevi, and Hiaki (Pylkkänen 2008, Harley 2017), Voice and little *v* heads perform their different functions independently as Figure 1(a).

Figure 1: Variation in Voice-bundling (Pylkkänen 2008)

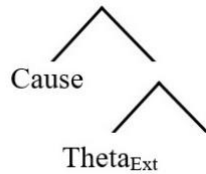


Furthermore, the second cross-linguistic variation, she refers to, is complement size (Pylkkänen 2008). Based on her argument, causative heads divide into three types, as in Figure 2.

Figure 2: Selectional variation (Pylkkänen 2008)



- c. Phase-selecting Cause Heads that select for constituents containing an external argument



The first type, as shown in Figure 2(a), is a causative head that selects for a *category neutral root* and acts as the *root's verbalizer* at the same time. The second type, Figure 2(b), is a causative head that selects for VPs with no *an external argument*. And, finally, the third type, Figure 2(c), shows the structure for a *verbal constituent* and its *external argument* (Nabors, 2018).

3.3. Interim Summary

So far, I have reviewed various arguments about VP split constructions which provide ground for Pylkkänen's (2002, 2008) arguments about Voice-bundling constructions and the cross-linguistic variations. Pylkkänen's classification distinguishing Voice-bundling from non-Voice-bundling languages may be supported by evidence from English, Japanese, Ch'ol, Hiaki and Chemehuevi (Pylkkänen 2008, Harley 2017).

However, it seems that there are some languages that do not support the hypothesis. Key's (2013) study of causeless structures in Turkish suggests that the verbalizing and causativizing functions of vCAUSE are only bundled in lexical causatives (Harley 2017). Furthermore, based on the reviewed literature, I face two arguments: Harley (2017) provides arguments to consider Persian as a Voice-bundling language, focusing on *light-verb alternation causatives* and Nabors (2019) provides arguments to consider Persian as a non-Voice-bundling language based on the construction of Persian morphological causatives. Accordingly, the main questions to be addressed are:

- a. Is it possible for a language to include both Voice-bundling and Voice-splitting structures? What does this imply for Pylkkänen's (2008) hypothesis?
- b. How can unified descriptive structures for Persian causatives be supported?

In the following sections, I introduce the causative constructions in Persian and explain the main arguments behind the proposed structures by Harley (2017) and Nabors (2019). Finally, I suggest possible tree structures for Persian morphological light-verb alternation and syntactic/periphrastic causative structures.

4. Persian Causative Constructions

This part deals with the syntax of causative constructions in Persian. I start with the description of the different types of causative constructions in Persian and address the related structures in the light of Pylkkänen's (2008) Voice-bundling proposal.

4.1. Typology of Persian Causatives

Persian, like many other languages, shows causation in different ways. It distinguishes four types of causatives: lexical, light-verb alternation, morphological and periphrastic/syntactic causatives. This section describes different types of causatives and proposes tree structures for them.

Lexical causatives. One type of causative constructions is lexical causatives. In Persian, some verbs have a suppletive counterpart. In lexical causatives, the causative form is lexically distinct from the corresponding non-causative verb, which in Persian is always intransitive (e.g., English *kill* vs. *die*). “Lexical causatives occur in Persian, as demonstrated by contrasting the intransitive verbs below with their transitive counterparts” (Erfani 2014: 33).

(14)

- | | | | |
|----|-------------------------|---------------------------|--------------------|
| a. | <i>amadan</i> ‘to come’ | <i>avardan</i> ‘to bring’ | |
| b. | <i>mordan</i> ‘to die’ | <i>koshtan</i> ‘to kill’ | (Dehghani 1996: 2) |

In (15a) and (15c), the intransitive verbs *mord* ‘died’ and *amad* ‘came’ express the fact that the subject died and came respectively, without necessarily involving causation. However, in (15b) and (15d), the lexical verb *kosht* ‘killed’ and *avard* ‘brought’ express the idea that ‘the act of killing’ and ‘the act of bringing’ are completed by an agent, yet there are no overt morphemes that express causation.

(15)

- | | | | |
|----|----------------------------|------------------|--|
| a. | <i>mush</i> | <i>mor-d.</i> | |
| | mouse | die-PAST | |
| | ‘The mouse died.’ | | |
| b. | <i>Sina mush-ra</i> | <i>kosh-t.</i> | |
| | Sina mouse-ACC | kill-PAST | |
| | ‘Sina killed the mouse.’ | | |
| c. | <i>baba</i> | <i>ama-d-∅.</i> | |
| | father | come-PAST. 3SG | |
| | ‘The father came.’ | | |
| d. | <i>Sara baba-ra</i> | <i>avar-d-∅.</i> | |
| | Sara father-ACC | bring-PAST. 3SG | |
| | ‘Sara brought the father.’ | | |

Morphological causatives. The second type of causative construction that exists in Persian is the morphological causative. In this type of causative, the causative predicate is related to the non-causative predicate by morphological affixation. Persian morphological causatives are formed by the addition of a causative morpheme *-an*⁷ to the root. (16a) is an example of the inchoative or intransitive simple verb, while (16b) depicts the transitivized causative forms of the verb.

(16)

- | | | | |
|----|--------------------|-------------------|--|
| a. | <i>khane</i> | <i>sukh-t-∅.</i> | |
| | house | burn-PAST.3SG.SBJ | |
| | ‘The house burnt.’ | | |

⁷ The causative morpheme *-an* is suffixed to the root before the later suffixation of tense and agreement.

- b. *Ali khune-ra suz-an-d-φ.*
 Ali house-ACC burn-CAUS-PAST.3SG.SBJ
 ‘Ali burnt the house.’ (Nabors 2019: 83)

The causative morpheme *-an* in Persian can combine with either transitive, unergative, or unaccusative simple verbs, as in Table 1.

Table 1: Transitivity and morphological causatives (Nabors 2019: 84)

	SIMPLE VERB (INFINITIVES)	CAUSATIVE	TRANSLATION
UNACCUSATIVE	<i>laghzidan</i> ⁸	<i>laqzandan</i>	to slip
	<i>sukhtan</i>	<i>suzandan</i>	to burn
	<i>jushidan</i>	<i>jushandan</i>	to boil
UNERGATIVE	<i>paridan</i>	<i>parandan</i>	to fly
	<i>neshastan</i>	<i>neshandan</i>	to sit
	<i>takhtan</i>	<i>tazandan</i>	to gallop
TRANSITIVE	<i>pichidan</i>	<i>pichandan</i>	to twist, wrap
	<i>chasbidan</i>	<i>chasbandan</i>	to stick
	<i>khordan</i>	<i>khorandan</i>	to eat

Moreover, there is a constraint on Persian morphological causativisation: “when the verb has a lexical causative counterpart, it cannot be causativised by the causative suffix” (Dehghani 1996). The examples provided in (17) illustrate some such verbs and their lexical causative counterparts.

- (17)
- | | | | |
|----|-----------------------------|-----------------------------------------|----------------------|
| a. | <i>ama-d</i> ‘came’ | <i>avar-d</i> ‘brought’ | <i>*ama-an-d</i> |
| b. | <i>mor-d</i> ‘died’ | <i>kosh-t</i> ‘killed’ | <i>*mor-an-d</i> |
| c. | <i>barkhas-t</i> ‘stood up’ | <i>boland kard</i> ‘made someone stand’ | <i>*barkhas-an-t</i> |
- (Dehghani 1996: 2)

Accordingly, it is ungrammatical to causativize the lexical verb like *amad* ‘came’ that has a causative counterpart *avard* ‘brought’ by adding Persian causative suffix, *-an*, resulting in **ama-an-d*.

Light-verb (LV) alternation. The third type of causatives in Persian is *light-verb alternating* (Nabors 2019). The LV alternating causative in Persian is formed with a complex predicate. In Persian, complex predicates are verb forms that can be formed from a non-verbal element and a light verb like *kard* ‘do’ or *shod* ‘become’ (Karimi 1997; Folli and Harley 2005; Megerdooian 2011). Four examples of complex predicates are provided in (18).

⁸ *laghz-i-d-an*
 slip-verbalizer-PAST-INF

(18)

- a. N+LV *khar kardan* '(donkey doing), to fool'
 b. Adj+LV *pahn kardan* '(wide doing), to widen, to spread'
 c. Adv+ LV *bala avardan* '(up bringing) to vomit'
 d. PP+ LV *be bad dadan* '(to wind giving) to waste'

(Folli and Harley 2005)

LV alternating causatives show causativization by alternating the LV element between *shod* 'become' and *kard* 'make' to form intransitive and transitive verbs, respectively. This is the most common type of causative in Persian and has been called *equipollent* in Jasbi (2011) and *non-equative compound lexical causative* in Dehghan and Golfam (2012).

(19)

- a. *bastani ab sho-d-φ.*
 ice-cream water become-PAST. 3SG
 'The ice-cream melted.'
- b. *aftab bastani-ra ab kar-d-φ.*
 sun ice cream-ACC water make-PAST.3SG.SBJ
 'The sun melted the ice-cream'

(Nabors 2019: 82)

In (19a) the intransitive light verb *shod* 'became' in *ab shod* 'became water' alternates with *kard* 'made' in *ab kard* 'made water' in the causative sentence (19b).

Syntactic/periphrastic causatives. All verbs in Persian can be causativised syntactically, where the verb to be causativised occurs in a complement clause preceded by the compound verb *baes shodam* 'to cause' (Dehghani 1996) that is formed as a complex predicate. This type of causative construction is called syntactic/periphrastic causatives (Nabors 2019). Consider (20a-b).

(20)

- a. *Ali Khab-id.*
 Ali sleep- VERBLZ.3SG.
 'Ali slept.'
- b. *man baes sho-d-am ke Ali be-khab-ad.*
 I cause become-PAST-1SG.SBJ REL Ali INF-sleep-3SG
 'I caused Ali to sleep.'

(Dehghani 1996: 1)

Here, the causativity is expressed in the form of a complement clause, where the N(oun)P(hrase), *Ali*, which is the causee, becomes the subject of the embedded clause (*ke Ali bekhabad*), and the subject position of the main clause is occupied by the causer, *man*. The verb of the embedded clause has person and number agreement but no tense.

The difference between this causative and the light-verb alternating causative is the role of the non-verbal element in the complex predicate.

Syntactic/periphrastic causatives are formed by using vocabulary items that express causativization in the non-verbal element of the complex predicate,

which takes a complement clause. Therefore, syntactic/periphrastic causatives are always bi-clausal. (Nabors 2019: 82)

Additionally, they can also allow the alternation expressed by the LV causatives in the main clause, which is depicted in (21a) and (21b).

(21)

- a. *Sahar Maryam-ra majbur kar-d ke ketab-ra*
 Sahar Maryam-ACC force do-PAST.3SG REL book-ACC
be-khan-ad-φ.
 INF-read-PAST-3SG
 ‘Sahar forced Maryam to read the book.’
- b. *Maryam majbur sho-d ke ketab-ra be-khan-ad-φ.*
 Maryam force do-PAST.3SG REL book-ACC INF-read-PAST-3SG
 ‘Maryam was forced to read the book.’

In the example provided above, *majbur kard* ‘made force’ is used in the causative form in which the light verb *kard* (21a) is in complementary distribution with *shod* in the passive form *majbur shod* ‘was forced to do’ (21b). More examples of syntactic/periphrastic causatives are *vadar kard* ‘make do’ and *majbur kard* ‘force do.’

4.3. Persian Causatives: Arguments on Voice-Bundling Structures

In this section, I review two main arguments on the bundling nature of Persian causative constructions focusing on Harley (2017) and Nabors (2019).

Persian as a Voice-bundling language (Harley 2017). In her introduction on ‘*The Bundling Hypothesis and the Disparate Functions of Little v*’, Harley (2017) considers the functions of little *v*, following Pykkänen (2008), and the case of bundling in several languages (Ch’ol, Persian, Hiaki and Chemehuevi).

If the functions of Voice and little *v* are subsumed by a single head, there should only be a single morpheme that accommodates all functions. This has implications for languages like Persian, where virtually all⁹ verbal expressions consist of a light verb, realizing *v*, and a separate non-verbal predicate supplying lexical content. If the *v* head in Persian bundles both Voice and *v* functions together, then the only way to demote the Agent is to change the light verb, i.e., if there is a single *v* head, then the agent-introducing version should be in complementary distribution with the non-agent-introducing version. (Harley 2017: 7)

As she mentions, if there is a single little *v* head, then agent-introducing light verb should be in complementary distribution with the non-agent-introducing light verb. To clarify her argument, she provides an example of the Persian in (22).

⁹ Actually, it seems that Harley (2017) only focused on the light-verb causative constructions not all of the four types and ignored Persian simple verbs in which the verbal expression is not expressed in the form of a light verb and a non-verbal element.

(22)

- a. *tim anha-ra shekast dad.*
 team they-ACC defeat gave
 ‘The team defeated them.’
- b. *tim az una shekast khor-d-φ.*
 team of them defeat collide-PAST.3SG
 ‘The team was defeated by them.’ (Harley 2017: 8)¹⁰

Accordingly, in (22a), there is an agentive light verb, *dadān* ‘to give,’ which introduces the agent and the clause *tim anha ra shekast dad* contains an agent argument *tim*, while in (22b), an entirely different, non-agentive light verb is substituted, *khordan* ‘collide’. As it was discussed before, this process is called “light verb alternation” and it is identical with causative/inchoative alternations in Persian, which also involve substituting a non-agentive for an agentive light verb (Harley 2017). Consequently, Harley (2017) considers Persian to be a bundling language, since:

- a. There is an identical head¹¹ responsible for passive-like structures, inchoative structures, causative structures, and agentive structures and passive-like structures aren’t built on top of agentive structures.
- b. The light verb head that is substituted to eliminate an Agent argument is the only verb in the clause. The main predicate in all Persian complex predicates is non-verbal¹². (Harley 2017)

Accordingly, Harley (2017) concludes that Persian is a Voice-bundling language, where verbalization and agent-introduction are all controlled in a single *v* head. This proposal works perfectly for the light verb constructions in Persian, but other construction may not follow the same procedure and a single head cannot be responsible for both Voice and little *v* functions. There is another subset of Persian verbs that form morphological causatives and based on the argument provided by Nabors (2019), the functions of Voice and little *v* cannot be expressed in the single head so Persian morphological causatives are non-Voice-bundling. I review the main assumptions behind the second proposal in the next section and the possible weakness and strength of each proposal will be discussed in §5.

Persian as a non-Voice-bundling language (Nabors 2019). Nabors (2019) provides a theoretical analysis to address the restriction on the causative morpheme that exists in Persian and marks some verbs for causation, but not others. The focus of this paper is the causative construction formed from simple verbs in Persian, labeled as morphological causatives. To this end, this part starts with this proposal on simple verbs in Persian: “Simple verbs are formed from a root plus verbalizer, and this verbalizer can be null in the alternating class of simple verbs (*afraz/afraš* ‘raise’) or overt in the *-id* class of verbs (*raghs/raghsid* ‘dance’)” (Nabors 2019: 78).

¹⁰ I made a subtle change to the original example to make the example less complicated without touching the main concept.

¹¹ This is diagnosed by complementary distribution.

¹² The two properties of agent-introduction and verbalization, then, are united in a single head in Persian.

Table 2 illustrates the types of verbal structures (overt and covert verbalizer) and the availability of a morphological causative form for each.

Table 2: Causation pattern (Nabors 2019: 79)

	SIMPLE VERB		CAUSATIVE FORM	
OVERT VERBALIZER	dozd-i-d	‘stole’		*
	raghs-i-d	‘danced’	raghs-an-d	‘made dance’
NULL VERBALIZER	rikh-∅-t	‘spilt’		*
	suz-∅-t	‘burnt’	suz-an-d	‘burned’

According to Table 2, the type of verbalizer present in the structure cannot predict whether the verb has a causative morphological counterpart or not. Nabors (2019) argues that Persian simple-verb causatives are formed with a root-attaching causative morpheme and this morpheme cannot bundle under the same head with little *v*. Consequently, the non-Voice-bundling structure is expected. After introducing the concept of causative construction in general, Nabors’s (2019) paper introduces types of causative construction in Persian: lexical, light verb alternations, periphrastic and morphological.

Considering two main reasons, the paper considers the morphological causative morpheme, *-an-*, to be root attaching: (i) The overt verbalizer is shown to be in complementary distribution with the causative affix (23a). (ii) Nothing intervenes between the causative morpheme and the root in Persian as in (23b).

(23)

- a. *bachche khab-i-d.*
 child sleep-VERBLZ-PAST.3SG
 ‘The child slept.’
- b. *Samaneh bachche-ra khab-an-d.*
 Samaneh child-ACC sleep-CAUS-PAST.3SG
 ‘Samaneh put the child to sleep.’

In the next step, Nabors (2019) provides her argument on the bundling nature of the morphological causatives focusing on Pytkänen’s (2008) chart (Table 3) for a root-selecting Causative head.

Table 3: Root-selecting causative typology (Pylkkänen 2008, cited in Nabors 2019: 84)

VOICE-BUNDLING		NON-VOICE-BUNDLING	
a.	Unaccusative causatives not possible	a.	√ Can have unaccusative causatives
b.	Causative based on unergative or transitive impossible.	b.	√ It is possible to make unergative and transitive causatives
c.	Category-defining morphology cannot intervene between the root and Cause.	c.	Category-defining morphology cannot intervene between the root and CAUSE.
d.	Adverbial modification below CAUSE must be root modification.	d.	Adverbial modification below CAUSE must be root modification.

Items (c) and (d) in the Voice-bundling and non-Voice-bundling columns are identical in both Voice-bundling and non-Voice bundling languages and don't provide any characteristic distinctions between Voice-bundling and non-Voice bundling causatives. On the other hand, the first two items can be used as the diagnostics here. Based on Table 3, in a non-Voice-bundling language, unaccusative, unergative and transitive causatives are possible. Nabors (2019) argues that the constructions equivalent to 'John slept the child' and 'John cried the baby', which are not possible in English, are acceptable in Persian. To make these structures grammatical in English, it is necessary to paraphrase them as 'John put the child to sleep' and 'John made the baby cry' respectively. Given that morphological causatives in Persian can be formed from unaccusatives and unergatives and transitives (item b), Nabors (2019) assumes that this morpheme in Persian is a non-Voice-bundling CAUSE head.

Proposed Persian causative constructions. So far, I have reviewed the typology of causative constructions in Persian preceding two main hypotheses on the construction of morphological and light verb causatives in line with the concept of Voice-bundling languages (Pylkkänen 2008). The analyses provided here make predictions about the tree structures of tree types of causatives (i.e., morphological, light verb alternation and syntactic-periphrastic).

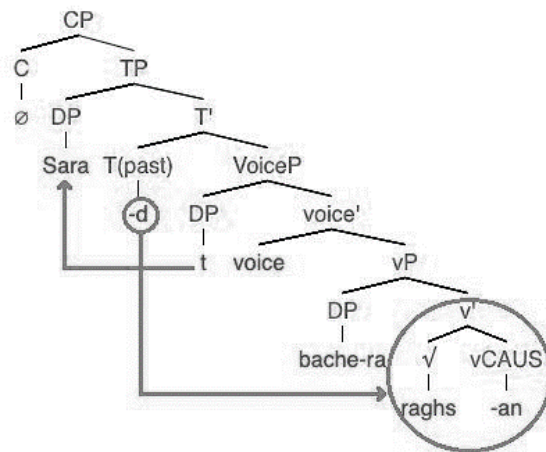
Following Nabors (2019)¹³, I assume that in morphological causatives, Voice is separate from the causative head and the expected structure is non-Voice-bundling. Accordingly, based on the structure proposed for (24), the unergative verb *raghs* 'dance' has an agentive subject, *Sara*, and its internal argument, *bache*.

¹³ The main concept behind the proposed structures is based on the structures and the framework proposed by Nabors (2019) by applying some modifications.

- (24) *Sara bache-ra raghs-an-d.*
 Sara child-ACC dance-CAUS-PAST.3SG.SBJ
 ‘Sara caused the child to dance.’ (Lit: ‘Sara danced the child’) (Nabors 2019)

The agentive subject (i.e., external argument), *Sara*, occupies the specifier position of the VoiceP which raises to occupy the specifier position of TP. As Nabors (2019) discussed in her arguments, the causative morpheme *-an* is a root-attaching morpheme that attaches the root *raghs*. The unattached past tense affix *-d* occupying T position lowers onto the verb *raghs* through the morphological operation Affix Hopping resulting in (25):

- (25) Persian morphological causative tree structure

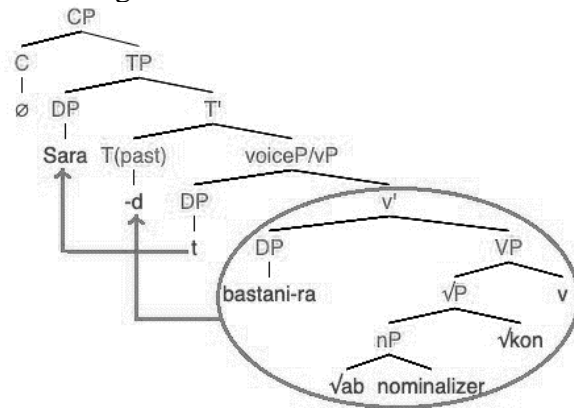


Consequently, I draw the tree based on the non-Voice-bundling nature of morphological causatives. On the other hand, in light verb causatives, based on Harley’s (2017) assumption about Voice-bundling languages, if the functions of Voice and little *v* are expressed in a single head, there should only be a single morpheme that accommodates all functions. This provides ground for her analysis of the construction of Persian light verb causatives, where all verbal expressions consist of a light verb (i.e., *v*) and a separate non-verbal predicate supplying lexical content (Harley 2017). Accordingly, assuming the *v* head in Persian bundles the functions of Voice and *v* in (26). Then, the only way to introduce the causer *Sara*, is to change the non-causative light verb *shod* (26a) to the causative light verb *kard* in (26b). In this sense, the light verbs *shod* and *kard* are in complementary distribution.

- (26)
- a. *bastani ab sho-d.*
 Ice cream water become-PAST.3SG
 ‘The ice-cream melted.’
- b. *Sara bastani-ra ab kar-d.*
 Sara ice cream-ACC water make- PAST.3SG.SBJ
 ‘Sara melted the ice-cream.’

In line with the nature of Voice-bundling languages, I assume the functions of Voice and little *v* to be bundled in a single head VoiceP/*v*P and the root to alternate between non-causative (i.e., *sho*) and causative form (i.e., *kar*). Accordingly, the structure presented in (27) is expected.

(27) Persian light-verb causative tree structure



After having an overview of the typology of Persian causative constructions and providing examples to illustrate each type, I provided two arguments about the bundling nature of morphological and light-verb alternation proposed by Nabors (2019) and Harley (2017). Based on the arguments provided in the paper, Persian morphological causatives possess a non-Voice bundling structure in which the functions of little *v* and Voice heads that carry these features separately. However, Persian light-verb alternations have a bundled structure in the sense of Pylkkänen (2008) in which a fused functional head unifies the functions of Voice and little *v* (i.e., categorial and Voice features) in a single projection. These findings have some implications for the typology of causative construction cross-linguistically that will be discussed in §5.

5. Discussion

In this paper, I have reviewed the typology of Persian causative constructions (i.e., lexical, morphological, light verb alternation, and syntactic/periphrastic). I have also introduced two hypotheses proposed by Harley (2017) and Nabors (2019) on the bundling structure of Persian causative constructions in light of Pylkkänen's (2008) proposal. In the light-verb alternation class of verbs, the verbal element (i.e., light verb) contributes causative semantics as well as verbal form. Harley (2017) proposed that Persian light-verb causatives can be considered as Voice-bundling where verbalization and agent-introduction are all realized in a single *v* head. This proposal works perfectly for the light verb constructions in Persian, but other causative constructions in the language have different properties and a single head cannot be responsible for both Voice and little *v* functions (Nabors 2019, Folli et al. 2005, Karimi 1997). Nabors (2019) argued that Persian morphological causatives are formed with a root attaching causative morpheme, *-an*, and this morpheme cannot bundle under the same head with little *v*.

Moreover, she regarded the morphological causative morpheme, *-an-*, to be root attaching, for two reasons: "(i) nothing intervenes between the causative morpheme and the root in Persian as and (ii) the overt verbalizer is in complementary distribution with the

causative affix” (Nabors 2019). She provided arguments to consider Persian morphological causatives non-Voice-bundling: in a non-Voice bundling language, unaccusative, unergative and transitive causatives are possible; in a Voice-bundling language, they are not. Nabors (2019) argued that Persian allows unaccusative causative constructions like *Sara bachera raghsand* ‘Sara danced the child’ which is not possible in English (a Voice-bundling language). Given that morphological causatives in Persian can be formed from unaccusatives and unergatives and transitives, Nabors (2019) assumed causative morpheme in Persian to be a non-Voice-bundling CAUSE head.

Based on the data provided, I can conclude that both Voice-bundling and non-Voice-bundling constructions can be present in Persian. This has an important implication for Voice-bundling theory: given that the theory of Universal Grammar (Chomsky 1981) consists of a set of universal principles proposed to be common to all human languages, and a number of parameters that define the certain ways in which languages may vary, these parameters should be binary. In other words, either a parametric feature is present in a given language, or it is not. Bundling of Voice and little *v* cannot be parametrized, contra Pylkkänen (2008); if Voice-bundling is considered as a parameter, it should be either on or off in a language. Nevertheless, both bundled and non-bundled constructions exist in Persian. These findings in Persian have a parallel in the Turkish causative construction. Key’s (2013) study of Turkish suggests that the verbalizing and causativizing functions of Voice are only bundled in lexical causatives. There is, thus, independent supporting evidence that Voice-bundling is not parametrized.

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