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Dead or Alive: A Lifetime Effect of Pomak Nominal Tense in a Self-Paced Reading Experiment

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Abstract: Nominal tense is a cross-linguistically rare and understudied phenomenon, with past vs. non-past being the minimal distinction. In some languages, past nominal tense implies the reading 'deceased', while in others, lifetime effects (i.e., implicatures about whether an individual is dead or alive) restrict its use with permanent properties (as with kinship terms). In our study, we investigate for the first time the online processing of lifetime effects in sentences with past nominal tense and kinship terms following contextual information about an individual's lifetime status (dead or alive). An end-of-sentence acceptability judgment task completes the study. Evidence comes from 25 speakers of Pomak (Slavic, Greece) who use the realis past suffix to form, among others, definite articles, contrasting with a generic suffix for the future, habitual, and irrealis. In collaboration with a local Pomak research assistant, we prepared 80 experimental sentences with past nominal tense in four conditions, manipulating *Lifetime Status* (dead × alive) and *Tense Concord* between nominal and verbal tense/aspect (congruent × incongruent). Our results suggest that past nominal tense with kinship terms triggers a lifetime effect which is apparent during online processing. In the sentence final region, dead referents with future verbal tense are read faster, possibly due to the overtness and severity of the violation. Reading disruptions for dead referents while processing nominal tense are also discussed. In the acceptability task, participants rated sentences only based on the agreement of the lifetime status with verbal tense/aspect as the violation is overt and severe. The present study therefore offers support to previous reports of lifetime effects in other languages with nominal tense, highlighting another similarity between nominal and verbal tense.

Keywords: processing; reading; nominal tense; verbal tense; lifetime effect; Pomak

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1. Introduction

Nominal tense, whereby tense, aspect, and modality are encoded in nominals through inflectional morphology, is a cross-linguistically rare and understudied phenomenon (Lecarme 2012; Nordlinger and Sadler 2004). A cross-linguistic study by Nordlinger and Sadler (2004) found that the minimal distinction in languages with nominal tense is past vs. non-past. Past nominal tense, in particular, locates the referent in the past with respect to the time of the utterance. In some languages, past nominal tense further implies the reading 'deceased', e.g., Halkomelem (Burton 1997; Wiltschko 2003), Movima (Haude 2004), and Tariana (Aikhenvald 2022). In others, the 'ceased to exist' reading of past nominal tense restricts its use with permanent properties, like kinship terms, as lifetime effects are triggered (i.e., implicatures about whether an individual is dead or alive), e.g., Mbyá (Thomas 2014). In the present study, we investigate for the first time the online processing of lifetime effects in sentences with past nominal tense and kinship terms following contextual information about an individual's lifetime status (dead or alive). An end-of-sentence acceptability judgment task completes the study. Evidence comes from Pomak, a minoritized Slavic variety spoken in Greece (Adamou 2010). The remainder of this introduction is structured as follows: In Section 1.1, we present an overview of nominal

tense and discuss more specifically the lifetime effect of past nominal tense. In Section 1.2, we offer some background on past nominal tense in Pomak, and in Section 1.3, we present the experimental literature on processing lifetime effects.

1.1. Past Nominal Tense and the Lifetime Effect

Nominal tense is defined as 'the existence of tense/aspect/mood as an inflectional category for nominals' (Nordlinger and Sadler 2004, p. 776) or as the use of 'grammatical morphology on argument nominals whose temporal interpretation is independent from the temporal interpretation of the clause' (Lecarme 2012, p. 698).[1] The restriction of the definition to argument nominals sets nominal tense apart from the use of tense, aspect, and modality markers with nominals that function as the predicates of a clause. The mention of its inflectional status in the definition sets nominal tense apart from lexical derivation (e.g., *ex-husband* in English) and adjectival modifiers (e.g., *former* in English). Nominal tense has scope over the noun phrase and, in some languages, can also have scope over the entire clause (Nordlinger and Sadler 2004).

According to Lecarme (2012), there are three possible sets of time for the interpretation of nominal tense: (i) the predication time of an individual, (ii) the possessive time, and (iii) the existence time of an animate individual, an object, or an event. This means that, in addition to the temporal anteriority of past nominal tense, its use would imply that: (i) the individual ceased to hold the property described by the predicate (e.g., *former president*), (ii) the individual ceased to be in a possessive relation (e.g., former house), or (iii) the individual ceased to exist (e.g., *late grandmother* (i.e., deceased), *former house* (i.e., destroyed)).

The example in (1) from Halkomelem, a Salishan language, illustrates how when the (nominal and clausal) past marker -lh is suffixed to the noun 'grandmother' comprehenders can infer that the timespan of being a grandmother is in the past and, since being a grandmother is a lifetime property, that the referent's existence is also in the past (Burton 1997; Wiltschko 2003).

(1) Halkomelem (Central Salish, Salishan)

El-éliyemet-tsel-cha	the-l	sí:lá:-lh
RDP-dream_about-1SG.SBJ-FUT	DEF.F-my	grandparent-PST

'I'll be dreaming about my late grandmother'. (Nordlinger and Sadler 2004, p. 782)

Another example comes from Movima, an unclassified Bolivian language. In (2a), the article *kinoj* is used for an absent and accessible referent, 'aunt', contrasting with the article *isnoj* in (2b) used for a referent that has ceased to exist, that is, with the reading 'late aunt'. Because Movima articles can also have scope over the entire clause, it can be seen in (2c) that the article *isnoj* may sometimes override the 'deceased' reading.

(2) Movima (Isolate)

a.

kinoj	ney	ay'ku	di'	jayna	kayni
ART.F.ABSN	DEF	my_aunt	REL	already	be_dead

'That (absent) aunt of mine who died [yesterday]'. (Haude 2004, p. 84)

b.

la'	n-oj	soń-tino:na'	kayni	isnoj	ay'ku
before	OBL-ART.N	other-N.INCP:year	be_dead	ART.F.PST	my_aunt

'Last year my aunt died'. (Haude 2004, p. 84)

c.

n-asko	elaná = uj	pa'	isnoj	ma'
OBL-PRO.N.ABSN	leave = ART.M	my_father	ART.F.PST	my_mother

'At that (time) my father left my mother'. (both absent, but alive) (Haude 2004, p. 87)

Similarly, in Tariana, an Arawak language from Brazil, the completed nominal past tense marker has three different meanings: 'deceased', 'former', and 'poor thing' (Aikhenvald 2022). Moreover, Thomas (2014) proposes a unified analysis of *-kue* in Mbyá (Tupí-Guaraní) as in relative past tense both in its nominal and clausal uses. In the analysis, the existence and change in state properties noted in the nominal uses are temporal implicatures and combine with the presuppositions of the noun phrases. Specifically, the

restrictions of *-kue* with permanent properties are pragmatic lifetime effects that can more generally be observed with past tense individual-level predicates.

Indeed, in languages with verbal tense like English, a lifetime effect arises through the use of present or past verbal tense for individual-level predicates as the comprehender makes an inference about the lifetime status of the referent (dead or alive). For example, in an out-of-the-blue utterance like *Gregory was from America*, one infers that Gregory must be dead at the time of the utterance. If one knows that Gregory is alive, then the utterance is infelicitous. In a Gricean framework, Musan (1995) argues that this lifetime effect is a temporal implicature that arises from the use of past tense in combination with the predicate, *be from America*, that is denoting a permanent property. In this paper, we investigate the lifetime effect of past nominal tense in Pomak. In the next section, we introduce nominal tense in Pomak.

1.2. Nominal Tense in Pomak

Pomak or *Pomatsko* refers to the Slavic varieties traditionally spoken by Muslim communities living in Bulgaria (about 100,000 people), Greece (about 36,000 people), and Turkey (between 300,000 and 600,000 people) (Adamou and Fanciullo 2018). Today, not everyone who identifies as Pomak is also a speaker of Pomak, as a strong language shift is taking place in each country toward the locally socially dominant language. Adamou (2011) is the first study to refer to nominal tense in Pomak, discussing evidence from a variety spoken in Xanthi, in Greek Thrace. The analysis follows the *situational anchoring* framework (Culioli 1999). Similar uses were previously described in the Bulgarian Rhodope dialects, albeit without reference to the literature on nominal tense (Kanevska-Nikolova 2006). In most Pomak varieties spoken in Bulgaria, however, nominal tense is currently being lost due to the influence of Standard Bulgarian, a language that does not have nominal tense (Fanciullo 2019).

In the Pomak variety from Greek Thrace, nominal tense is expressed through deictic suffixes that are used to form definite articles, demonstratives, possessive pronouns, relative pronouns, and temporal subordinators (Adamou 2011). The encoding of nominal tense through definite articles is a relatively common cross-linguistic feature (Lecarme 2012). Specifically, the Pomak deictic suffixes are used in here-and-now situations (where the situation of an event, Sit2, is contiguous to the situation of an utterance, Sit0, i.e., Sit2 = Sit0) depending on the distance between the referent and the speech participants: the *s*-suffix is used when the referent is in the speaker's sphere, illustrated in (3a), the *t*-suffix when the referent is in the interlocutor's sphere, in (3b), and the *n*-suffix when the referent is away from both, in (3c). These uses can be manipulated for pragmatic reasons like politeness or social deixis (Adamou 2011).

(3) Pomak (Slavic, Indo-European)

a. |jela nah |matsa-sa
come.IMP.2SG to table-DEF.SPKR
'Come to the table (close to me)!' (Adamou 2011, p. 875)

b. na |matsa-sa
at table-DEF.ADRE
'On the table (close to you)!' (Adamou 2011, p. 875)

c. pri |matsa-sa
next table-DEF.DIST
'Next to the table (away from both of us)!' (Adamou 2011, p. 875)

Crucially, when the noun phrase is located in a space and time frame distinct from the utterance situation (Si2 $\neq$ Sit0) or has no relation to it (Sit2ωSit0), Pomak speakers use the *t*- and *n*-suffixes to encode nominal tense (Adamou 2011). The interlocutor's *t*-suffix is used when the time of the noun phrase is located in the past with respect to the time of the utterance. The distal *n*-suffix is used to locate the noun phrase in the future, irrealis, or habitual (see Adamou 2011 for a detailed analysis).

This is illustrated in the examples in (4), which are based on naturalistic speech and were constructed with the assistance of Pomak language consultants to highlight the contrasts. (4a) illustrates the *s*-suffix, which is restricted to spatial–pragmatic uses in the here-and-now. In (4b), the *t*-suffix is used for a referent that is close to the interlocutor and contrasts with (4c), where the referent is located in the past in relation to the utterance situation; in this context, the glasses are not close to the interlocutor. The distal *n*-suffix is used for the irrealis, as in (4d), habitual (as in the narration of traditions), and future in relation to the utterance situation, as in (4e).

(4) Pomak (Slavic, Indo-European)

a. gju|ʒlutʃi-se |ʒœ-se |nosem (ai|sa) |jatse sa |hubavi
glasses-DEF.SPKR PRO.REL-SPKR wear.1SG now very be.3PL nice
'The glasses that I'm wearing (now) are very nice!' (Adamou 2011, p. 881)

b. gju|ʒlutʃi-te |ʒœ-te |nosis (ai|sa) pa|ratiki sa
glasses-DEF.ADRE PRO.REL-ADRE wear.2SG now ugly be.3PL
'The glasses that you're wearing (now) are ugly'. (Adamou 2011, p. 881)

c. gju|ʒlutʃi-te |ʒœ-te |noseh (la|ni) |beha gu|ljami
glasses-DEF.ADRE PRO.REL-ADRE wore.1SG last_year were.3PL big
'The glasses that I wore (last year) were big'. (Adamou 2011, p. 881)

d. gju|ʒlutʃi-ne mu |beha/|bili gu|ljami
glasses-DEF.IRR DAT.3SG.M were.3PL/were.EVID.3PL big
'The glasses were big for him'. (as part of a tale) (Adamou and Haendler 2020, p. 512)

e. gju|ʒlutʃi-ne |ʒœ-ne ʃe |kupem sa tʃe|rveni
glasses-DEF.FUT PRO.REL-FUT will buy.1SG be.3PL red
'The glasses that I will buy are red'. (Adamou 2011, p. 881)

In (4d), the modal irrealis interpretation of nominal tense morphology in the narration of a tale is accompanied by the use of evidentiality in the verbal system (Adamou 2013). The blending of temporal and modal readings in Pomak is not unique. As Lecarme (2012) observes, modal interpretations are common not only in verbal tense morphology but also in determiner systems. A similar observation is made in Bertinetto (2020), arguing that all combinations of tense, aspect, and modality should be possible in verbal and nominal tense alike. In Table 1, we summarize the uses of the Pomak deictic suffixes from the community in the Xanthi area.

Table 1. Pomak suffixes used with definite articles (adapted from Adamou 2011).

	Spatial–Pragmatic Uses	***Temporal–Modal Uses***
s-suffix	speaker's sphere	—
t-suffix	interlocutor's sphere	realis past
n-suffix	neither speaker's nor interlocutor's sphere	future, habitual, irrealis

To test whether the temporal interpretations of the Pomak suffixes could be experimentally demonstrated, Adamou and Haendler (2020) conducted a study where Pomak speakers were asked whether a referent bearing either the *t*- or the *n*-suffix was located in the past or future. This task would have been impossible in a language without nominal tense, but Pomak participants successfully responded for referents that had no other temporal information than that conveyed by the deictic *t*- and *n*-suffixes (e.g., *my dress*, *my bag*, or *my coat*), as for those with additional pragmatic and semantic information (e.g., *my baby bath*).

In addition to nominal tense, Pomak, as any other Slavic language, has verbal tense. To better understand how nominal and verbal tense work together in this language, Adamou and Haendler (2020) conducted an acceptability judgment experiment. The results showed that participants prefered sentences where the past article was congruent with past verbal tense but could accept sentences where the past *t*-article contrasted with future verbal tense like in (5).

(5) Pomak (Slavic, Indo-European)

?	ʃe	ˈdam	na	ˈkiro	ˈkoʃta-ta	faf	sela|nik	za	ˈbusene	
	will	give.1SG	to	rent	house-DEF.PST	in	NP	for	year-DEF.FUT	

'I will rent the[t-article] house in Salonica for the year'. (future verb, t-article) (Adamou and Haendler 2020, p. 515)

For example, in (5), the past suffix locates the house in the past with the reading 'the former house', affecting the possessive relation. However, this reading can be felicitous in some contexts but not in others; it is felicitous if this is the house the speaker owns and used to live in but no longer does, but it is infelicitous if this is the house the speaker owned but no longer does. Adamou and Haendler (2020) note that there are no implicatures about the existence of the house ('destroyed'). The study, however, does not explore such pragmatic effects in detail. Similarly, Adamou (2011) notes that although nominal tense is used with a variety of nouns, kinship terms may behave differently, but the study does not elaborate further about any possible implicatures like the lifetime effect. According to the analysis, the interlocutor's *t*-suffix is used when the time of the noun phrase is located in the past with respect to the time of the utterance but, depending on the context, like its use with kinship terms, it could be read as 'deceased', what we refer to as the lifetime effect. In our exploratory study, we seek to fill this gap by investigating whether a lifetime effect can be noted when comprehenders process past nominal tense with kinship terms. In the next section, we present a review of the literature on processing lifetime effects.

1.3. Lifetime Effects in Processing

The processing of lifetime effects has been investigated in languages with verbal tense, like English, and tenseless languages, like Chinese, where tense is not realized morpho-phonologically. To date, there are no experimental studies exploring lifetime effects in languages with nominal tense. To our knowledge, the first processing study of lifetime effects is Chen and Husband (2018). The authors conducted a self-paced reading experiment and an acceptability judgment task in English and Chinese where they tested the contradictory inferences arising when one individual is dead and one alive. Participants read brief contextual descriptions about two individuals including information about their lifetime status. In one condition, both individuals were described as being alive; in the second condition, both were described as being dead, and in the third condition, one was described as dead and one as alive. In English, participants read the critical sentence in present simple, which is infelicitous with dead referents, e.g., *They are both very handsome*, and in Chinese, the critical sentence was without any tense marking using *shi* 'be'. The study reported lower acceptability ratings and longer reading times in English when the verbal tense was incongruent with the lifetime status of both referents (present–dead) but not in Chinese (*shi* 'be'–dead), in line with the analysis of Chinese as a language that does not have a past/non-past tense distinction. Importantly, in their self-paced reading experiment, the authors found sentence final wrap-up effects during reading in both languages. This suggests additional computational steps as the readers updated the discourse. These findings have implications for discussions of Chinese tense, in favor of the existence of a covert future/non-future distinction. In addition, in English, when the two referents were described in the contextual sentences as dead, processing costs were only noted in spillover/post-critical verb regions, whereas when one referent was alive and one was dead, processing costs were also found in the immediate post-verb region.

Palleschi et al. (2020) conducted an eye-tracking experiment and a naturalness judgment task to explore lifetime effects in English. Participants read contextual descriptions about famous people including information about their lifetime status, e.g., *Beyoncé is an American performer. She lives in California* (lifetime status: alive) or *Whitney Houston was an American performer. She died in California* (lifetime status: dead). Critical sentences were either in present perfect, e.g., *She has performed in many arenas in the past, apparently*, or in future, e.g., *She will perform in many arenas in the future, apparently*. Participants also rated

these sentences on naturalness. The authors reported longer reading durations for the dead referents in the present perfect condition that were late/cumulative. These sentences also received lower naturalness ratings than the alive referents in the present perfect condition, but the ratings remained relatively high. The authors interpreted this result as evidence that the violation was either undetected or considered less significant. In contrast, they found shorter reading durations for the dead referents in the future condition, a result they attributed to the overtness and severity of the violation. This is corroborated by the very low naturalness ratings.

In summary, only a handful of studies have experimentally examined lifetime effects and none have done so for nominal tensed languages. Further understanding of experimental psycholinguistic outcomes from speakers of languages with temporal distinctions marked on the nominal domain informs linguistic theory (see, for instance, Lecarme 1999; Alexiadou 2008 analyses of Somali and Halkomelem). The available experimental studies on languages with verbal tense showed lower acceptability ratings and less severe reading disruptions in English when the verbal tense was incongruent with the lifetime status but only sentence final wrap-up effects in Chinese, suggesting that lifetime status effects are prone to cross-linguistic differences (Chen and Husband 2018). A study employing more time-sensitive techniques has shown an incongruent/dead referent in the context of future tense in English is detected immediately with short fixation durations in the critical regions (Palleschi et al. 2020).

1.4. The Current Study and Predictions

In the current study, we examine lifetime effects in Pomak, a language with nominal tense. The available psycholinguistic evidence originates from languages that have been extensively researched. The current study offers significant insights by incorporating findings from Pomak—a marginalized language—and thereby contributes to diversity, which is essential for further extending the theory with larger datasets from a more diversified range of languages (see Blasi et al. 2022; Norcliffe et al. 2015).

Our main goal is to test whether a lifetime effect arises during the processing of Pomak past nominal tense. Following Musan (1995) and Thomas (2014), we define the lifetime effect of nominal tense as either the implicature about an individual's lifetime status triggered by the use of past nominal tense or its (in)felicity when there is additional relevant contextual information or common knowledge available about this individual's lifetime status. In our design, we specifically tested the (in)felicity of the lifetime effect following a context that offers information about the lifetime status of an individual (dead or alive). We used a non-cumulative self-paced reading design with an end-of-sentence rating task (Just et al. 1982). This methodology was chosen to allow us to measure word-by-word reading times and provide insights into the time course of interpretation. As Adamou and Haendler (2020) have already provided experimental evidence for Pomak speakers' sensitivity to nominal tense, we do not tackle this research question in the present study.

Following Adamou and Haendler (2020), we argue that past nominal tense in our design denotes a past time reference. Specifically, *past-grandmother* should be felicitous following the lifetime context *dead*. However, infelicitous readings leading to lifetime status effects are expected to increase processing costs as readers struggle to integrate the temporal information during processing. Therefore, we tentatively predict greater reading disruptions, reflected as longer reading times, in conditions where a human referent with an alive status is marked by a past article compared to those with a dead status marked by a past article. If a parallel can be drawn with the results in Chen and Husband (2018), we should find longer reading times immediately following nominal tense. In addition, we should find general costs sentence finally in the same conditions (*alive status/past article*) as readers update the discourse information. We expect that both the reading times and the sentences' judgement data would be modulated by the uses of verbal tense and their congruence with past nominal tense. Specifically, all the *past article/future verbal tense* sentences should receive lower ratings given that the kin terms would trigger the 'deceased'

reading independent from the status in the context. In addition, to the extent that we can compare a reading experiment with an eye-tracking study like Palleschi et al. (2020), we expect shorter reading times in the sentences with overt violations involving a verb, like *dead status/future verbal tense*. This is based on a common observation in reading experiments: when readers encounter obvious violations, they often tend to read more quickly once the violation is spotted (see Jegerski 2013). These should be sentence final effects. Similar to Palleschi et al. (2020), we predict that these sentences should be rated lower in the explicit language judgments as they contain overt and severe violations. Given that Pomak is a language with a clear verb–noun opposition, we expect the violations involving verbal tense to strongly impact both the processing and the explicit judgments. Table 2 summarizes the predictions for the two tasks and the four conditions.

Table 2. Predictions per task and condition.

	a. Status Dead; Past Article; Past Perfect Verb	*b. Status Dead; Past Article; Future Verb*	*c. Status Alive; Past Article; Past Perfect Verb*	*d. Status Alive; Past Article; Future Verb*
Acceptability ratings	high	low	low	low
Reading times at post-noun phrase region	shorter	shorter	longer	longer
Reading times sentence final	shorter	shorter	longer	longer

2. Method

2.1. Participants

A total of 25 Pomak speakers residing in Greece participated in this study (age: mean = 39.07, *SD* = 17.04). Pomak has no official status in Greece and its use is restricted to the family and the community. In the community under study, Pomak participants also spoke Greek and a moderate level of Turkish.[2] After the experimental session, participants responded to a language background questionnaire where they were asked to name the languages they spoke and self-assess their proficiency on a scale from 1 to 5, with 1 being the lowest score and 5 being the highest score (1 = very little; 2 = little; 3 = well; 4 = very well; 5 = perfectly). Proficiency in Pomak was above 3 for all participants (mean = 4.4) and therefore no participant was excluded. Two more languages, Greek and Turkish, were listed; the mean proficiency rates were 4 and 2.96, respectively. Knowledge of other Slavic languages was not reported. In general, Pomaks make occasional visits to Bulgaria and are in contact with Bulgarian migrants in Greece, but the language of communication is variable and intercomprehension with speakers of Standard Bulgarian is relatively limited, not only because of grammatical and phonetic differences but also because of lexical differences and, in particular, because of the use of Turkish words for salutations, counting, and expressing thanks in Pomak and their absence in Standard Bulgarian (Adamou 2010).

Given that Pomak is a minoritized language without a standardized orthography, prior research has primarily relied on oral stimuli (see Adamou and Haendler 2020). In Greece, Pomak is transcribed using both Greek and Latin scripts, paralleling the Greek and Turkish scripts employed in formal education. Conversely, the Cyrillic script is extremely rarely used (Adamou and Fanciullo 2018). Nevertheless, the Latin transcription of Pomak is becoming increasingly prevalent due to its convenience for the community under study, as it is predominantly utilized in routine communications like text messaging and social media. We made sure to include participants that can read Latin script confidently. No participant reported difficulties in completing the task.

2.2. Materials

Our stimuli included a total of 80 critical sentences with past nominal tense shown in four conditions across which *Lifetime Status* (dead × alive) and *Tense Concord* (congruent × incongruent) were manipulated. For the *Lifetime Status* condition, a contextual sentence preceded the critical noun phrase with information about the lifetime

status of a kin referent which was described as either *dead* or *alive*. The critical sentence started with the same kin referent as in the contextual sentence but differed by including a past definite article form suffixed on a first-person possessive determiner (e.g., *my[+past] grandmother*). We used kinship terms because they typically refer to a lifetime property. While *past-husband* (*ex-husband* in English) is felicitous since it corresponds to a relationship that can end, *?past-grandmother* restricts the range of possible interpretations; the reading *ex-grandmother* should be infelicitous since the relationship does not typically end, while the reading *late grandmother* should be felicitous. The critical noun phrase was followed by a transitive verb either in *past perfect* or *simple future*. In the *Tense Concord* condition, the incongruent sentences were obtained by matching and mismatching past nominal tense with verbal tense/aspect (past perfect vs. future), where the future tense marking was unsettling to the context of a past article. Table 3 illustrates this with examples.

Table 3. Examples of sentence stimuli used in the self-paced reading experiment (slashes indicate per-word regions).

Contextual Sentence with Lifetime Status					*R1 Possessive Pronoun + Article + Nominal Tense*	*R2 Noun*	*R3 Verb + Verbal Tense/Aspect*	*R4 Post-Verb Region*	*R5 Post-Verb Region*	*R6 Sentence Final*
a. status dead; past article; past perfect verb										
Imam	yeno	sestra	ta	ye umrala.	Moyta/	sestra/	kupila be/	yeno/	tileorasi/	za mayka hi./
I have	one	sister	who	has died.	My(past)	sister	had bought	one	TV	for her mother.
'I have a sister who is dead. My(-t) sister had bought a television set for her mother'.										
b. status dead; past article; future verb										
Imam	yeno	sestra	ta	ye umrala.	Moyta/	sestra/	şe kupova/	yeno/	tileorasi/	za mayka hi./
I have	one	sister	who	has died.	My(past)	sister	will buy	one	TV	for her mother.
'I have a sister who is dead. My(-t) sister will buy a television set for her mother'.										
c. status alive; past article; past perfect verb										
Imam	yeno	sestra.			Moyta/	sestra/	kupila be/	yeno/	tileorasi/	za mayka hi./
I have	one	sister.			My(past)	sister	had bought	one	TV	for her mother.
'I have a sister. My(-t) sister had bought a television set for her mother'.										
d. status alive; past article; future verb										
Imam	yeno	sestra.			Moyta/	sestra/	şe kupova/	yeno/	tileorasi/	za mayka hi./
I have	one	sister.			My(past)	sister	will buy	one	TV	for her mother.
'I have a sister. My(-t) sister will buy a television set for her mother'.										

We chose not to manipulate nominal tense itself, similar to the design in Chen and Husband (2018) that does not manipulate verbal tense. In addition, we note that in our study the manipulation of nominal tense would have offered a baseline but would not have been infelicitous, as the future/habitual/irrealis suffix is versatile and could have been interpreted in this experimental design as a distal (compatible with dead or alive status), irrealis, since this was an experimental task (compatible with dead or alive status), or future (compatible with alive status). A different design, like in Adamou and Haendler (2020), would have been necessary to successfully restrict the interpretation of the *n*-suffix as future. The critical sentence stimuli were presented over 6 regions of interest. The

(in)felicity between lifetime status and nominal tense could be noticed at the end of the noun phrase in region 2 (R2; see Table 3). The (in)felicity between lifetime status/nominal tense and verbal tense/aspect could be noticed when the participants reached the verb in region 3 (R3). In order to refrain our participants from familiarization effects, 40 filler sentences were intermixed with the experimental sentences. The filler sentences were constructed as excerpts from traditional folktales and included no definite articles. All the stimuli were constructed with a local Pomak research assistant who came from the same community where the experiment was run to avoid issues arising from dialectal differences. Our research assistant spoke Pomak natively from birth and helped us with the naturalness of the stimuli materials.

2.3. Procedure

The experiment was programmed and presented using PsychoPy 3.0 (Peirce 2007). Each participant was tested individually in their home in western Thrace, Greece, under supervision by a Pomak-speaking local research assistant. The participants were seated in front of a laptop computer with a Latin keyboard with a comfortable reading distance. Each trial started with a fixation cross (+) in a white color on a dark gray background presented in the middle of the screen for 500 ms. Immediately following the cross, the sentence stimulus in each trial appeared centered to the middle of the screen as a whole, and words were masked with dashes. Each masked word was separated by a space, but any use of punctuation was not visible. Commencing from the first word in the left-hand side corner of the stimulus screen, participants were instructed to read the stimulus sentences a segment at a time by pressing the space bar on the keyboard at their own pace. At each space bar press, the next word in the segment appeared in a successive linear fashion from left to right (which is the normal reading direction in Pomak), and the previous word was masked with dashes again. Segments contained one or more than one word where necessary. The sentence stimulus was presented in Latin script, as shown above in Table 2, using Courier fonts, as this font type has equal width for each character. We used normalized units of 0.07 for font sizes in PsychoPy which roughly equated to 2.32 cm height per character on the 2240 × 1260 px presentation screen.

When the sentence stimulus ended in a given trial, the participants were given an end-of-trial acceptability task. They were instructed to respond whether or not the sentence they had read was acceptable by using the 's' and 'l' keys. The participants rated the entire sentence as either 'good' or 'bad' ('*Would you say that this sentence was 'good' in Pomak?*'). To facilitate the memorization of the keys, the 's' was marked with a happy face emoji and the 'l' key with an unhappy face emoji. The post-sentence end-of-trial task appeared after each trial. The trials were presented in a fully randomized order with the condition manipulations of the same sentence positioned in different blocks.

Participants responded to all 120 trials within a fully crossed design, that is, all participants saw all items. We opted for this design instead of a counterbalanced design—which is often used in psycholinguistic studies on well-studied languages—as, in minoritized non-standardized languages, individual variability in language profiles is wider. Therefore, developing counterbalanced lists with fixed participant characteristics is not necessarily warranted. Furthermore, in minoritized language contexts, it is not always possible to access large groups of individuals in order to gain adequate statistical power and, hence, fully crossed designs improve power as the total number of stimuli is not divided between participants. Three to four brief breaks were offered whenever participants needed to rest. The average session lasted 30 min. Participation was voluntary and participants did not receive any monetary compensation in agreement with local cultural norms. We followed the 'oral informed consent' procedure in compliance with ethics guidelines for protecting minoritized populations.

2.4. Analysis

We recorded per-region reading times (RTs), end-of-sentence acceptability ratings, and response latencies. Two kinds of data preprocessing actions were taken for the RTs. First, following Jegerski (2013), we applied an absolute cut-off by removing the RTs shorter than 200 ms in order to exclude key presses that may have occurred haphazardly. The removed observations were minimal (<0.75% in the critical region). In many psycholinguistic studies, an absolute cut-off of 4000 ms is also applied for L1 speakers (Jegerski 2013); however, we decided not to follow such a uniformed high cut-off as our participants were L1 speakers of Pomak but they bore a rather large variability in their reading experience in Pomak. Instead of an absolute cut-off for longer RTs, we removed RTs over 2.5 *SD* around the mean, which resulted in the removal of another 1.14% of the data. After the outlier removal, the remaining RTs ranged between around 200 ms and 3000 ms, which is well in accordance with Jegerski's recommended preprocessing norms on native speaker RTs. Second, prior to statistical analysis, the RTs were log-transformed to normalize the skewness of distribution. The end-of-trial response latencies were preprocessed by removing outliers that were larger than 2.5 *SD* around the mean, corresponding to 3.9% of the data.

The RTs and response latencies data were analyzed using the linear mixed-effects regression models with the *lme4* package (Bates et al. 2015) using R (R Development Core Team 2019). Acceptability ratings were collected as 1-0 binary data and were analyzed using logit transformation (Jaeger 2008) within general linear mixed-effects regression models. In our models, we included *Lifetime Status* (dead × alive) and *Tense Concord* (congruent × incongruent, i.e., between a past article and verbal tense/aspect) as fixed effects. The models included participants and items as random intercepts. We initially included fixed effects terms as random intercepts where appropriate, but they were then removed due to non-convergence issues. Fixed effects were sum-to-zero coded to avoid bias. A separate model was built per region of interest. Region length was added as a fixed/nested factor where applicable to be able to account for the different lengths of characters across regions. In certain regions, we removed region length from the models due to an equal number of characters across the stimuli (e.g., in Region 1, the word was always '*Moyet*' or '*Moyta*'). We first implemented the maximal random effect structure following Barr (2013) and then, when necessary, more simplified models were re-implemented by removing random effects to determine the best fitting model. In the linear mixed-effect models, *p*-values were obtained by utilizing Satterthwaite's approximation in the *lmerTest* package in R (Kuznetsova et al. 2017). Any post hoc pairwise comparisons were computed with the *emmeans* package in R using the Bonferroni correction (Lenth 2016). Statistical significance was set to $p < 0.05$.

3. Results

3.1. Acceptability Ratings

Mean acceptability ratings and response latencies are given in Table 4 and the outputs from the generalized mixed-effects regression model on the acceptance ratings are given in Table 5. These outputs showed significant fixed effects of Tense Concord and Lifetime Status and the interaction between the two. The interaction was driven by the null difference between the conditions *Status alive: congruent* (i.e., *past article/past perfect verb*) and *Status alive: incongruent* (i.e., *past article/future verb*) and lower acceptance ratings for *Status dead: incongruent* (i.e., *past article/future verb*) than for *Status dead: congruent* (i.e., *past article/past perfect verb*) (ß = 1.75, SE = 0.15, z = 11.13, $p < 0.0001$); see Figure 1 for the interaction plot. In sum, a living referent is acceptable with past perfect and future tense, independent from the past article's congruence with verbal tense/aspect. A dead referent is only acceptable with past perfect, not with future tense. We found no differences in the response latencies (see Table 6).

In the first two regions (R1 and R2), we found a fixed effect of Lifetime Status without an interaction (see Table 6). In both R1 and R2, sentences following a *dead status* were

associated with longer RTs. This effect was not modulated by Tense Concord (congruence between nominal and verbal tense) since the readers had not yet reached the verb.

Table 4. Per-region raw reading times in milliseconds, mean end-of-trial acceptance ratings in proportions, and response latencies in milliseconds. Standard deviations are in parentheses. Incongruent conditions are marked with a star (*).

Condition	*Region 1*	*Region 2*	*Region 3*	*Region 4*	*Region 5*	*Region 6*	*End of Trial Acceptance Ratings*	*End of Trial Response Latencies*
status dead; past article; past perfect verb	759.83 (470.68)	733.45 (480.43)	1036.85 (648.21)	714.71 (339.81)	821.16 (488.68)	770.25 (348.14)	0.67 (0.46)	1204.33 (1214.83)
status dead; past article; future verb*	749.21 (451.78)	728.07 (407.45)	1057.80 (662.60)	725.62 (404.82)	803.58 (424.84)	598.56 (356.03)	0.35 (0.47)	1148.33 (1058.20)
status alive; past article; past perfect verb	675.07 (386.33)	662.79 (370.31)	1187.79 (708.21)	751.28 (400.97)	788.94 (473.09)	675.29 (545.87)	0.85 (0.35)	1215.67 (1325.03)
status alive; past article; future verb*	697.46 (401.16)	699.05 (433.05)	1174.31 (725.33)	792.93 (437.87)	774.61 (424.23)	897.85 (514.98)	0.85 (0.35)	1220.51 (1327.56)

Table 5. Statistical outputs from mixed-effects models computed on acceptability ratings and response times. ß = model estimates based on logit-transformed probabilities in glmer and log-transformed response times in lmer, SE = standard error, *p*-values are calculated with the Satterthwaite approximation. Significant fixed effects are bolded.

	Acceptability			*Response Latencies*		
	ß (SE)	***Z***	***p***	**ß (SE)**	***t***	***p***
Intercept	1.22 (0.29)	4.14	<0.001	6.79 (0.08)	76.81	<0.001
Tense Concord	**−0.87 (0.12)**	**−7.11**	**<0.001**	−0.01 (0.02)	−0.02	0.98
Status	**2.08 (0.12)**	**16.29**	**<0.001**	−0.02 (0.02)	−0.75	0.45
Tense Concord × Status	**1.75 (0.24)**	**7.11**	**<0.001**	0.03 (0.05)	0.69	0.48

Code in R: sumcoding = -contr.sum(2)/2; model = glmer(Acc ~ Tense Concord × Status + (1 | participant) + (1 | number), family = binomial, data = qdata, control = glmerControl(optimizer = 'bobyqa'), contrast = list(Tense Concord = sumcoding, Status = sumcoding)).

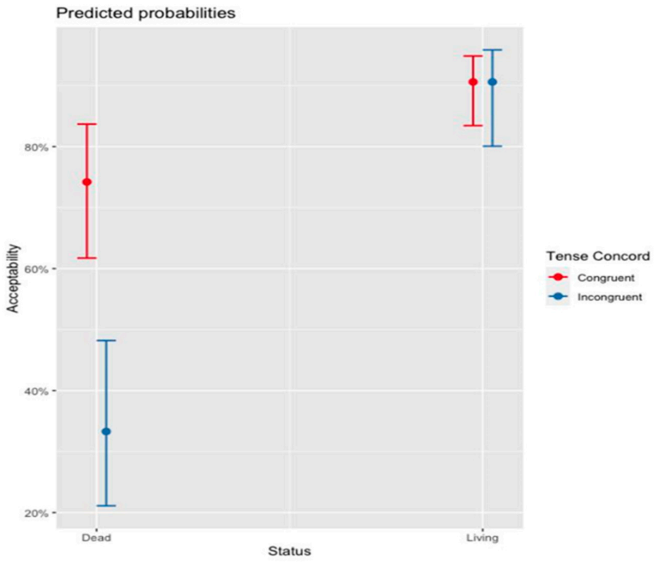

Figure 1. Interaction plot showing percent predicted probabilities for acceptability ratings (back transformed to percentages). Congruent conditions: *status dead/past article/past perfect verb* and *status alive/past article/past perfect verb*; incongruent conditions: *status dead/past article/future verb* and *status alive/past article/future verb*.

Table 6. Statistical outputs from mixed-effects models computed on per-region raw reading times. ß = model estimates based on log-transformed reading times, SE = standard error, *p*-values are calculated with the Satterthwaite approximation. Significant fixed effects are bolded.

	Region 1			***Region 2***			***Region 3***			***Region 4***			***Region 5***			***Region 6***		
	ß (SE)	***t***	***p***	**ß (SE)**	***t***	***p***	**ß (SE)**	***t***	***p***	**ß (SE)**	***t***	***p***	**ß (SE)**	***t***	***p***	**ß (SE)**	***t***	***p***
Intercept	**6.46 (0.06)**	**111.61**	**<0.001**	**6.44 (0.06)**	**108.74**	**<0.001**	**6.85 (0.08)**	**88.24**	**<0.001**	**6.52 (0.05)**	**128.52**	**<0.001**	**6.56 (0.06)**	**99.51**	**<0.001**	**6.42 (0.09)**	**58.18**	**<0.001**
Region Length	-	-	-	**0.04 (0.01)**	**3.36**	**0.001**	**0.12 (0.01)**	**8.71**	**<0.001**	**0.08 (0.01)**	**7.76**	**<0.001**	**0.08 (0.01)**	**5.33**	**<0.001**	-	-	-
Tense Concord	0.01 (0.01)	0.66	0.512	0.03 (0.02)	1.60	0.110	**0.04 (0.02)**	**2.25**	**0.024**	0.02 (0.01)	1.50	0.135	−0.01 (0.02)	−0.59	0.553	−0.09 (0.07)	−1.36	0.175
Status	**−0.07 (0.01)**	**−5.30**	**<0.001**	**−0.07 (0.01)**	**−4.26**	**<0.001**	**0.14 (0.02)**	**7.14**	**<0.001**	**0.06 (0.01)**	**4.42**	**<0.001**	**−0.04 (0.02)**	**−2.36**	**0.019**	0.07 (0.06)	1.26	0.211
Tense Concord* × *Status	0.04 (0.03)	1.43	0.154	0.02 (0.03)	0.49	0.623	−0.02 (0.04)	−0.65	0.514	0.05 (0.03)	1.63	0.104	0.01 (0.03)	0.39	0.696	**0.52 (0.12)**	**4.53**	**<0.001**

3.2. Reading Times

Table 4 and Figure 2 illustrate the per-region raw RTs and the statistical outputs for the per-region RTs analysis are given in Table 6.

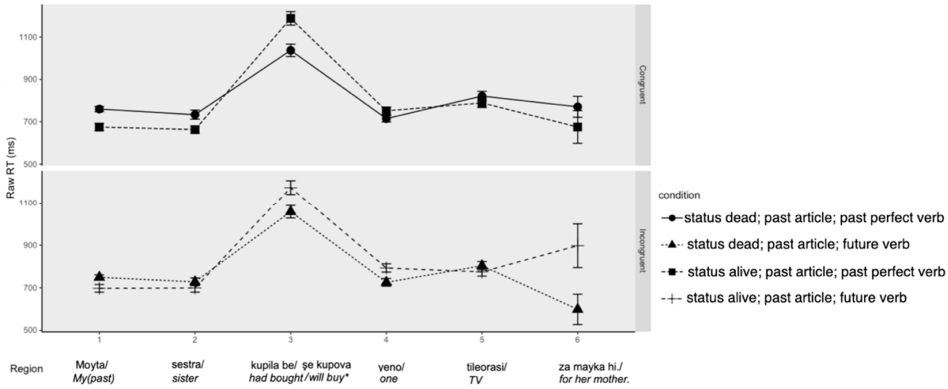

Figure 2. Mean raw RTs across critical regions of interest. Error bars show standard error around the mean.

At the verb (R3), we found a fixed effect of Tense Concord and Lifetime Status without an interaction between the two. The fixed effect of Tense Concord indicates that *past article/future verb* was associated with longer RTs. In this region, the direction of the Lifetime Status effect was reversed; participants read sentences following an *alive status* more slowly than those following a *dead status* (see Figure 3). This lifetime effect was sustained in R4.

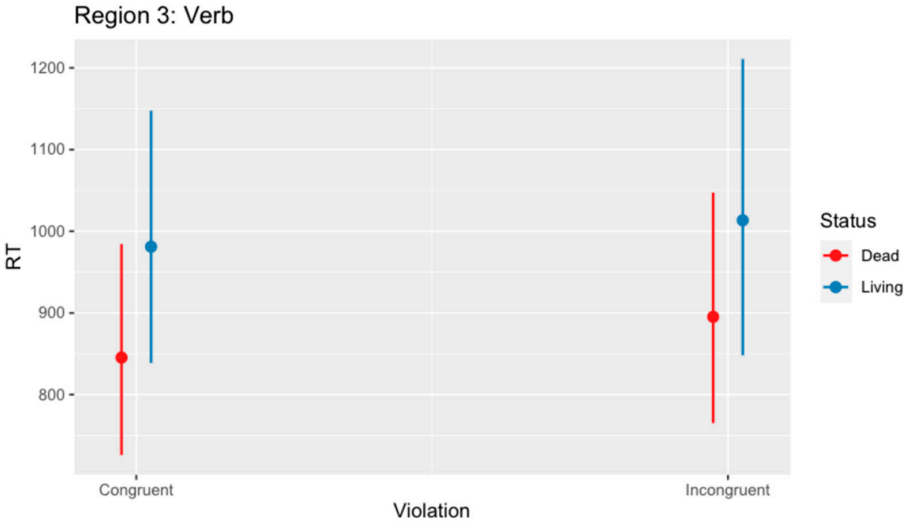

Figure 3. Predicted mean RTs in the verb region (R3), back-transformed into milliseconds.

Finally, a significant interaction for Tense Concord × Status was found in the sentence final region (R6). In the incongruent condition (*past article/future verb*), sentences with an *alive status* were read more slowly than those with a *dead status* (ß = −0.33, SE = 0.09, $t = -3.54$, $p = 0.003$). Under the congruent conditions (*past article/past verb*), in the sentence final region R6, sentences with a *dead status* were read more slowly than those with an *alive status* (ß = 0.18, SE = 0.0, $t = 2.83$, $p = 0.02$).

4. Discussion

In this study, we explored for the first time how Pomak readers integrate contextual information about the lifetime status of a kin referent (dead or alive) with past nominal tense and how they rate these sentences. We note that, even though Pomak is a minoritized

language and its speakers have variable experience with reading it, the participants successfully completed the reading task. Table 7 summarizes our predictions and indicates whether they were borne out.

Table 7. Predictions per task and condition following the results.

	a. Status Dead; Past Article; Past Perfect Verb	*b. Status Dead; Past Article; Future Verb*	*c. Status Alive; Past Article; Past Perfect Verb*	*d. Status Alive; Past Article; Future Verb*
Acceptability ratings	✓ high	✓ low	✗ low	✗ low
Reading times at post-noun phrase region (R3)	✓ shorter	✓ shorter	✓ longer	✓ longer
Reading times sentence finally (R6)	✓ shorter	✓ shorter	✓ longer	✓ longer

Based on Adamou and Haendler (2020), we expected that the *t*-suffix would be associated to realis past interpretations and, in combination with kinship terms, we expected a lifetime effect to arise. Congruence between past nominal tense and past verbal tense was also predicted to be preferred over incongruence. More specifically, for the acceptability ratings, we predicted lower ratings for both the conditions alive status/past articles (c and d in Table 7) but also expected to find lower ratings for both the conditions past article/future verb (b and d in Table 7). We found that the participants rated sentences based on the lifetime status (dead or alive) and its agreement with verbal rather than nominal tense, suggesting that nominal tense lifetime effects are less salient in explicit linguistic judgments. Differences in ratings based on differences in the severity and overtness of the violations are also noted in Palleschi et al. (2020) for English; their participants detected the overt and severe violation of an utterance with a dead referent and a future verb but not the more subtle and less severe violation of a dead referent and a present perfect verb. A significant interaction in our acceptability ratings analysis was driven by the reduced ratings in the dead status/future verb condition (b in Table 7) in comparison to all the other conditions. That is, the participants found a future verb in a context with a dead referent less acceptable than in a context with a living one and less acceptable than a past verb with either a dead or an alive status. We believe that, in the linguistic judgments, the alive status of the referent established in the context may have overridden the subtler lifetime effect of the past article.

For the reading times, we hypothesized that the lifetime effect triggered by Pomak past nominal tense should lead to longer reading times in the infelicitous conditions *alive status/past article* (c and d) as compared to the felicitous *dead status/past article* (a and b). In the absence of previous processing studies of nominal tense and its lifetime effect, we relied on studies of the lifetime effect in languages with verbs for more detailed predictions. Drawing a parallel with the reading experiment in Chen and Husband (2018) that found lifetime-related costs in the post-critical verb region and sentence finally, we tentatively predicted costs for living referents in the post-nominal tense regions and general costs sentence finally. In agreement with our predictions, our results reveal reading disruptions as measured by slow RTs for the two conditions *alive status* (c and d) at the regions immediately following the critical noun phrase. We interpret this as an indication of the infelicity of these sentences due to the lifetime effect triggered by past nominal tense.

In addition, at the beginning of the critical sentence, Pomak readers slightly slowed down in their RTs during the first two pre-verbal noun phrase segments (R1 and R2) for dead as compared to living referents. This is an intriguing finding as at this sentence's initial stage the manipulation of nominal tense was not yet seen (readers discovered the kin referent in R2). We believe that this sentence initial reading disruption for the dead referents occurred as a result of forms of carryover effects from the pre-critical contextual sentence. These sentence initial critical noun phrases (e.g., *my sister*) were linked to the previous discourse in which the referents were introduced for the first time (e.g., *I have a sister*). In the two conditions with a dead status, the contextual sentences contained information that the referent is deceased (i.e., *I have a sister who is dead*). One possibility is the emotional content of the contextual

sentence involving the death of kin, which was also marked for first-person, suggesting the kin is related to the speaker, has elevated reading times in the noun phrase region in our experiment. Indeed, emotional valence influencing sentence processing is reported in behavioral data (Jiménez-Ortega et al. 2012). Moreover, in line with Palleschi et al. (2020), we found shorter RTs in the sentence final region for the dead status/past article/future tense sentences (condition b) in comparison to the alive status/past article/future tense sentences (condition d). This is a common effect in reading experiments in general as participants tend to read post-critical regions in a given sentence stimulus with obvious violations more quickly, leading to a form of facilitation (Jegerski 2013).

Our design did not allow observing sentence final wrap-up effects related to the lifetime effects of nominal tense, presumably because of the manipulation of verbal tense. As Palleschi et al. (2020) suggests, this may result from the two different types of conflict that comprehenders are exposed to, that is, those arising from the two tenses (Tense Concord) and those arising from the knowledge provided in the contextual sentence (Lifetime Status). In the future, an experiment without the manipulation of verbal tense could help shed light on the sentence final processing effects of nominal tense. Taken together, our results suggest that past nominal tense with kinship terms triggers a lifetime effect that is apparent during online processing. The lifetime effect is either undetected or judged as less severe in explicit acceptability ratings due to the presence of the more overt and severe violations of the verbal tense.

Although this study provided the first experimental evidence that a lifetime effect is triggered by nominal tense in Pomak, this study was not without any limitations. First, we avoided directly manipulating nominal tense. Specifically, the article used in the critical noun phrase was consistently in realis past and did not contrast with a future/irrealis/habitual article. This is because the future/irrealis/habitual suffix can become ambiguous with a distal reading. An anonymous reviewer also notes that when the person–referent is alive and the verb is in future tense, the past t-suffix on the nominal article in sentences like those in our condition *d* (status alive + past article + future verb) might be interpreted as distal but not as temporally past. This interpretation aligns with the acceptability response data, which showed no differences between the condition *c* (status alive + past article + past perfect verb) and condition *d* (status alive + past article + future verb). This suggests the Pomak readers found the potential infelicity between a past article and a future verb to be quite acceptable. However, the per-region reading times data complicate this picture. In both the conditions *c* and *d*, where the person–referent is living, the Pomak readers showed increased reading times immediately following the main verb. Additionally, in condition *d*, the Pomak readers exhibited elevated reading times at the sentence final region, implying that they took longer to integrate sentence meaning as compared to the condition *c*. We interpreted these findings in line with the lifetime effects, as the past article in such a context was unsettling. If the possessive articles were interpreted solely as distal and not as temporally past, such reading disruptions would not have been expected. As noted above, we used kinship terms such as 'sister' or 'grandmother', where a natural ending of the relationship while the kin are still alive is not plausible (in contrast to terms like 'husband' or 'girlfriend', for whom a past article might be interpreted as an ex-husband who is not necessarily dead). We believe that this choice of kins disambiguated the interpretation of the article towards a past reading rather than a distal one. However, without overt judgments of the participants' interpretations of one of the possible readings, we still cannot rule out whether the Pomak speakers had to resolve the ambiguities between distal and temporally past interpretations during their per-region reading. In a future study, we intend to adopt a distinct methodology to modulate nominal tense, aiming to limit the interpretations of the future/irrealis/habitual suffix, akin to the technique employed by Adamou and Haendler (2020) who explicitly asked participants whether a noun phrase was past or future. Second, we believe that in the sentences with an *alive status*, especially when there was an incongruence between the *past article* and *future verb*, sentence final effects should be

viewed with care. This is due to the fact that our sentence materials were relatively short, with few segments following the critical manipulations, and, hence, these sentence final effects might have been blended with certain effects resulting from the readers' recovery from seeing a grammatical violation. In other words, in both the conditions with an *alive status*, there is a form of logical incongruence, either because the kin referent presented in the context as 'alive' is then interpreted as 'dead' because of the lifetime effect of past nominal tense and/or because this dead kin is presented as performing an action in the future. This interpretation is consistent with our data because, in this sentence final region, we found an interaction effect between Violation and Lifetime Status, suggesting that the *alive status* with a *past article/future verb* incongruence was the condition that elicited by far the longest RTs as compared to any other condition. We conclude that integrating sentence meaning was the most effortful in this condition, where a living referent that was later understood to be dead (through past nominal tense) would commit an action in the future, in comparison to a living referent, later understood to be dead (through past nominal tense), who has done an action in the past. In the latter case, the lifetime effects of nominal tense and its combination with the past perfect of the verb encourage readers to override the contextual logical incongruence that the referent was alive. To tease these different effects apart, an additional study might explore this issue with a design where nominal tense is placed post-verbally. Despite these limitations, the current exploratory study lends support to previous reports of lifetime effects in other languages with nominal tense and highlights an additional similarity between nominal and verbal tense.

In conclusion, our study provides novel insights into the processing of lifetime effects in Pomak, a language with nominal tense. We found significant effects of lifetime status in the immediate verbal and post-verbal regions as measured by more increased reading times for alive than for dead status. Further, at the sentence final region, sentences with incongruent past article/future verb conditions were read more slowly than those with a dead status. In other words, a past/dead sister doing an action in the future evoked post-interpretive difficulty in integrating sentence meaning. These findings demonstrate that past nominal tense with kinship terms triggers significant lifetime effects during online reading, particularly when the referent's lifetime status is incongruent with verbal tense.

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Institutional Review Board Statement: This study was conducted in accordance with the Declaration of Helsinki and approved by the Comité d'Éthique de la Recherche (CER), Université Côte d'Azur (2023-040, approved 20 August 2023).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are openly available on OSF, https://osf.io/h6gd7/ accessed on 13 October 2024.

Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

1, 2, 3 first, second, third person; ABSN absential; ADRE addressee; ART article; DAT dative; DEF definite; EVID evidential; F feminine; FUT future; IRR irrealis; IMP imperative; M masculine; N neuter; N.INCP incorporated noun; NP proper noun; OBL oblique; PL plural; PRO pronoun; PST past; RDP reduplication; REL relative; SBJ subject; SG singular; SPKR speaker.

Notes

[1] On a general note, we acknowledge that the concept of nominal tense is subject to debate within linguistic circles, as exemplified by the arguments presented in Bertinetto (2020); see also Tonhauser (2007) for further arguments. The scope of our current study does not extend to a typological analysis to determine whether a language exhibits a grammatically 'true' nominal tense or utilizes nominal markers that, while not fully grammaticalized, convey past references through pragmatic-level information. In either scenario, an opposition between a past and a non-past concept is obtained, which serves as the basis for our experimental design. For the sake of clarity, we will simply refer to this as 'nominal tense'.

[2] Please note that neither Greek nor Turkish expresses temporal distinctions in nominal definite articles as Pomak does; in fact, Turkish does not even have definite articles at all.

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