

Secondary predication in Irish and the syntax-prosody interface

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Abstract. Cross-linguistically, secondary predicates may be distinguished from event-modifiers (e.g. adverbs or converbs) and individual-modifiers (e.g. attributive adjectives, participles, or prepositional phrases) via the presence or absence of prosodic processes and phonetic cues. This paper examines the prosodic behavior of secondary predicates in Modern Irish, which can form bare adjectival depictive and resultative secondary predicates. We show that Mod. Irish bare AP secondary predicates are distinguished from surface distributionally equivalent attributive modifiers through the morphophonological system of initial mutation and cues such as phrase-final lengthening and pauses. These facts support an analysis of secondary predicates as extraposition structures that project to a ϕ_{MAX}/L -boundary, mapping to complex syntactico-semantic representations. Evidence from Italian consonant gemination (*raddoppiamento sintattico*) and Georgian boundary tones are likewise discussed under the proposed analysis.

Keywords. syntax-prosody interface; secondary predication; phonetic cues; initial consonant mutation; Irish

1. Introduction. Secondary predicates are nonverbal expressions that convey information about an argument in the primary predicate, but which are syntactically distinct from the argument with which they are semantically bound (Levin & Hovav 1994; Kratzer 2005; Pylkkänen 2008). That secondary predicates compose discrete syntactic constituents which exclude the material in the primary predicate is reflected in their prosodic behavior cross-linguistically (Himmelman & Schultze-Berndt 2005; Guzzo & Goad 2017).

In Modern Irish (Mod. Irish), the idiosyncrasies of secondary predicate structures are particularly salient. The secondary predicate in (1c) is marked by a pause, final lengthening of the preceding word, and other cues indicative of prosodic boundaries. This indicates that the secondary predicate adjective is structurally external to the phrase which contains its co-indexed antecedent noun. Attributive (1a) and adverbial modifiers (1b) are not prosodically marked, reflecting their syntactic and prosodic structural proximity to the phrases which host their modificand.

(1) a. Attributive adjective (Ó Dubhdha 1915, *Ar Lorg an t-Seanchaidhe*)

bhí gasur óg **cosnochtuighthe** a' buachailleacht bó...
 be.PST boy young barefoot at herding cow.GEN.PL.
 '[A [young]_{AP} [barefooted]_{AP} boy]_{DP} was herding cattle...'

b. Adverbial modifier (Mhic Conchoille 1938-9, *The Schools' Collection*, Vol. 357)

maidin áirighthe tháinig sí **go coslomochna...**
 morning certain come.PST 3SG.F ADV barefoot
 'One morning, she [came [barefooted(ly)]_{ADV}]_{VP}.'

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- c. Depictive adjective (Ó Maolchatha n.d., *Focail Fholaithe*, s.v. *cosnochtaithe*)
 theigeadh an chuid ba mhó de sna scoláirí
 come.PHAB.AUT DET part COP.PST big.SUPERL of DET.PL scholar.PL
COSNOCHTAITHE go dtí an scoil fad ó
 barefoot to DET school long ago
 ‘[Most of the students]_i used to come barefoot_i to school long ago.’
 *‘Most of the barefooted students used to come to school long ago.’

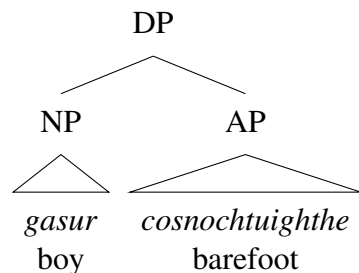
This paper provides phonetic and morphophonological evidence for a prosodic structural difference between secondary predicate adjectives and attributive modifiers in Mod. Irish, as well as in two additional languages (Italian, Georgian). Our specific analysis suggests that secondary predicates compose extraposed prosodic structures which can project markedly high on the prosodic hierarchy of a given language. The data from phonetic minimal pair analysis corroborates the complexity of secondary predicate structures established by the syntax and semantics, and therefore bears on interactions between syntax and Phonological Form (PF). This paper is organized as follows: §2 provides an overview of secondary predicate structures and examines their specific properties in Irish (§2.1). §3 shows that bare AP secondary predicates are prosodically marked in Irish (§3.1) and across two additional case studies (§3.2-3), and proposes an analysis that accounts for the relevant prosodic constituency. §4 concludes.

2. The structural composition of secondary predication. Traditionally, work on secondary predication focuses on two major semantic types: depictives and resultatives (Irimia 2005). Depictive secondary predicates (2a) express a state achieved *at the time when* the action indicated by the main event occurs. Resultatives (2b) express a state achieved *as a result of* the action indicated by the main event (Kratzer 2005).

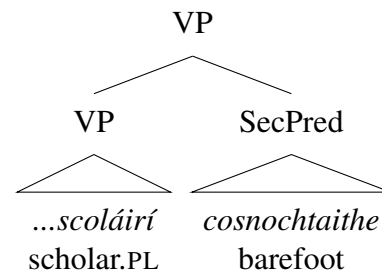
- (2) a. John ate the meat_i **RAW**_i.
 b. John hammered the nail_i **FLAT**_i.

While attributive modifiers are structurally internal to the phrase which contains their head noun (3), depictive and resultative secondary predication structures are crucially *external* to the immediate phrase which contains their antecedent noun (4). This follows from (morpho)syntactic and semantic facts born out typologically.

(3) Syntax of attributive (1a).



(4) Syntax of depictive (1c).



Case and agreement evidence establishes the existence of functional projections within the sec-

ondary predicate structure labelled SecPred for convenience in (4). These structures must be large enough to host e.g. an agreement probe in some languages (Georgian), and distinct case morphology in others (Finnish, Hungarian) (Pykkänen 2008; Irimia 2012).¹ The SecPred projection in (4) likewise encodes the complex semantic relationship between the secondary predicate (*cos-nochtaithe* ‘barefoot’), the relevant participant (*scoláirí* ‘students’), and the event with which the secondary predicate state co-occurs.

At the level of syntax and semantics, then, the complexity of secondary predicate structures can be established. The literature in this area is extensive, and includes analyses of secondary predicate constructions as small clauses, complex predicate phrases, a.o. (Levin & Hovav 1994; Kratzer 2005; Ramchand 2008). The precise categorization of these structures is not conclusively evinced from the syntactico-semantic information here provided, but it is requisite that these structures be distinct from those of attributive modifiers in order to account for the data.

2.1. MOD. IRISH SECONDARY PREDICATE STRUCTURES. Mod. Irish typically expresses depictive secondary predicate semantics via small clause structures, which lack an overt finite verb. Following Chung & McCloskey (1987), small clauses relevant to the present discussion minimally contain an accusative-marked pronoun followed by an XP, where X is adjectival.² They are most commonly formed with a coordinating conjunction *agus* ‘and’ which marks the left edge of the small clause (5a), but may also occur without the overt conjunction (5b).

- (5) a. (Ó Súilleabháin 1933, *Fiche Bliain ag Fás*)
 bhí sé ag imeacht leis agus é FLIUCH
 be.PST 3SG.M PROG leave.VN with.3SG.M and 3SG.M.ACC wet
 ‘He_i was taking off wet_i...’
- b. (Ó Riain 2010, *The Irish Times*)
 frith-eadh na coirp tar éis trí lá, iad REOI-TE
 find-AUT.PST DET.PL body.PL after three day 3PL.ACC freeze-PST.PTCP
STROMP-THA
 stiff-PST.PTCP
 ‘The bodies_i were found after three days [frozen stiff]_i.’

Additionally, Mod. Irish can form depictive (6) and resultative (7) secondary predicates³ which contain only an adjective and no other overt functional or lexical material. These constructions

¹ We assume that the Finnish ESSIVE and Finnish and Hungarian TRANSLATIVE cases on secondary predicates are checked/valued by functional heads within the secondary predicate structure (Irimia 2012:127), and that number agreement on Georgian secondary predicate adjectives suggests the presence of an additional probe in the syntax. Similar evidence is attested in Early Irish corpora.

² This is unsurprising given the frequent use of resumptive pronouns in Irish, see McCloskey (1990) for discussion.

³ Cross-linguistic evidence suggests that the bipartite distinction between depictives and resultatives is not sufficient to capture the observed data (Himmelmann & Schultze-Berndt 2005). The existence of categories such as ‘circumstantials’ (cf. Irimia 2005), or secondary predicates which *describe* their antecedent (like a depictive) but which may relate it to the main event *causally* (like a resultative), demonstrate the insufficiency of this binary distinction. That depictives and resultatives do not constitute discrete categories may be the case for Irish, but this is outside the scope of the present study. For present purposes, we categorize Mod. Irish secondary predicates as depictives and resultatives and include only those examples which we believe do not give rise to ambiguity.

resemble the bare adjectival secondary predicates in English (2), but have a restricted distribution and limited productivity in Irish.⁴

(6) Depictive adjectives

- a. (Ó Dónaill 1977, *Foclóir Gaeilge-Béarla*, s.v. *dearg*)
d'ól sé **DEARG** é
drink.PST 3SG.M red 3SG.M.ACC
‘He drank it_i raw_i.’
- b. (Ó Cróinín & Ó Cróinín (eds.) 1967-68, *Béaloideas*, Vol. 35/36)
is annamh riamh a tháinig sé **FOLAMH** ‘na dhia’ sin
COP.PRS rarely ever REL come.PST 3SG.M empty after DEM
‘He_i rarely came empty-handed_i after that.’
- c. (Ó Domhnalláin & Ó Raghallaigh 1923, *Bruth-fá-thír*)
shroich an bheirt talamh tirim **SLÁN SÁBHÁIL-TE...**
reach.PST DET two.people land dry safe save-PST.PTCP
‘The two of them_i reached dry land [safe and sound]_i.’

(7) Resultative adjectives

- a. (Ó Dónaill 1977, *Foclóir Gaeilge-Béarla*, s.v. *abhainn*)
chuir-feadh sé thar an abhainn **TIRIM** thú
put-COND 3SG.M across DET river dry 2SG.ACC
‘He is free with his promises (lit. he would put you_i dry_i across the river).’
- b. (Ó Muirthile 2014, *An Colm Bán*)
bhí sé á scuabadh **GLAN** faoi luas...
be.PST 3SG.M PROG.POSS.3SG.M brush.VN clean under speed
‘He was hurriedly sweeping it_i clean_i...’
- c. (de Bhaldraithe 1959, *English-Irish Dictionary*, s.v. *dead*)
leag sé **MÍN MARBH** é
knock.down.PST 3SG.M smooth dead 3SG.M.ACC
‘He killed him_i [stone dead]_i.’

The relationship between the periphrastic secondary predicate constructions in (5a) and (5b) and the bare adjectival secondary predicate constructions in (6) and (7) is crucial. Under one analysis, (6) and (7) are the same structures with covert material at the left-edge which is pronounced in (5a) and (5b). Thus bare adjectival secondary predicate structures in Mod. Irish can be analyzed as small clause structures within which both the secondary predicate adjective and its antecedent

⁴The most frequently occurring bare adjectival secondary predicates are idiomatic and non-compositional. Broader compositional usage of these constructions likely reflects influence from English (so-called ‘*Béarlachas*’); many examples are not accepted in traditional Irish-speaking Gaeltacht regions. Nevertheless, evidence from Early Irish suggests that bare adjectival secondary predicate structures were once more widespread than the current distribution in Mod. Irish. This is the subject of forthcoming research.

noun originate. Covertly, this small clause will contain, at minimum, a DEP operator which ensures temporal overlap between the event expressed by the verb and the state of the antecedent expressed by the overt AP, or a RES operator which ensures that the event expressed by the verb is identical to the event of causing the result state (Kratzer 2005; Pytkänen 2008; Irimia 2012; Milway 2019).

In sum, small clause structures with functional material at the left-edge are commonly used to express secondary predicate semantics in Mod. Irish, but reduced bare adjectival constructions are also found. The latter is of particular interest to the present study, as they form minimal pairs with attributive adjectival structures. This is explored in §3 below.

3. The prosodic character of secondary predication. Cross-linguistically, secondary predicates have a distinct prosodic character (Himmelman & Schultze-Berndt 2005; Guzzo & Goad 2017; Caso 2024). The marking of prosodic constituency in a given language, which may include boundary cues in the preceding word, pitch/tonal cues, sandhi effects, a.o., encodes the syntactic structural distinctiveness of secondary predicate adjectives. A possible means of modelling this correspondence between syntax and prosody is **MATCH theory**: the default relationship between syntactic and prosodic structures is one of identity and mismatches between the two arise as a result of violable OT constraints (Selkirk 1986, 2011; Elfner 2012; a.o.). Preferentially, syntactic constituents map to prosodic constituents of the same level: morphosyntactic words (X^0) map to prosodic words (ω), syntactic phrases (XP) map to prosodic phrases (ϕ), and clauses (CP/TP) map to intonation phrases (ι).

The data below from Irish (§3.1), Italian (§3.2), and Georgian (§3.3) demonstrate various prosodic behaviors in minimal pairings of secondary predicates and attributive structures in bare adjectival configurations.⁵ The following pilot study includes 1-3 participants in the target languages, testing 2 conditions (attributive and secondary predicate) and approximately 10 tokens per condition. Prosodic diagnostics include: lengthening of phrase-final vowels, pitch/tonal cues, pauses, and sandhi-like phenomena.

3.1. EVIDENCE FROM MOD. IRISH. Mod. Irish provides evidence for a distinct prosodic treatment of secondary predicates through its morphophonological system of initial mutation, a grammaticalized set of *phonological* changes to initial segments that are *morphosyntactically* conditioned (Carnie 1991).⁶ Of the set of possible mutations in Mod. Irish (lenition, nasalization, *t*-prothesis, *h*-prothesis), only lenition⁷ is relevant to the present discussion of NP-AP pairings

⁵ In head-initial languages like Irish, bare adjectival secondary predicates form minimal pairs with attributive modification structures given their surface-distributional equivalence. In Georgian, the surface distribution of attributive adjectives and secondary predicate adjectives is not identical: secondary predicates follow their referent in unmarked declarative contexts. While AP-NP order where the AP is a secondary predicate is felicitous in Georgian, it is information structurally distinct and would therefore introduce an additional confound. As such, only NP-AP secondary predicate configurations were tested in Georgian.

⁶ Following established terminology, initial mutations are applied to followings segments by “triggers” which are conventionally marked with a superscript letter at the end of the word preceding the mutation, i.e. X^L marks a word X which triggers lenition, X^N one which triggers nasalization, etc. (Ball & Müller 2012).

⁷ Phonetically, and ignoring secondary articulation for illustrative purposes, grammatical lenition involves spirantization (e.g. /p, b, m/ → [f, v, v]), debuccalization (e.g. /s, t/ → [h, h]) or elision (/f/ → Ø), depending on the consonant undergoing mutation. In the case of /d/, lenition also involves a change in place of articulation, e.g. /d/ → [ɣ]. The phonological secondary articulations, i.e. palatalization/*caoile* ‘slender’ quality (transcribed [X^J]) and velarization/*leithne* ‘broad’ quality (transcribed [X^V]), are elsewhere represented in our transcriptions following the system of Bennett et al. (2018) in order to maximally capture the binary distinction between consonant sets. Grammatical

insofar as nouns are restricted to triggering lenition synchronically. In the data below, the presence or absence of lenition following the NP trigger corresponds to the interpretation of the AP or APs⁸ as either an attributive (8a-10a) or a secondary predicate (8b-10b). While attributive structures demonstrate the application of lenition in conditioned environments, *secondary predication structures do not allow it*.⁹

- (8) a. Attributive adjective (Mac Gabhann 1962, *Comhar* 21(4))
 ...nach mair-eann an Ghaeilge^L **bheo** [vʲo:] in aigne na ndalta-í...
 NEG.SUBR live-PRS DET Irish alive in mind DET.GEN.PL student-PL
 ‘...that living Irish does not survive in students’ minds...’
- b. Depictive adjective (Mac Congháil 2014, *An tUltach*, 91(2))
 an mair-fidh an Ghaeilge^L **BEO** [bʲo:]?
 Q live-FUT DET Irish alive
 ‘Will Irish_i survive (lit. live alive_i)?’
- (9) a. Doublet attributive adjectives (Ó Cróinín 2022, *Nós*)
 is mór an tábhacht leaba^L **the theolaí** [he hʲo:lʲi:] a bheith ag duine
 COP.PRS big DET importance bed hot cozy INF be.VN at person
 ‘It is very important to have a cozy bed.’
- b. Doublet depictive adjectives (Mac Uistín 2010, *Cad a tharla don Eolaí Óg?*)
 ... bhí Alocs in-a luí sa leaba^L **TE TEOLAÍ** [tʲe tʲo:lʲi:]...
 be.PST Alocs in-3SG.M.POSS lie.VN in.DET bed hot cozy
 ‘...Alocs_i was asleep in bed, [all snug]_i...’
- (10) Doublet depictive adjectives (Ó Broin 1923, *Árus na nGabhadh agus Sgéalta Eile*)
 tháinig an oíche^L **FUAR FLIUCH** [fʲuærʲ fʲlʲoxʲ]...
 come.PST DET night cold wet
 a. *‘The cold wet night came...’
 b. ‘The night_i came [cold and wet]_i...’

The examples below and their corresponding waveforms, spectrograms, and pitch tracks, demonstrate the surface forms of lenited consonants in attributive constructions (11a-13a) and the absence of lenited consonants in secondary predicates (11b-13b) despite surface (but not structural) adjacency to lenition triggers marked with ^L. Phonetic cues such as pauses, pitch resetting, and

lenition of an initial consonant is represented in Irish orthography through the addition of an *h* following the mutated consonant (e.g. <ph> [f], <bh> [v], etc.).

⁸ Largely idiomatized pairings of adjectives which form a discrete prosodic and syntactic constituent we term “doublet” adjectives. They are distinct from compound adjectives, as they lack compound lenition, and are both subject to the mutation triggered by their referent. The individual elements of the doublet are often semantically proximate, as in (5b), but in combination lend emphasis to the predicate.

⁹ The relationship between prosody and lenition is not 1:1; the structural groupings observed here do not necessarily *cause* the application of lenition, but lenition is still informative.

phrase-final lengthening also distinguish secondary predicate adjectives from attributive adjectives in the data.

- (11) a. Attributive adjective
 rug sé ar na héisc^L **bheo** [v^jo:]
 catch.PST 3SG.M on DET.PL fish.PL alive
 ‘He caught the live fish.’
- b. Depictive adjective
 rug sé ar na héisc^L **BEO** [b^jo:]
 catch.PST 3SG.M on DET.PL fish.PL alive
 ‘He caught the fish_i alive_i.’

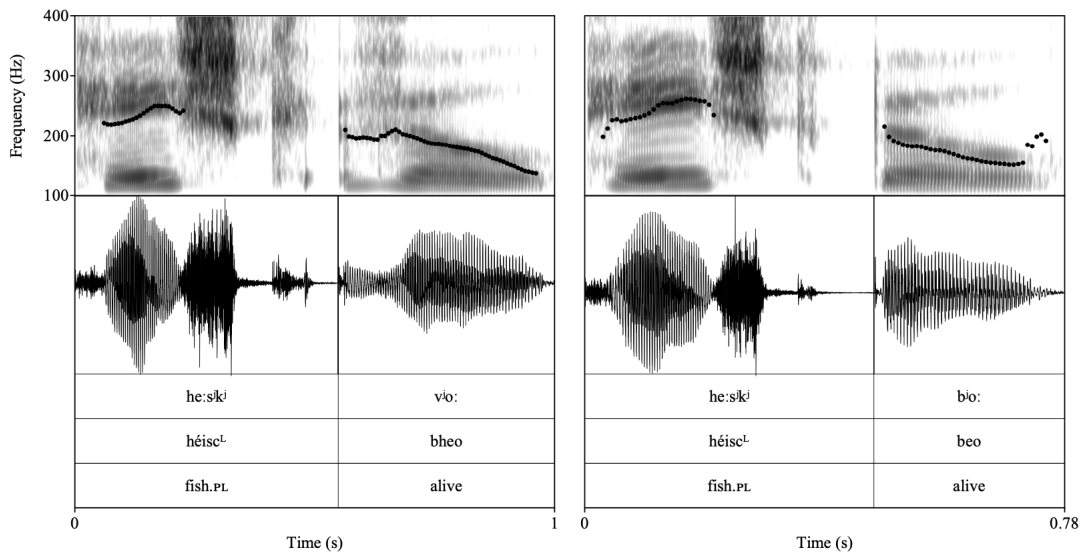


Figure 1. Extracts from attributive (11a) (left) and depictive (11b) (right).

In Figure 1 (left), the adjective *beo* /b^jo:/ [v^jo:] ‘alive’ is lenited following the masculine nominative plural lenition trigger *éisc* ‘fish’:¹⁰ the target is a palatalized voiced bilabial fricative [v^j]. In Figure 1 (right), the adjective *beo* /b^jo:/ [b^jo:] has not undergone lenition: the target is a palatalized voiced bilabial stop [b^j]. The noise time interval, low average frequency/amplitude, and voicing bar in the bilabial fricative in Figure 1 (left) contrasts with the short noise time interval and lack of voicing bar/frication in the bilabial stop in Figure 1 (right). The attributive adjectival construction in Figure 1 (left) is not accompanied by either a pause nor a reset in pitch, but the secondary predicate example in Figure 1 (right) follows a notable pause.¹¹

Final lengthening of the vowel in *éisc* ‘fish’ in Figure 1 (right) also provides evidence for prosodic groupings insofar as final lengthening is reflective of phonological phrase boundaries. The raw duration of the final vowel of the noun preceding the secondary predicate adjective (right)

¹⁰ The form *éisc* in the example is realized as /he:sʲkʲ/ [he:ʃc] due to the *h*-prothesis triggered by the NOM.PL definite article *na*. The form *éisc* triggers lenition as it forms a so-called “weak plural” of the Irish 1ST declension noun class.

¹¹ Pitch resets are also common throughout our data, but such a reset is not salient in this particular example.

is 12.7% longer than the final vowel of the noun preceding the attributive adjective (left). Correcting for speech rate and considering the duration of the final vowel in the noun preceding the target adjective against the determiner phrase (DP), the duration of the final vowel preceding the secondary predicate adjective (right) is 9% longer than the final vowel in the noun preceding the attributive adjective (left). The odds ratio is 1.36. The same pattern holds for (12).¹²

- (12) a. Attributive adjective
 scaoil-eadh an bhó^L **shaor** [hi:r^v]
 release-PST.AUT DET cow free
 ‘The free cow was released.’
- b. Resultative adjective
 scaoil-eadh an bhó^L **SAOR** [s^vi:r^v]
 release-PST.AUT DET cow free
 ‘The cow_i was released free_i (lit. released free).’

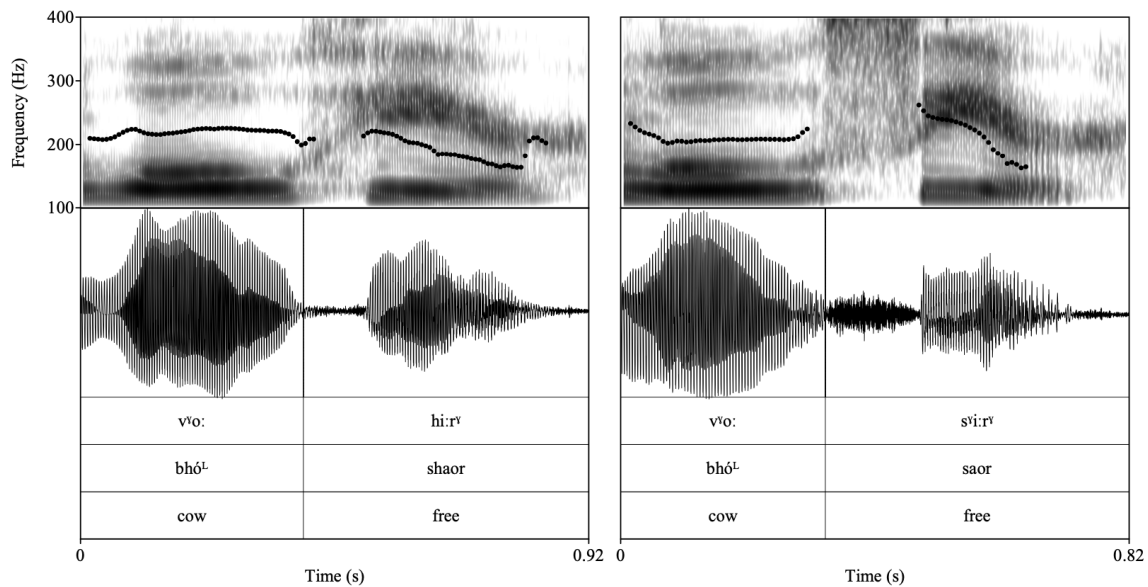


Figure 2. Extracts from attributive (12a) (left) and resultative (12b) (right).

In Figure 2 (left), the adjective *saor* ‘free’, the underlying representation of which is /s^vi:r^v/, undergoes lenition yielding [hi:r^v]. The initial segment of the adjective is realized as the voiceless glottal fricative [h]. Note the gradual formant transition from the rounded back mid vowel [o:] with low-F2 and greater proximity between F1 and F2 in the head noun *bhó* ‘cow’, to the high front vowel [i:] with higher F2 and greater distance between F1 and F2 in *saor* ‘free’. In Figure 2 (left), the secondary predicate adjective *saor* /s^vi:r^v/ [s^vi:r^v] has not undergone lenition. The target

¹² Importantly, (12) is a resultative bare adjectival secondary predicate. Resultatives do not appear to be accompanied by the same degree of prosodic markedness as is found in Irish depictives. This observation aligns with generalizations in previous literature which predict that depictives will have greater prosodic independence than resultatives (Schulze-Berndt & Himmelmann 2004:66, Irimia 2012:208). This fact follows from a syntactic analysis of depictive secondary predicates as adjunct structures, and resultatives as complement to the verbal head (Irimia 2012).

is a velarized voiceless alveolar sibilant [sʲ]: the weak turbulent noise of the glottal fricative in Figure 2 (left) contrasts with the high average frequency and greater amplitude of the sibilant in Figure 2 (right). The velarization of the sibilant can be seen in maintenance of a low F2 throughout assibilation with delayed formant transition to high F2.

Final lengthening of the vowel in *bhó* ‘cow’ in Figure 2 (right) provides additional evidence: the raw duration of the final vowel of the noun preceding the secondary predicate adjective (right) is 7.4% longer than the final vowel of the noun preceding the attributive adjective (left). Correcting for speech rate and considering the duration of the final vowel in the noun preceding the target adjective against the determiner phrase (DP), the duration of the final vowel preceding the secondary predicate adjective (right) is 12% longer than the final vowel in the noun preceding the attributive adjective (left). The odds ratio is 1.16.

In corpus example (13), lenition applies only to the first of two adjectives following the lenition trigger; the unlenited second adjective in (13b) has a secondary predicate interpretation. In the hypothetical example in (13a) with lenition of the second adjective, its interpretation as an attributive results in an infelicitous reading.

(13) a. Attributive adjective

luigh sé siar ar an leaba^L **dhúbailte thraoch-ta** [ɣʲu:bʲəɫʲtʲə hrʲe:xʲtʲə]
 lie.PST 3SG.M back on DET bed double exhaust-PST.PTCP
 #‘He lay down on the exhausted double bed.’

b. Depictive adjective (Ní Leannáin 2015, *Dílís*)

luigh sé siar ar an leaba^L **dhúbailte, TRAUCH-TA** [ɣʲu:bʲəɫʲtʲə tʲrʲe:xʲtʲə]
 lie.PST 3SG.M back on DET bed double exhaust-PST.PTCP
 ‘He_i lay down on the double bed exhausted_i.’

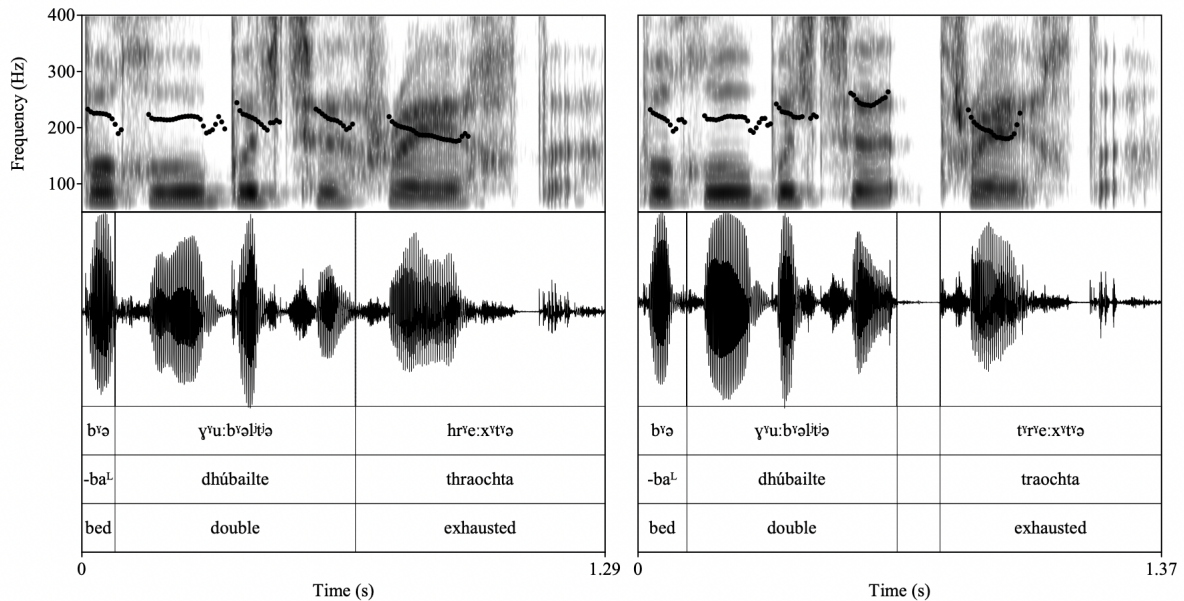


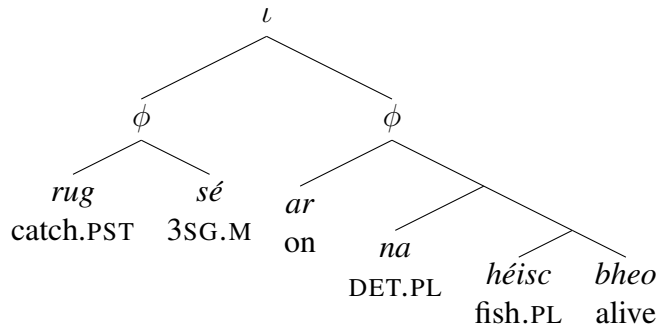
Figure 3. Extracts from (13a) (left) and (13b) (right).

In addition to the lack of lenition in (13b) in Figure 3 (right), the secondary predicate adjective is accompanied by a pause and lengthening of the final vowel in the preceding attributive adjective *dúbailte* ‘double’. The raw duration of the final vowel in *dúbailte* ‘double’ (right) is 21.6% longer than the final vowel of *dúbailte* ‘double’ (left). Correcting for speech rate, the duration of the final vowel preceding the secondary predicate adjective (right) is 5% longer than the final vowel in the noun preceding the attributive adjective (left). The odds ratio is 1.3. Note also greater amplitude of the syllable preceding the secondary predicate adjective *thraochta* ‘exhausted’ as compared to the attributive *thraochta* ‘exhausted’, and a marked boundary tone at the close of the attributive adjective *dúbailte* ‘double’ in Figure 3 (right).¹³

In sum, the surface forms of the attributive adjectives in Figures 1-3 (left) demonstrate the application of grammatical lenition (and the lack of final lengthening, pauses, or pitch resetting) to the exclusion of the secondary predicate adjectives in Figures 1-3 (right). The domain of lenition application must therefore *include* attributive adjectival structures but *exclude* secondary predicate structures, and this domain is further marked by the presence or absence of phonetic cues.

Assuming a prosodic hierarchy of Irish that includes an intonational (ι) and prosodic (ϕ) phrase above the level of the word (ω) (Selkirk 1986; Nespor & Vogel 2007), MATCH PHRASE requires that the attributive adjective and noun pairs to which lenition applies be contained within the same prosodic phrase (ϕ) (Selkirk 2011). This reflects their proximate syntactico-semantic structural relationship as in (3). Lenition therefore provides indirect evidence for this prosodic structural relationship: following Carnie (1991), lenited elements can not be external to the minimal prosodic phrase (ϕ_{MIN}) which contains the lenition trigger. This prosodic adjacency between trigger and attributive adjective is represented in (14) below:

(14) Prosodic parse of attributive example (11a) ‘He caught the live fish’.

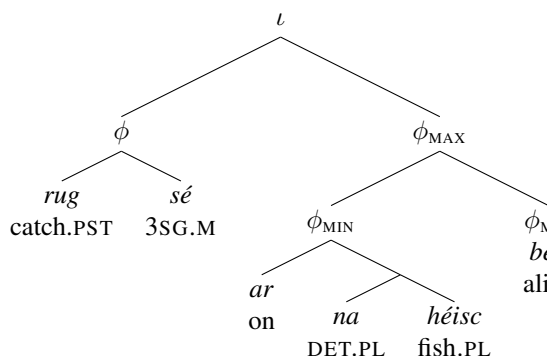


In contrast, secondary predicate adjectives are not expected to be contained within the same prosodic or syntactic phrase as their antecedent noun. Lenition is not expected to apply to the secondary predicate domain, which is born out in the data provided. In the prosodic parse, secondary predicates must constitute their own ϕ_{MAX} or ι -phrases as in (15) and (16) respectively. Such a significant boundary is further expected to be marked by pauses, pitch/tonal cues, and final lengthening typologically. So, secondary predicates are extraposition structures which may project conspicuously high, and their derivation therefore requires recursivity.¹⁴

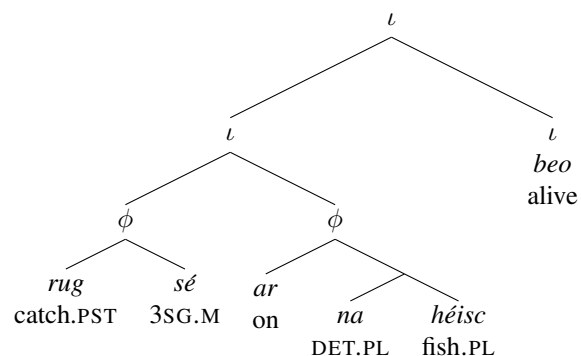
¹³ We acknowledge the scarcity of the data reported in this paper, and we draw no broader conclusions from only the examples provided here.

¹⁴ This can be captured by ranking a constraint like LAYEREDNESS \gg NON-RECURSIVITY (Selkirk 1986; Féry

(15) Prosodic parse of depictive example (11b) ‘He caught the fish_i alive_i.’



(16) Alternative prosodic parse of (11b).



There is a closer structural relationship between the attributive NP and AP construction in (14) compared to the secondary predicate NP and AP construction in (15) and (16). That is, the morphophonological interaction is blocked when the prosodic/syntactic structural distance becomes greater, and the identified phonetic cues reinforce the existence of this prosodic structural difference.

Given evidence from phonetic cues characteristic of intonational boundaries (e.g. pauses and tonal cues) in the data, projection to the level of an ι -phrase (16) may be independently motivated for depictive examples (8b-13b). If the syntactic representation of bare adjectival secondary predicates is a reduced small clause of the type discussed in §2.2, MATCH CLAUSE (Selkirk 2011) would likewise predict the structure in (16). The resultative secondary predicate in (12b) may instead be captured with (15), given that resultatives are not accompanied by the same pitch reset or pause, and are more deeply embedded syntactically (Milway 2019). However, this is outside the scope of this paper and requires further research.

3.2. EVIDENCE FROM ITALIAN. Standard Italian provides additional evidence that the secondary predicate is not contained within the same prosodic phrase as its antecedent. First, the secondary predicate in (17b) is stressed and accompanied by pitch resets and pauses, but the attributive adjective that shares the same surface distribution in (17a) is not.

(17) a. Attributive adjective

Giovanni ha mangi-ato la carne **cruda**
 Giovanni AUX eat-PST.PTCP DET meat raw
 ‘Giovanni ate the raw meat.’

b. Depictive adjective

Giovanni ha mangi-ato la carne **CRUDA**
 Giovanni AUX eat-PST.PTCP DET meat raw
 ‘Giovanni ate the meat_i raw_i.’

In Southern Italian dialects, the external sandhi phenomenon of “syntactic” consonant gemination (*raddoppiamento sintattico*) demonstrates sensitivity to the presence of ϕ -boundaries and

2015).

the position of elements within them (Nespor & Vogel 1982, 2007; Absalom et al. 2003). While gemination applies to attributive modifiers (18a), it does not apply to secondary predicates (18b).

(18) a. Attributive adjective

ho mangi-ato quest-i tre **crud-i** [k:rudi]
 AUX.1SG.PRS eat-PST.PTCP DEM-PL three raw-PL
 ‘I have eaten these three raw ones.’

b. Depictive adjective

ho mangi-ato quest-i tre **CRUD-I** [krudi]
 AUX.PRS.1SG eat-PST.PTCP DEM-PL three raw-PL
 ‘I have eaten [these three ones]_i raw_i.’

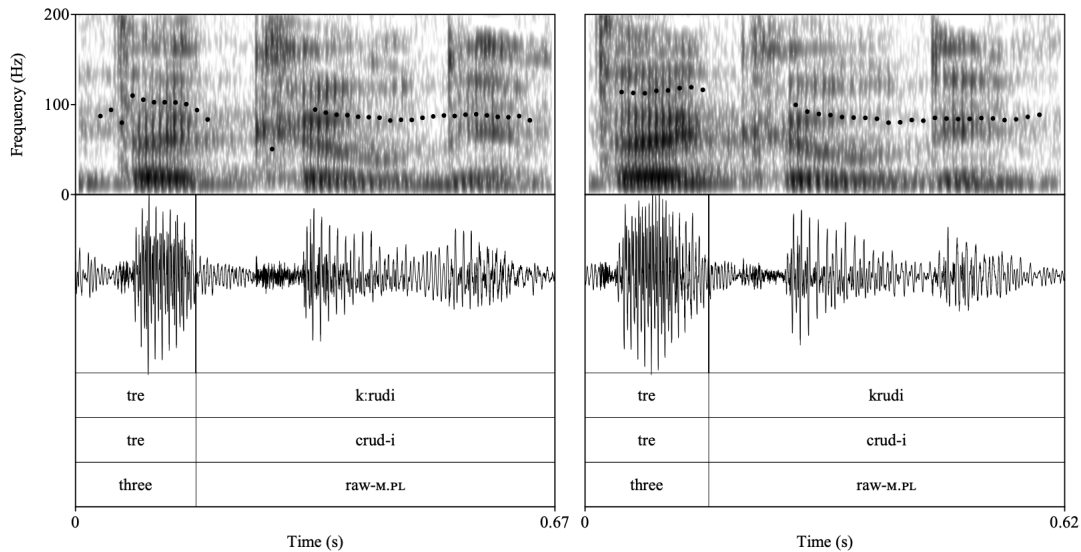


Figure 4. Extracts from attributive (18a) (left) and depictive (18b) (right).

Similar to the Irish data above, the absence of a process bears on the distinct prosodic structural relationships characteristic of attributive modifiers and secondary predicate APs—“syntactic” consonant gemination is blocked because the secondary predicate AP is external to the phonological phrase that contains the antecedent noun (Figure 4 right) which otherwise triggers gemination when the adjective is attributive (Figure 4 left). That secondary predicates in Italian can be accounted for under the analysis in §3.1 and the structures in (15) and (16) is further substantiated by the pitch breaks and pauses in speech that likewise accompany Italian secondary predicates.

A vowel length contrast is also expected and born out: the antecedent to the secondary predicate has a lengthened vowel characteristic of a phrase boundary, while the head noun in the attributive construction in (18a) has no final lengthening. The raw duration of the final vowel of the noun preceding the secondary predicate adjective (right) is 12.3% longer than the final vowel of the noun preceding the attributive adjective (left). Correcting for speech rate as above, the duration of the final vowel preceding the secondary predicate adjective (right) is 1.5% longer than the final vowel in the noun preceding the attributive adjective (left), and the odds ratio is 1.05. Note, however, that vowels commonly shorten before geminates; duration is compensatory.

3.3. EVIDENCE FROM GEORGIAN. Georgian secondary predicates are frequently accompanied by a distinct reset in pitch and final lengthening. The pattern of boundary tones in (19b) confirms that secondary predicates project to a level higher on the prosodic hierarchy than its attributive counterpart (19a).

- (19) a. Attributive adjective
gaorebul-i vač'r-eb-i ga-movidn-en saxli-dan
 confused-NOM merchant-PL-NOM PVB-come.out-3PL.AOR house-from
 'The confused merchants came out of the house.'
- b. Depictive adjective
 vač'r-eb-i **GAOREBUL-I** ga-movidn-en saxli-dan
 merchant-PL-NOM confused-NOM PVB-come.out-3PL.AOR house-from
 'The merchants_i came out of the house confused_i.'

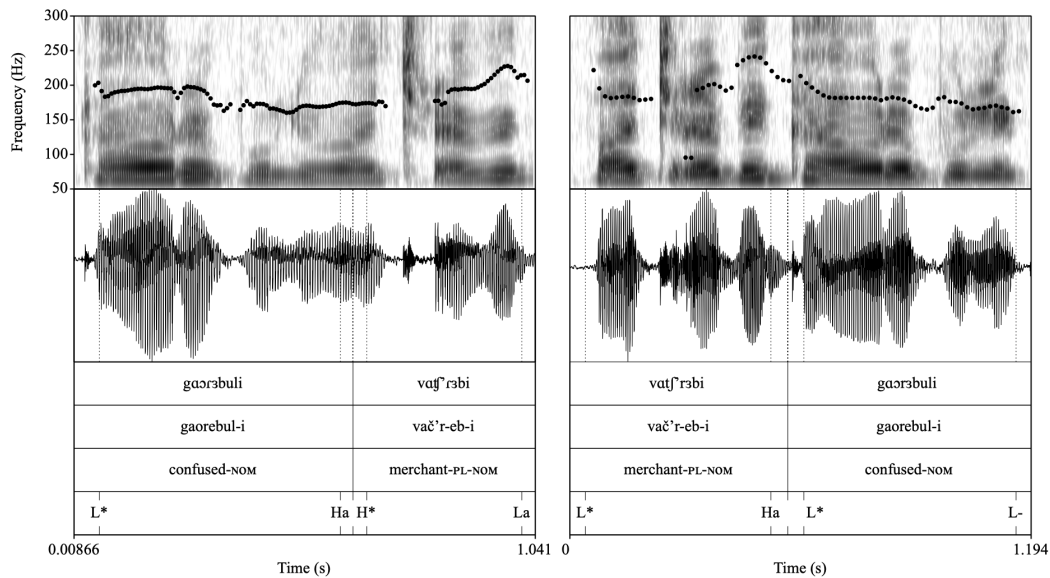


Figure 5. Attributive (19a) (left) and depictive (19b) (right).

The attributive adjective and head noun in (19a) and corresponding Figure 5 (left) is composed of a rising and a falling accentual phrase which demonstrate no lengthening on final syllables. The secondary predicate adjective in (19b) and corresponding Figure 5 (right) has a low boundary tone hosted on a final syllable which is itself long. Following Jun et al. (2007), a lengthened syllable across which a boundary tone is spread (H-, L-, and L+H- on intermediate phrase final syllables and H%, L%, and HL% on intonation phrase final syllables) is characteristic of prosodic groupings which correspond to higher prosodic structure in Georgian. Thus the secondary predicate AP in (19b) is outside of the prosodic phrase which contains the antecedent noun and can be captured under the analysis of (15) or (16).¹⁵ Note also that the attributive adjective and noun

¹⁵ Although we mark the boundary tone in Figure 5 (right) L-, it is difficult to distinguish between the *degree* of lengthening on the relevant syllables. While the pattern of boundary tones clearly indicates that secondary predicates project higher than attributive adjectives, it is unclear to which level they project and whether they correspond to a ϕ_{MAX} or an ι boundary.

pair does not contain a pause, while the secondary predicate adjective and its antecedent noun are separated by a pause.

Unlike Irish and Italian, no sandhi/mutative effect applies (or fails to apply) that marks secondary predicate adjectives prosodically. But, like Irish and like Italian, that secondary predicates in Georgian appear to constitute their own prosodic constituents is manifest in cues like boundary tones, final lengthening, and pauses.

4. Summary and conclusions. That syntactic representations map to prosodic structure is well-established. According with their syntactic complexity, secondary predicates are frequently characterized by prosodic behavior which is distinct from other modification structures. The exact nature of this prosodic behavior varies cross-linguistically. We have shown that in Irish, the initial mutation system never applies to the initial segment in the secondary predicate adjective, and secondary predicates are accompanied by other phonetic cues characteristic of significant prosodic boundaries. Beyond Irish, secondary predicate structures likewise demonstrate notable prosodic behavior in languages like Italian and Georgian via sandhi processes, final lengthening, and tonal cues. This behavior reflects the syntactico-semantic complexity of secondary predicate structures and therefore offers insight into the correspondence between these components of the grammar.

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