

# ARGUMENT- $\phi$ : A Prosodic Account of Pseudo Noun Incorporation\*

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## 1. Introduction

This paper explains the VOS order of Niuean pseudo noun incorporation (PNI) by appealing to a condition on prosodic well-formedness, ARGUMENT- $\phi$  (ARG- $\phi$ ), that requires a head and its internal argument(s) to form a unique phonological phrase. In order to satisfy this requirement, the incorporated argument undergoes prosodic restructuring into a position adjacent to the verb at PF. On this account, the verb always arrives at its clause-initial position via  $X^0$ -raising, so the syntactic input to the prosodic grammar is VSO, while the prosodic output is VOS (for PNI constructions). This analysis eliminates the need to posit different locations for the generation of internal arguments based on eventual surface structure (VSO or VOS) (cf. Massam 2001), which results in a simpler syntax of PNI. This account of Niuean PNI is also compatible with a uniform  $X^0$ -raising analysis of verb-initial structures, which allows for a more parsimonious account of Niuean argument structure and the formation of the verbal complex, especially when compared to an XP-movement analysis (see Clemens 2014).

The remainder of the paper is organized as follows: Section 2 reviews the Niuean PNI construction, Massam's (2001) syntactic analysis of Niuean PNI, and the syntax of Niuean clause structure assumed in this proposal (Clemens 2014); Section 3 introduces ARG- $\phi$ , a prosodic well-formedness constraint mandating that heads and their internal arguments are phrased together; Section 4 implements the proposal in the context of Match Theory (Selkirk 2011); Section 5 uses Multiple Spell-out (Uriagereka 1999) and Phase Theory (Chomsky 2000, 2001) to account for the fact that NP, but not DP objects surface in PNI constructions; and Section 6 concludes.

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## 2. Niuean PNI and the syntactic account

Niuean is a dependent-marking ergative language that employs different case-marking paradigms for common nouns and proper nouns. While the ‘basic’ word order in Niuean is VSO, sentences can also surface in VOS order under pseudo noun incorporation (PNI) (Massam 2001, Seiter 1980). Although the incorporated object may appear to form some sort of compound with the verb, these constructions are distinct from ‘true’ incorporation structures, because the incorporated object is phrasal (Massam 2001):

- (1) a. Kua fakahū he ekekafo e **tohi**.  
 PFV send ERG doctor ABS letter  
 ‘The doctor sent the letter.’ *Niuean VSO*
- b. Kua fakahū **tohi** e ekekafo.  
 PFV send letter ABS doctor  
 ‘The doctor sent the letter.’ *Niuean VOS/PNI*

The following characteristics differentiate PNI(VOS) constructions from their VSO counterparts (Clemens 2014; Massam 2001; Seiter 1980; a.o.):

- (2) *Characteristics of PNI*
- a. PNI applies to direct, middle, and instrumental objects, which
  - b. surface immediately to the right of the verb and precede postverbal particles;
  - c. are not preceded by overt functional morphology;
  - d. can be modified by adjectives, coordinate phrases, and nonfinite relative clauses;
  - e. *tend* to be non-specific or non-referential.

Finally, VSO and PNI clauses differ with respect to their prosodic constituency, which can be represented as in (3) below:<sup>1</sup>

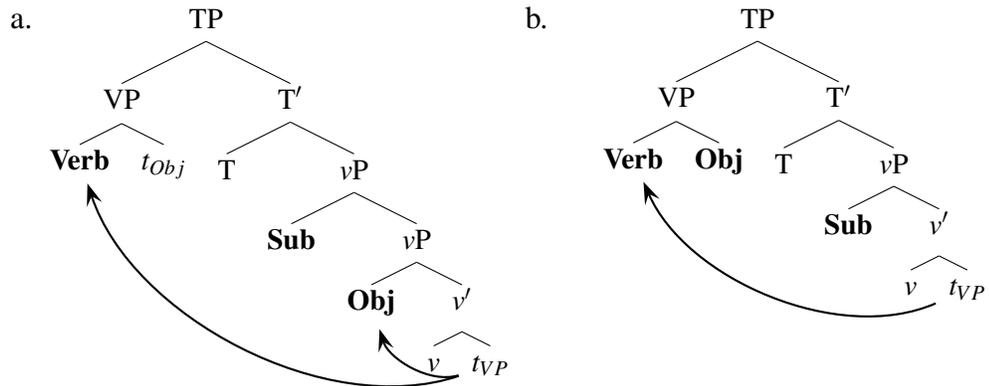
- (3) *The prosody of VSO vs. VOS clauses*
- a. (V)φ(S)φ(O)φ
  - b. (V O)φ(S)φ

The syntactic analysis of VSO/PNI alternations comes from Massam (2001). In the case of canonical VSO, Massam proposes that, when a transitive verb selects a DP object, that object leaves the VP for case-checking purposes. V1 is subsequently achieved by fronting the remnant VP to the specifier of TP (2a). The difference between VSO and PNI stems from the type of object the verb selects. Unlike DPs, NP objects do not require case; hence, they have no reason to leave the VP. If V<sup>0</sup> selects an NP, both the V<sup>0</sup> and the NP move when the VP moves. As shown in (2b), this derivation results in the VOS order of PNI clauses.

<sup>1</sup>See Clemens (2013, 2014) for more on the prosody of VSO vs. VOS clauses.

*A Prosodic Account of Pseudo Noun Incorporation*

(4) *VSO via VP-(remnant) movement*



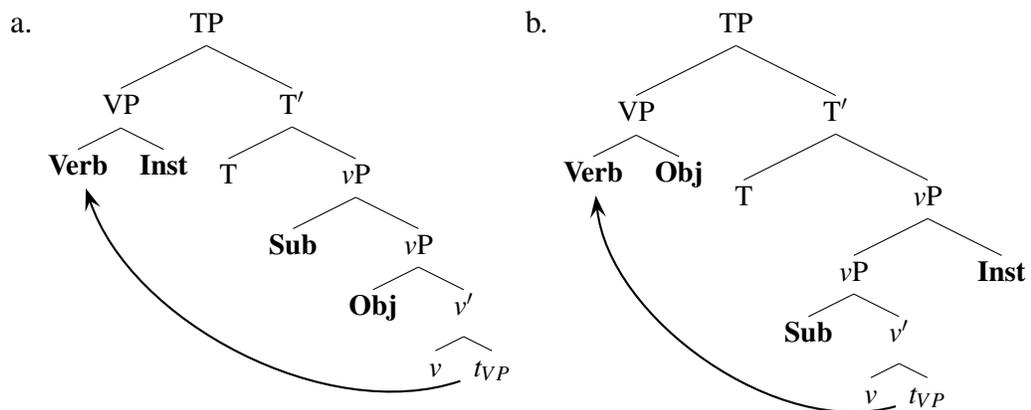
Massam’s account applies straightforwardly to examples with direct objects (1b) (PNI-Abs) and examples with incorporated middles (PNI-Mid); however, instrumental arguments also surface in PNI constructions (PNI-Inst), and do so even when the sentence includes a DP direct object, as in (5):

- (5) Kua fakahū *vakalele* he ekekafo e tohi.  
 PFV send airplane ERG doctor ABS letter  
 ‘The doctor sent the letter on the airplane.’

On Massam’s account, a PNI verb selects an NP complement. In the PNI-inst construction, therefore, it must be the instrumental NP that is sister to the verb (4a). In order to provide a uniform account of PNI generally, Massam must postulate that in examples like (5), direct objects are generated in a specifier of VP, where they are still accessible for case checking, but not implicated in VP-raising.

However, it is unclear why a direct object should be generated as sister to  $V^0$  only when the clause does not *also* contain an NP instrumental. Likewise, it is unclear why an instrumental argument should be generated as sister to  $V^0$  only when it projects no higher than NP (4a), but adjoined higher in the clause when it surfaces as a PP, as shown in (4b).

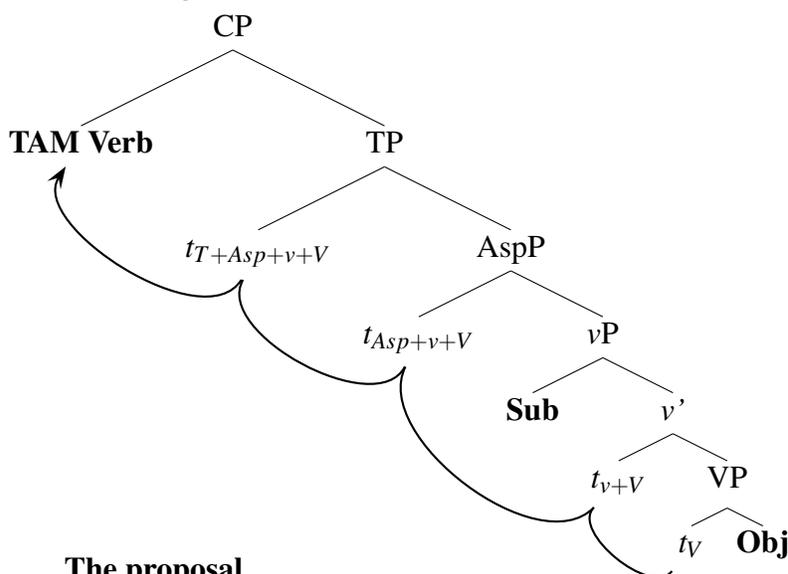
(6) *Instrumental PNI and PPs*



In sum, different types of PNI constructions have similar syntactic and morphosyntactic profiles. Massam accounts for this similarity by proposing that all PNI constructions contain a VP consisting of a  $V^0$  and an NP; however, this surface uniformity necessitates a considerable degree of variation in the generation of arguments for each PNI/VSO pair. Absolutive objects can be selected by  $V^0$  (as in PNI-abs and VSO clauses) or they can be generated in the specifier of the projection associated with absolutive case (as in PNI-inst constructions). Instrumentals are selected by  $V^0$  in PNI-inst constructions, but adjoined to  $vP$  when they surface as PPs.

This syntactic analysis of PNI is incompatible with the idea that thematic relationships between predicates and arguments are structurally encoded (Baker 1988, 1997 and others). The prosodic account of Niuean PNI presented below offers a solution to the problem of the structural encoding of thematic relationships, because it assumes a syntax where the *in situ* location of a direct object does not depend on its functional structure; the same applies for middles and instrumentals. See (Clemens 2014) for arguments that  $V^0$ -raising affords a more parsimonious account of Niuean’s verbal complex, especially when compared to a VP-movement analysis, and that it is possible to account for the inverse scope of postverbal elements without VP roll-up movement. Everything that follows assumes (7) as a basic representation of the syntax of both VSO and PNI constructions.

(7)  $V^0$ -raising



### 3. The proposal

The prosodic approach to PNI is based on a constraint, the *Argument Condition on Phonological Phrasing* (ARG- $\phi$ ), which mandates that a verb and its internal arguments be parsed into a single phonological phrase ( $\phi$ -phrase). In other words, the prosodic grammar prefers structures in which head-argument pairs are pronounced together. Precedents for proposing a specific prosodic constraint dedicated to the parsing of head-argument pairs include Sekirk’s (1984) *Sense Unit Condition*, Henderson’s (2012) COMPLEMENT- $\phi$  (Henderson 2012), and Richards’ (2014) *Selectional Contiguity*.

For this and related proposals, a question arises as to how the prosodic component of the grammar is able to recognize members of a head-argument pair. This issue is discussed at length in Clemens (2014), but in short, i) treating categorial selection (c-selection) as an instance of AGREE (Emonds 2000, Adger & Svenonius 2011) and ii) adopting a feature-sharing approach to AGREE (Pesetsky & Torrego 2007) allows the prosodic grammar to reference head-argument pairs via lexical class features.<sup>2</sup> Thus, the intuition that head-argument pairs must be phrased together is formalized by making use of the idea that heads and their selected arguments share a lexical class feature between them, as in (8):

- (8) ARGUMENT CONDITION ON PHONOLOGICAL PHRASING: A head H with a categorial feature [C] and head C with the same [C] feature must constitute a  $\phi$ -phrase.

Applied to Niuean, (8) captures the fact that VP-internal arguments (direct, middle, instrumental objects) undergo PNI, while arguments not selected by the verb (e.g., benefactives and goals) do not (Massam 2001). An analysis of instrumental arguments as syntactically distinct from other classes of PPs is necessary elsewhere in the grammar of Niuean: all instrumental arguments, not only those in applicative constructions, behave like subjects and direct objects with regard to relative clause formation and the ability to scope under the postverbal particle *oti* ‘all’ (Seiter 1980, Massam 2013). Middle objects fall somewhere between instrumentals and other obliques in terms of their behavior as core arguments. Because middle objects behave like absolutive and instrumental objects (i.e., like internal arguments) in PNI constructions, following Chung (1978), they are generated VP-internally.

The internal arguments of the Niuean verb also include unaccusative subjects and clausal complements, yet, PNI never occurs with these elements. In fact, as noted above, all DP arguments are incompatible with PNI, including pronouns, proper nouns, and unaccusative subjects. ARG- $\phi$  does not distinguish between NP and DP arguments; the problem of restricting the application of PNI to NP arguments will be solved in Section 5 via Multiple Spell-Out and Phase Theory (Uriagereka 1999, Chomsky 2000, 2001). For now, Section 4 addresses the implementation of ARG- $\phi$ .

#### **4. Implementing ARG- $\phi$**

The prosodic approach to PNI is situated in Match Theory (Selkirk 2011), which is an indirect reference theory of the syntax-phonology interface. Indirect reference theories maintain that phonological rules apply to prosodic domains built on syntactic structure, as opposed to applying to syntactic domains directly.

Match Theory addresses positive evidence for the existence of recursion in prosodic structure building (see Elfner 2015, Wagner 2010, and sources cited therein). MATCH Constraints are input-output correspondence constraints (McCarthy and Prince 1995) that call for isomorphism between syntactic and prosodic constituents, requiring that syntactic constituents (the input) and prosodic constituents (the output) correspond at three levels (9):

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<sup>2</sup>See Kaisse (1985), Nespor & Vogel (1986) and Smith (2011) for independent evidence that lexical class features are taken into account during prosodic structure assignment.

- (9) a. MATCH-*l*: Clauses (CP/IP) and intonational phrases must correspond.  
 b. MATCH- $\varphi$ : Syntactic XPs and phonological phrases must correspond.  
 c. MATCH- $\omega$ : Syntactic X<sup>0</sup>s and prosodic words must correspond.

Selkirk’s MATCH Constraints are violable in the context of Optimality Theory (Prince & Smolensky 1993/2004), making it possible to capture syntax-prosody nonisomorphisms: if a prosodic well-formedness constraint outranks a MATCH Constraint, a syntax-prosody nonisomorphism may result. Assuming all V1 structures in Niuean are derived via head-raising, a VSO output is more isomorphic than the VOS word order of PNI constructions. In order for VOS to surface, ARG- $\varphi$  must outrank at least one MATCH Constraint.

The tableau in (10) demonstrates how ARG- $\varphi$  interacts with the MATCH Constraints and illustrates three outputs of a sentence with an NP object: a) a strictly isomorphic representation of the input, b) an alternative that satisfies ARG- $\varphi$  by shifting the object to the verb, and c) one that shifts the verb to the object. In this and following examples, ‘verb’ refers to a complex head minimally including V<sup>0</sup>, Asp<sup>0</sup>, T<sup>0</sup>, and C<sup>0</sup>.

(10)

| Input:<br>[ <i>CP</i> Verb [ <i>DP</i> Subject] [ <i>VP</i> <i>t<sub>V</sub></i> [ <i>NP</i> Object]]] | ARG<br>$\varphi$ | MATCH<br>( $\varphi$ , XP) | MATCH<br>(XP, $\varphi$ ) |
|--|------------------|----------------------------|---------------------------|
| a. (Verb (Subject) $\varphi$ (Object) $\varphi$ ) <i>l</i>   | *!               |                            |                           |
| b.  ((Verb Object) $\varphi$ (Subject) $\varphi$ ) <i>l</i>  |                  | *                          | *                         |
| c.  ((Subject) $\varphi$ (Verb Object) $\varphi$ ) <i>l</i>  |                  | *                          | *                         |

Next, there needs to be a way to distinguish between candidates (b) and (c). Although both (b) and (c) satisfy ARG- $\varphi$ , PNI structures always surface as VOS (as in b), rather than SVO (as in c). Initial positions are known to be privileged at different levels of the prosodic hierarchy (Becker 2009, Beckman 1997). As such, the preference of candidate (b) over candidate (c) is treated as an instance of positional faithfulness to the initial edge of the *l*-phrase, as articulated in (11):

- (11) MATCH-*l*<sub>INITIAL</sub>: The initial edge of an *l*-phrase and the initial edge of a syntactic clause must correspond.

In an isomorphic output, the *l*-phrase boundary would be realized on the verb. In (12), candidate (c) incurs a violation of MATCH-*l*<sub>INIT</sub>, because the verb shifts to a position adjacent to the object in order to satisfy ARG- $\varphi$ . From a phrase-medial position, the verb cannot anchor the initial edge of the *l*-phrase without incurring additional violations of MATCH-*l*. In contrast, the object in candidate (b) shifts to the verb, which simultaneously satisfies ARG- $\varphi$  and MATCH-*l*<sub>INIT</sub>, because the initial *l*-phrase boundary is realized on the verb.

(12)

| Input:<br>[ <sub>vP</sub> Verb [ <sub>VoiceP</sub> [ <sub>DP</sub> Subject] [ <sub>VP</sub> [ <sub>NP</sub> Object]]]]] | ARG       | MATCH     | MATCH             | MATCH            |
|---|-----------|-----------|-------------------|------------------|
|   | $\varphi$ | $l_{INT}$ | ( $\varphi$ , XP) | (XP, $\varphi$ ) |
| a. (Verb (Subject) $\varphi$ (Object) $\varphi$ ) $l$   | *!        |           |                   |                  |
| b. $\text{☞}$ ((Verb Object) $\varphi$ (Subject) $\varphi$ ) $l$  |           |           | *                 | *                |
| c. ((Subject) $\varphi$ (Verb Object) $\varphi$ ) $l$   |           | *!        | *                 | *                |

There is at least one other way to satisfy both ARG- $\varphi$  and MATCH- $l_{INT}$  that incurs fewer MATCH violations than candidate (b). See Clemens (2014) for a discussion of how the constraint STRONG START (Bennett et al. 2016, Elfner 2015, Selkirk 2011, Werle 2009) accounts for the attested phrasing of VOS as well as the attested phrasing of VSO.

### 5. When PNI does not occur

Based on the account presented thus far, ARGUMENT- $\varphi$  should trigger VOS word order whenever the verb selects an internal argument, but PNI only occurs with internal arguments of the category NP. The solution to this problem is based on Multiple Spell-out (Uriagereka 1999) and Phase Theory (Chomsky 2000, 2001). Various aspects of Phase Theory are contested; here, the following positions are adopted:

- (13) Phase Theory specifics (Chomsky 2001, Dobashi 2003, Svenonius 2004)
- $D^0$  (like  $v^0$  and  $C^0$ ) is a phase head.
  - The spell-out domain consists of a phase head and its complement.
  - A domain is spelled-out when the next phase head is merged.

One of the things that happens at each spell-out cycle is that syntactic constituents are assigned prosodic structure (Ishihara 2007, Kahnemuyipour 2004, Kratzer & Selkirk 2007), which involves evaluating constraints on prosodic well-formedness. However, syntactic features become invisible after prosodic structure is first assigned. This affects the way certain prosodic constraints influence the surface form of an utterance.

Take ARG- $\varphi$  as an example; in the previous section, it was proposed that the prosodic component of the grammar references lexical category features when evaluating compliance with ARG- $\varphi$ . Prosodic constraints that reference syntactic features, like ARG- $\varphi$ , will not be able to see the relevant syntactic features on previously spelled-out material. More directly, if a head and its internal argument are spelled-out in different cycles, ARG- $\varphi$  will only be able to see one instantiation of the relevant lexical feature at a time.

The spell-out of an NP object, which does not include a phase head, is part of a spell-out domain headed by  $v^0$ . As such, spell-out of the NP argument is not triggered until  $C^0$  enters the derivation. Thus, both instantiations of the categorial feature relevant to Arg- $\varphi$  (one associated with the object and one with the verb) are visible to PF during the same spell-out cycle. In contrast, the spell-out of a DP object, which includes a phase head, is triggered by the introduction of the next phase head  $v^0$ , which means that the two instantiations of

the relevant categorial feature are never visible to PF at the same time. The tableau in (14) illustrates that both instantiations of [N] are visible during the same spell-out cycle, while tableau (15) illustrates that the two relevant instantiations of [D] are not. In these tableaux, material that was assigned prosodic structure in an earlier spell-out cycle is crossed out and the relevant lexical feature is not shown.

(14) *Spell-out timing of an NP object resulting in VOS*

| Input:<br>[ <sub>VP</sub> Verb [ <sub>VoiceP</sub> [ <sub>DP</sub> Subject] [ <sub>VP</sub> [ <sub>NP</sub> Object]]]]]                 | ARG       | MATCH     | MATCH           | MATCH           |
|---|-----------|-----------|-----------------|-----------------|
|   | $\varphi$ | $u_{INT}$ | $(\varphi, XP)$ | $(XP, \varphi)$ |
| a. (Verb <sub>[N]</sub> ( <del>Subject</del> ) $\varphi$ (Object <sub>[N]</sub> ) $\varphi$ ) $\iota$                                   | *!        |           |                 |                 |
| b. <del>((Verb<sub>[N]</sub> Object<sub>[N]</sub>)<math>\varphi</math>(<del>Subject</del>)<math>\varphi</math>)<math>\iota</math></del> |           |           | *               | *               |
| c. (( <del>Subject</del> ) $\varphi$ (Verb <sub>[N]</sub> Object <sub>[N]</sub> ) $\varphi$ ) $\iota$                                   |           | *!        | *               | *               |

(15) *Spell-out timing of a DP object resulting in VSO*

| Input:<br>[ <sub>VP</sub> Verb [ <sub>VoiceP</sub> [ <sub>DP</sub> Subject] [ <sub>VP</sub> [ <sub>NP</sub> Object]]]]]   | ARG       | MATCH     | MATCH           | MATCH           |
|---|-----------|-----------|-----------------|-----------------|
|   | $\varphi$ | $u_{INT}$ | $(\varphi, XP)$ | $(XP, \varphi)$ |
| a. <del>(Verb<sub>[D]</sub> (<del>Subject</del>)<math>\varphi</math>(Object)<math>\varphi</math>)<math>\iota</math></del> |           |           |                 |                 |
| b. ((Verb <sub>[D]</sub> Object) $\varphi$ ( <del>Subject</del> ) $\varphi$ ) $\iota$                                     |           |           | *!              | *               |
| c. ((Subject) $\varphi$ (Verb <sub>[D]</sub> Object) $\varphi$ ) $\iota$  |           | *!        | *               | *               |

In (14), ARG- $\varphi$  influences the way prosodic structure is assigned, because the categorial feature [N] associated with the verb on account of c-selection and the same [N] feature associated with the NP object are visible to the prosodic component of the grammar at the same time. As such, they must constitute a  $\varphi$ -phrase. In contrast, ARG- $\varphi$  does not influence the way prosodic structure is assigned in (15), because the two relevant categorial features are associated with heads that are assigned prosodic structure in different spell-out cycles.

## 6. Conclusion

Building on the finding that the verb and the incorporated argument in PNI constructions form a unique  $\varphi$ -phrase (Clemens 2013, 2014), I have argued that the movement of the verb into initial position is syntactic, but that the position of the object is prosodically motivated and hence post-syntactic. The syntactic input to the prosodic grammar is VSO (derived via X<sup>0</sup>-raising), while the prosodic output is VOS. This account differs from the traditional approach to PNI, in which both the verb and the incorporated argument move into clause-initial position in the syntax (Massam 2001).

On the present account, ARGUMENT- $\varphi$  – a prosodic constraint mandating that heads and their internal arguments are realized in the same  $\varphi$ -phrase – motivates the post-syntactic shifting of the object to the *ex situ* location of the verb. In the syntax of a VSO clause, the verb and the object are non-adjacent. As such, the head-argument relationship between the verb and the object cannot be gleaned from syntactic constituency. The technology of feature checking and the notion of feature sharing (Pesetsky and Torrego 2007) are applied

## *A Prosodic Account of Pseudo Noun Incorporation*

to categorial selection, which makes head-argument pairs visible to PF even when they do not form a unique constituent. That syntactic domains are sent to the interfaces in stages (Uriagereka 1999, Chomsky 2001) captures the fact that internal arguments that include a phase head, e.g., a DP or PP (Svenonius 2004; Hiraiwa 2005), cannot be incorporated.

This analysis has two positive outcomes for Niuean syntax. First, it eliminates the need to posit different locations for the generation of absolutive, middle, and instrumental arguments depending on the type and number of arguments in the clause and the functional structure associated with them. Second, a prosodic account of Niuean PNI allows for a uniform  $V^0$ -movement analysis of Niuean V1, which in turn allows for a more straightforward account of Niuean argument structure and the formation of the verbal complex, especially when compared to a VP-movement analysis (see Clemens 2014).

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