M-merger and copy spell-out in Inuktitut noun incorporation*

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1.   Introduction

A long-standing issue in the analysis of noun incorporation (NI) concerns whether the noun-verb complex is derived by *syntactic movement* of the object or postsyntactic merger of the verb and an *in situ* object (Baker 1988, Barrie & Mathieu 2016, Levin to appear). The same question pervades the literature on word formation and affixation more generally (see e.g. Harley 2013, Gribanova & Harizanov to appear for recent discussion). This paper investigates these questions from the point of view of Inuktitut, an Inuit language of Northern Canada, and argues that both NI and polysynthetic word formation in Inuit are *postsyntactic phenomena*, derived by successive m-merger between adjacent elements along the clausal spine.

I argue that incorporated nominals in Inuktitut are *syntactically active*, in that they remain accessible for case, agreement, and even phrasal (A-/Ā-)movement operations, despite being overtly realized within the verb complex. These patterns follow straightforwardly from interactions between postsyntactic m-merger and general conditions on copy spell-out, building on Landau (2006). M-merger of a nominal copy in a movement chain prevents that copy from being deleted, in accordance to morphological well-formedness conditions on word formation.

The behaviour of NI in Inuktitut also presents an argument against recent phonological accounts of polysynthesis, which take polysynthetic languages to map clauses to single phonological words (Compton & Pittman 2010, Barrie & Mathieu 2016). Instead, I suggest that m-merger is a universally-available mechanism for word formation, but languages differ in the *degree* of m-merger required. The polysynthetic nature of Inuit comes from a requirement that *all* heads along the clausal spine undergo m-merger.

2.   Inuit noun incorporation

The Inuit languages are a continuum of dialects from the Eskimo-Aleut language family; Inuktitut is mainly spoken around the territory of Nunavut, Canada.[1] As noted above, the Inuit languages are polysynthetic, so verbal complexes alone may express propositional-level meaning. The order of morphemes in a given word generally follows the Mirror Principle. Assuming that Inuit is *right-headed* (Compton 2012, 2017), this means that the morphemes further to the right of the word correspond to a higher position in the syntactic structure. This is illustrated below:

(1)   a.   niri-juma-lau-nngit-tara
            eat-want-PST-NEG-1S.S/3S.O
            'I did not want to eat it.'

      b. $[_{AgrO} [_{AgrS} [_{Neg} [_T [_{Mod} [_{VP}$ eat] want] PST] NEG] 1S] 3S]

Though NI cross-linguistically tends to be optional and possible with a variety of verbs, NI in the Inuit languages is *obligatory* with a closed class of verbs, underlined throughout this paper, and impossible with all other verbs (Sadock 1980, Bok-Bennema & Groos 1988, Geenhoven 1998, Johns 2007, 2009). Following Johns (2007, 2009), I assume that these incorporating verbs are all light verbs (v^0s), while non-incorporating verbs are lexical verbs (V^0s).[2] As illustrated below, the object *sivalaaq* 'cookie' obligatorily surfaces within the verb complex adjacent to the light verb *tuq* 'consume,' (2a-b); however, it cannot be incorporated into a semantically similar verb, *niri* 'eat.' Note that only direct objects may undergo incorporation.

(2)   a.   **sivalaar**-<u>tuq</u>-tunga   b.   **sivalaar-mik** niri-junga
            cookie-consume-1S.S   cookie-MOD eat-1S.S
            'I am eating a cookie.'   'I am eating a cookie.'
            cf. *sivalaar-mik tuq-tunga   *cf.* *sivalaa-niri-junga

   Although Johns (2007, 2009) characterizes incorporated objects in Inuktitut as bare roots, Compton (2013) demonstrates that these objects are actually *phrasal*, as shown with the incorporated modified pronoun in (3a). The examples in (3) also show that incorporated objects are minimally DP-sized; this will be expanded upon in §3.

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[1]Unless otherwise cited, the Inuktitut data in this paper were collected by the author in Iqaluit, Nunavut, and represent various dialects spoken on Baffin Island, Nunavut.

[2]Evidence that the incorporating verbs are light verbs (functional, rather than lexical, elements) comes from the observation that they are all semantically underspecified, with very few s-selectional restrictions. For instance, the incorporating verb *tuq* 'consume' allows a semantically hetergeneous range of objects, while the non-incorporating verb *niri* 'eat' requires that its object be a food-type. See Johns (2007) and Cook & Johns (2009) for further discussion on the abstract semantics of light verbs and other Inuit suffixes.

(3) a. **[igvi-nngua]**-<u>liuq</u>-tunga   b. **tainna**-<u>u</u>-quuji-jutit
         2S-pretend-make-1S.S   DEM-be-seem-2S.S
         'I'm making a carving of you.'   'You look like that person.'

3. Incorporation in Inuktitut is postsyntactic

The Inuit languages generally display an ERG-ABS case patterning, which co-occurs with S/O ϕ-agreement. It has long been observed that, in NI contexts, ϕ-agreement targets only the subject (which is ABS rather than ERG), illustrated in (4), suggesting that the incorporated object cannot be cross-referenced by agreement. As a result, it is generally assumed that NI constructions are intransitive.

(4) **Jaani**   **sivalaa**-<u>tu</u>-ruma-juq
     Jaani.ABS cookie-consume-want-3S.S
     'Jaani wants to eat cookies.' *(want > cookies)*

However, a less-noted fact, only reported in Johns (2009), is that incorporated objects in Inuktitut may be cross-referenced by object agreement. Building on this finding, the example in (5) moreover demonstrates that, in such constructions, the subject remains ERG. Thus, NI is not necessarily detransitivizing; the intransitive example in (4) *alternates* with the transitive example in (5).

(5) Jaani-**up** **sivalaa**-<u>tu</u>-ruma-**jangit**
     Jaani-ERG cookie-consume-want-3S.S/3P.O
     'Jaani wants to eat (these specific) cookies.' *(cookies > want)*

This pattern is unexpected under most previous accounts of NI, which assume that incorporated objects are structurally reduced and thus inaccessible for ϕ-agreement. To account for other putative cases of ϕ-agreement with incorporated objects, Baker et al. (2005) propose that incorporation universally takes place by N^0-to-V^0 head movement (in line with Baker 1988), but some languages permit the object to leave *remnant ϕ-features* in the position of the trace. Under this view, ϕ-agreement targets these remnant features rather than the extracted object. Another approach comes from Levin (to appear), who argues that the presence of object agreement morphology actually reflects a *default form*, which appears in the absence of a viable ϕ-agreement target (cf. Preminger 2009).

 However, both approaches fall short for the Inuktitut data above. First, they cannot account for ERG case on the subject, which, regardless of the analysis of ergativity assumed, is only expected to appear in Inuit in bivalent constructions. Second, as an issue for Levin (to appear) in particular, the object agreement in (5) is 3P, not default. Finally, unlike in the intransitive example in (4), the incorporated object in (5) receives a *wide scope* interpretation, typical of standalone ABS objects in Inuit (cf. Bittner 1994, Wharram 2003). Together, these facts suggest that the incorporated object in (5) *is truly* ABS.[3]

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[3]As further discussed in §4.3, another piece of evidence that incorporated objects may receive ABS case comes from their ability to be participate in relative clauses. Like other Inuit languages, Inuktitut only allows

At this point, there is another seemingly viable alternative to these data: given that 3rd person pronouns in Inuit are null, perhaps the true grammatical object is actually a 3rd person pronoun doubling the incorporated nominal (reanalyzed under this approach as a modifier). This is essentially the approach taken by Rosen (1989) and Chung & Ladusaw (2004), given the existence of hyponymous doubling between an incorporated object and a standalone object in certain languages. However, hyponymous doubling is generally not possible in Inuktitut, (6). Thus, the incorporated object in (5) is truly ABS—and truly syntactically active.

(6) *tuktu-miniq   niqi-tu-ruma-jara
      caribou-former.ABS food-consume-want-1S.S/3S.O
      Intended: 'I want to eat this caribou meat.'

As mentioned, what these analyses have in common is the assumption that incorporated objects are structurally reduced. However, I have by now shown that incorporated objects in Inuktitut may be full DPs, and moreover permit the same range of syntactic processes and interpretations as their non-incorporated counterparts. This suggests that incorporated and non-incorporated objects are *syntactically equivalent*—instead differing only in the nature of the *verb* selecting for them (i.e. v^0 or V^0).

This, in turn, motivates a *postsyntactic analysis* of NI, in which NI is derived by m-merger between a v^0 and its object. For now, the term 'm-merger' refers to a postsyntactic operation that results in affixation between two adjacent elements (Marantz 1984, Bobaljik 1994, Harley 2013, a.o.); this will be refined later. Applying this to Inuit NI, the result is that the verb and its object end up spelled out as adjacent morphemes within a complex word. Because incorporation is postsyntactic, it does not affect syntactic operations such as case assignment or agreement.[4] Below, I discuss the interaction between postsyntactic NI and genuine instances of A- and Ā-movement of the incorporated object, as well as why m-merger applies to v^0s but not lexical V^0s.

ABS arguments to be relativized (e.g. Creider 1978, Bittner & Hale 1996, Manning 1996, Murasugi 1997). Thus, when an incorporated object is interpreted as the pivot of a relative clause, it must be ABS. Indeed, in such constructions, the subject of the embedded verb is always ERG, and the incorporated object is cross-referenced by object ϕ-agreement.

[4]However, incorporation *does* somewhat affect the morphological realization of the nominal. The incorporated nominal cannot surface with overt case morphology when it is expected to be MOD (based on case concord with stranded modifiers), nor can it be inflected with number in plural contexts, (i). I assume that this is a morphological effect, though leave the details of this for future research.

(i) pingasu-nik ujami-liu-qqau-junga
     three-MOD   necklace-make-REC.PST-1S.S
     'I made three necklaces.'

4. M-merger and copy spell-out

4.1 Conditions on copy spell-out

In this section, I show that, despite surfacing within the verb complex, an incorporated object in Inuktitut may also behave as though it has undergone *A- or Ā-movement*. This poses a derivational puzzle for movement-based analyses of NI: how can the object both incorporate by movement *and* undergo further movement? I argue that this can be resolved by appealing to phonological conditions on copy spell-out. According to the Copy Theory of Movement (Chomsky 1995), syntactic movement leaves behind a full copy of the extracted element. The choice of which copy (or copies) to pronounce may be parametrized depending on the language, but can additionally be shown to be subject to certain PF constraints. Following Landau (2006), copy spell-out and deletion are regulated by the following two principles:[5]

(7) a. *Economy of Pronunciation:* Delete all chain copies at PF up to P-recoverability.

  b. *P-Recoverability:* In a chain $<X_1 \ldots X_i \ldots X_n>$, where some X_i is associated with phonetic content, X_i must be pronounced.   (Landau 2006)

Though Economy of Pronunciation enforces the deletion of copies whenever possible, P-Recoverability ensures that at least one copy will always be spelled out. Crucially for our purposes, P-Recoverability also prevents the deletion of copies that are associated with *certain phonological requirements*. For example, Landau shows that copy deletion cannot apply if doing so would violate well-formedness conditions on wordhood (e.g. the Stray Affix Filter).

  This can be straightforwardly applied to Inuktitut NI. As shown earlier, m-merger between the verb and its object feeds affixation. Assuming that copy spell-out is determined *after* m-merger, then an incorporated object *must be spelled out*. However, if this object is part of a movement chain, then higher copies may be deleted in accordance with Economy of Pronunciation. This is schematized below:

(8)

Below, I apply this system to the passivization and relativization of incorporated objects, which take place even though the object is spelled-out within the verb complex.

4.2 Passives

Inuktitut passives involve A-movement of the thematic object to subject position. The passivized nominal triggers subject ϕ-agreement and can bind subject-oriented anaphora, (9).

(9) **nutarait**   suak-ta-u-lauq-**tuit**   angajuqa-**mi**-nut
     child.PL.ABS scold-PASS.PART-be-PST-3P.S parent-POSS.REFL-ALL
     'The children$_i$ were scolded by their$_i$ parent(s).'

Crucially, as first observed by Johns (2009), *incorporated objects may also be passivized*, as reflected by passive morphology on the verb. When passivized, they behave just like non-incorporated nominals with regards to agreement and binding. This suggests that these nominals have undergone A-movement, despite surfacing in the verb complex.

(10) a. **ujami**-<u>liuq</u>-ta-u-**juit**   Suusa-mut
          necklace-make-PASS.PART-be-INTR.3P Susan-ALL
          'The necklaces are being made for Susan.'

      b. **aasiva**-<u>tuq</u>-ta-u-juq   nulia-**mi**-nut
          spider-consume-PASS.PART-be-3S.S mate-POSS.REFL-ALL
          'The spider$_i$ is being eaten by its$_i$ mate.'

This conclusion is easily derived from the conditions on copy spell-out outlined above. Because the base-generated copy undergoes m-merger with the light verb, it must be spelled out in accordance with P-recoverability; the higher movement copy is deleted to satisfy Economy of Pronunciation.

4.3 Relative clauses

The interaction between NI and relative clause (RC) formation provides an additional, though more nuanced, argument for the present proposal. In non-incorporating contexts, relativized arguments in Inuktitut often appear *external* to the RC. In (11) for instance, the morphological case on the relativized argument (MOD) corresponds to its position in the matrix clause; the RC-internal pivot is always ABS (see footnote 3).

(11) kapi-si-juq **nanur-mit** [$_{RC}$ (_) Jaani-up taku-janga]-nit
      stab-AP-3S.S p.bear-MOD   (ABS) Jaani-ERG see-3S.S/3S.O-MOD
      'She stabbed the polar bear that Jaani saw.'

However, the surface position of the relativized object also depends on the *incorporating properties of the matrix and embedded verbs*. As illustrated with the minimal pair below, if the matrix verb is incorporating, then the object must surface within the matrix verb

complex, (12a); if the embedded verb is incorporating, then the object must surface within the RC, (12b). Finally, if both verbs are incorporating, then the object must appear in both positions, (12c).

(12)   a.   **tii**-<u>tu</u>-ruma-junga   [*RC* igvit   niuvi-lauq-tanga]-nit
            tea-consume-want-1S.S   2S.ERG buy-PST-3S.S/3S.O-MOD
            'I want to consume (i.e. drink) the tea that you bought.'

       b.   imi-ruma-junga [*RC* igvit   **tii**-<u>taa</u>-ri-lauq-tanga]-nit
            drink-want-1S.S   2S.ERG tea-get-TR-PST-3S.S/3S.O-MOD
            'I want to drink the tea that you got.'

       c.   **tii**-<u>tu</u>-ruma-junga   [igvit   **tii**-<u>taa</u>-ri-lauq-tanga]-nit
            tea-consume-want-1S.S   2S.ERG tea-get-TR-PST-3S.S/3S.O-MOD
            'I want to consume (i.e. drink) the tea that you got.'

Thus, like A-movement in passive constructions, copy deletion in Ā-movement is bled by m-merger. In (11), the copy that does not undergo m-merger is deleted. However, in (12), the m-merger of both movement copies yields multiple copy spell-out.

As further evidence for this approach, we can independently demonstrate that incorporated objects that appear RC-internally nonetheless take *RC-external scope*. In true internally-headed RCs across languages, relativized arguments are interpreted inside of the RC, as most clearly seen when the argument is modified by a quantifier (e.g. Shimoyama 1999, Hastings 2004, Bogal-Allbritten & Moulton 2017). This is illustrated with Japanese, in which internally- and externally-headed RCs yield different interpretations:

(13)   *Japanese; Shimoyama (1999):*

       a.   Taro-wa [[Yoko-ga   reezooko-ni   **kukkii-o   hotondo**
            Taro-TOP   Yoko-NOM refrigerator-NI cookie-ACC most
            irete-oita]-no]-o   paatii-ni   motte itta
            put-AUX-NM-ACC party-LOC brought
            'Yoko put most cookies in the refrigerator and Taro brought them to the party.'
            (IHRC)

       b.   Taro-wa [[Yoko-ga   reezooko-ni   irete-oita] **kukkii-o   hotondo**]
            Taro-TOP   Yoko-NOM refrigerator-NI put-AUX   cookie-ACC most
            paatii-ni   motte itta
            party-LOC brought
            'Taro brought most cookies that Yoko had put in the refrigerator to the party.'
            (EHRC)

Now, consider the Inuktitut examples below. The sequence in (14a-b) should be contradictory if *atausituaq ujamik* 'only one necklace' were interpreted inside the RC (#'David bought a necklace that Carol made only one of'). However, (14b) is felicitous given the context, revealing that, despite surface appearances, this RC is underlyingly head-external.

(14)   *Context provided:* Carol made five necklaces to sell, but Taiviti bought only one of them.

    a.   Kiuru   tallima-nik ujami-<u>liu</u>-laur-mat   takkua
          Carol.ABS five-PL.MOD necklace-make-PST-CAUS.3S.S DEM.PL.ABS
          tamarmik niuviaksa-ri-laur-tangit
          all.ABS   for.sale-TR-PST-3S.S/3P.O
          'Having made five necklaces, Carol had them all for sale...'

    b.   kisiani Taiviti-up niuvi-lauq-tanga   [Kiuru-up **atausi-tuaq**
          but   David-ERG buy-PST-3S.S/3S.O Carol-ERG one-only.ABS
          ujami-<u>liu</u>-lauq-tanga]
          necklace-make-PST-3S.S/3S.O
          '...but David bought only one necklace that Carol made.'

This is suggestive of a raising or matching analysis of RCs (e.g. Kayne 1994, Bhatt 2002, Hulsey & Sauerland 2006, Deal 2016), rather than a null operator analysis; the RC must contain full copies of the relativized argument, since they may be overtly pronounced when conditions on copy spell-out permit.

5.   Discussion: Implications for polysynthesis

I showed that obligatory NI in Inuit is due to m-merger between a v^0 and its object. This analysis is extendable to polysynthetic word formation in Inuit more generally: all adjacent elements in a clause undergo m-merger, in a *top-down* direction, until a head undergoes m-merger with a lexical root. This satisfies the Inuit wordhood requirement that all words begin with root material at their left edge (cf. Johns 2007).

(15)
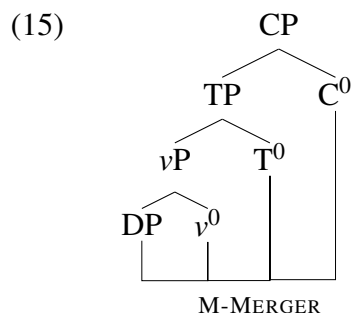
This system moreover suggests that m-merger applies between *linearly adjacent* elements, not structurally adjacent elements; because Inuit is right-headed with left-branching specifiers, this would preclude nouns in specifier position from being incorporating into the verb complex (capturing the fact that only direct objects—complements—even undergo NI).

    Finally, this analysis contrasts with recent phonological approaches to polysynthetic word formation (Compton & Pittman 2010, Barrie & Mathieu 2016), despite some apparent similarities. Such approaches take syntactic phases (CPs, DPs) in polysynthetic languages like Inuit to be mapped to single phonological words, so sub-phasal elements are spelled

out as bound morphemes. However, this incorrectly predicts that case-receiving DPs should never be able to undergo NI, contrary to fact. Moreover, it cannot capture the distribution of syntactic copies in incorporation contexts.

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