Headless Relative Clauses In Irish *

1. Introduction

Modern Irish (Celtic, VSO order) has received a fair amount of attention since the beginning of generative grammar, due to the unique features of its relativization constructions; its use of different preverbal particles roughly corresponding to the wh-extraction/resumption distinction; and its iterative use of preverbal particles, which provides an empirical argument for the notion of *successive cyclicity* (McCloskey 1979 and thereafter). Nonetheless, there has been a serious gap in the descriptive paradigm of Irish relativization constructions: there have been no adequate theoretical or descriptive analyses of the *headless relative* (or *free relative*) *construction*, shown in (1).

(1) *Headless relative clauses in Irish*

a. Sin [$_{RC}$ a bhfuil __ agam].
that a^N be.PRES.DEP at.me
'That's (all) I have. (lit. that's (all) that is at me.)'
(Mac Mathúna and Ó Corráin 1997:361)

b. Tá an leabhar agam.
be.PRES the book at.me
'I have the book.' (lit. the book is at me.)

This paper addresses this topic with two specific goals in mind: to provide a descriptive analysis of headless relative clauses in Irish that is distinct from previous analyses of Irish relative clauses, and to provide an adequate theoretical analysis account of it. I claim that Irish headless

* ACKNOWLEDGMENT HERE

relative clauses are in fact Carlson's (1977) amount relative clauses, and that Irish, unlike many other languages, overtly signals the maximalization operator (in the sense of Grosu and Landman 1998).

This paper is organized as follows: in section 2, I provide a synopsis of relativization strategies in Irish (which readers familiar with Irish syntax may skip this sectionwish to skip). Section 3 deals with the first problem of Irish headless relative construction, the a^N-gap mismatch; I argue that headless relative clauses in Irish are derived by A'-extraction. In section 4, I further the analysis of extraction, taking McCloskey (2002) as a point of departure. In section 5, I argue on empirical grounds that Irish headless relative clauses are in fact *amount relatives*, which were first observed and studied by Carlson (1977), and I incorporate this argument into my analysis. Finally, section 6 concludes the paper.

Regarding the data in this work, please note the following. First, strings roughly corresponding to a relative CP are delimited by brackets: [$_{RC}$ …]. Second, gaps are indicated by an underline: __. Finally, the nominal component that appears before the clausal component is called the *head noun*(/*nominal*), and the term *relative clause* refers to the clausal component excluding the head nominal expression.

2. A Short Description of Irish Relativizing Particles

Before dealing with the headless relative clauses, let us briefly review some features of *headed* (restrictive/non-restrictive) relative clauses. Irish has a rich inventory of preverbal particles, all of which I assume occupy C^0, following McCloskey (2001). Their functions vary widely, and among them are the "relativizing" particles, a^L and a^N (McCloskey 1979). These relativizing particles are used not only in relative clauses, but also various A′-constructions, such as clefts,

wh-questions, and topicalizations. The distribution of the two particles is based roughly on the A′ strategy employed in the clause in which they appear: the wh-extraction strategy is marked by a^L, whereas resumption is marked by a^N.[1] Traditionally, the relative clauses marked by a^L are called *direct relatives* and the ones marked by a^N are called *indirect relatives*. Although these particles are homophonous, they have different phonological and morphological effects, suggesting that they are different morphemes (McCloskey 1979 and 2001; Oda 2011).[2] For expository purposes, we adopt McCloskey's (1979) orthographic convention: the superscripts ^{L}, which stands for *Lenition,* and ^{N}, which stands for *Nasalization*, though these superscripts do not appear in actual Irish orthography.

(2) Wh-extraction and Resumption in Irish (McCloskey 1979:6)

a. *Wh-extraction with gap*
an scríbhneoir [$_{RC}$ a mholann na mic léinn __]
the writer a^L praise the.PL students
'the writer whom the students praise'

b. *Resumption*
an scríbhneoir [$_{RC}$ a molann na mic léinn é]
the writer a^N praise the.PL students him
'the writer whom the students praise'

Lastly, consider the non-A′ complementation particle: the particle *go* (*gur* in the past

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[1] This statement is not uncontroversial. See Noonan (1997, 2002) and Duffield (1995) among others for alternative views of these particles.

[2] For example, the two particles cause different types of consonant mutation on the following word. The extraction particle a^L causes lenition (i.e., spirantization/fricativization) of the initial consonant of the following word, while the resumption particle a^N eclipses (i.e., voices or nasalizes) it. Also, a^N has a past/non-past distinction, while a^L does not.

tense) marks complementation of a finite clause with no instance of A′-operation.

(3) Deir sé [$_{CP}$ go bhfuil an aimsir go hiontach anois].
says he *go* is.DEP the weather wonderful now
'He says that the weather is wonderful now.'

These three particles for wh-extraction, resumption, and non-A′ finite complementation are glossed as a^L, a^N, and *go* respectively in this paper.

3. Headless Relative Clauses in Irish: Extraction or Resumption?

3.1. Particle-Variable Mismatch

The first property of the Irish headless relative clauses that we are looking into is that the a^N particle appears in headless relatives even though the variable site is a gap, not a resumptive pronoun.

(4) a. D'ól sé [$_{RC}$ **a** bhfuair sé __].
drank he ***a*^{N}** got.DEP he
'He drank all he got.' (Christian Brothers 1999:145)

b. Caithfidh mé [$_{RC}$ **a** bhfaighidh mé __ uaidh].
will.spend I ***a*^{N}** will.get I from.him
'I will spend all I'll get from him.' (Mac Congáil 2004:181)

3.2. Headless Relative = Extraction

There are two possible explanations for the combination of the gap in the variable site and the a^N particle, which is otherwise used for resumptive structures. In the first one, which we will call the *resumption hypothesis*, the a^N particle in a headless relative is the resumptive marker a^N, but the gap is not really a gap, meaning that headless relatives are a sub-type of resumptive

construction. The other possibility is the *extraction hypothesis*, which takes the stance that the gap in the headless construction is indeed a gap produced by movement, and thus the particle a^N is different from the one in resumptive clauses. In this hypothesis, the headless construction is derived by a movement operation. In this section, I provide three arguments in favour of the extraction hypothesis.

3.2.1. Argument 1: Intermediate particle with long distance A′-dependencies

The first argument in favour of the extraction hypothesis comes from the patterns of "super-long" A′-dependencies, in which there is an intervening CP layer between the topmost particle and the variable site. The two patterns of long-distance "mixed" A′-operations in (5) are far more common than the others (though other patterns are also attested).

(5) *Common long-distance A′-dependencies*

a. [a^L … [a^L … $\_\_{}_{gap}$ …]]

b. [a^N … [*go* … pronoun …]]

The pattern shown in (5a) has a gap in the variable site, and a^L appears at each finite clause edge, which has been regarded as overt marking of successive-cyclicity of wh-movement. On the other hand, the pattern in (5b) is the typical case of resumption. The topmost preverbal particle is a^N, and *go* occupies each C^0 between the topmost a^N and the resumptive pronoun.

From this, we can make the following predictions: If the particle in the lower C^0 position of the headless relative construction is realized as *go*, then the construction is akin to the resumptive relative construction. If, on the other hand, a^L appears in the lower C^0, then the headless relative is driven by genuine displacement of an A′-item. We observe that a^L is the most common item found in the intermediate C^0 position in headless relative clauses, as shown in (6), suggesting that these clauses are derived by extraction.

(6) *Headless relative with long distance A'-dependencies*

a. Iarrfaidh Seán gach [$_{RC}$ a gcreideann sé [$_{CP}$ **atá** __ agat]].
will.ask Seán every a^N believes he $\boldsymbol{a^L}$.is at.you
'Seán will ask all that he believes that you have.'

b. [$_{RC}$ a raibh ráite leis [$_{CP}$ a bhí __ le feiscint]]
a^N was said with.him a^L was to.be.seen
'everything that he had been told was to be seen' (McCloskey, p.c.)

c. Achan duine [$_{RC}$ dá measann tú [$_{CP}$ **a** bhéas __ úsáideach agat]]
every person of.a^N think you $\boldsymbol{a^L}$ will.be.REL useful at.you
'every one of (all of) those that you think will be useful to you.' (McCloskey, p.c.)

3.2.2. Argument 2: Highest Subject Restriction

Resumptive relative clauses in Irish obey the "Highest Subject Restriction" (HSR) (McCloskey, 1990:210), which states that "a resumptive element may not be the 'highest' subject of the relative clause it is in." Thus, sentence (7a) is ruled out because the resumptive pronoun *sé* 'he' is the highest subject. As (7b) illustrates, a resumptive pronoun may occupy any other subject position.

(7) *Highest subject restriction*

a. * an fear [$_{RC}$ a raibh **sé** breoite]
the man a^N was **he** ill
'the man that (he) was ill'

b. an t-ór seo [$_{RC}$ a chreid corr-dhuine [$_{CP}$ go raibh **sé** ann]]
the gold this a^N believed a.few.people *go* was **it** there
'this gold that a few people believed (it) was there' (McCloskey 1990:(29–30))

Now let us consider the headless relative clause. If the headless construction is derived through resumption, it should obey the HSR. However, the data in (8) show that it does not, supporting the extraction hypothesis.

(8) *No HSR with the gap of the headless relatives*

a. Sin [$_{RC}$ a bhfuil __ agam].
that a^N be.PRES.DEP at.me
'That's (all) I have.' (Mac Mathúna and Ó Corráin 1997:361)

b. gach aon rud [$_{RC}$ ar thárluigh __]
every one thing a^N.PAST happened
'every single thing that happened' (McCloskey, p.c.)

3.2.3. Argument 3: Dialectal Variation

McCloskey (2002:207) points out that "Munster varieties and some southern Connacht varieties use the "default" complementizer *go*, instead of a^N, in resumptive structures."

(9) *Dialectal Difference: Choice of complementizer*

a. *Munster*
an fear [$_{RC}$ **go** rabhas ag caint leis]
the man *go* was.1sg talking with.him
'the man that I was talking to' (McCloskey, p.c.)

b. *Ulster*
an fear [$_{RC}$ **a** raibh mé ag caint leis]
the man a^N was I talking with.him
'the man that I was talking to' (McCloskey, p.c.)

Very crucially, McCloskey also notes that "these varieties have a^N […] in headless relatives", and thus the complementation particle *go* cannot be used in the construction in these varieties (2002:207).

(10) *Headless relative clause in southern varieties*
Bhí [$_{RC}$ a raibh __ san Oileán] ag féachaint ar na naomhóga.
was a^N was.DEP in.the Island look.PROG on the currachs
'Everyone who was in the Island was watching the currachs.' (McCloskey 2002:(55a))

If the a^Ns in the headless relative and the resumptive relative are identical, the Munster headless relative would be formed with *go* as well. This is not the case, suggesting that the headless

relative differs from the resumptive relative.

My three arguments in favour of the extraction hypothesis are summarized in (11) below:

(11) *Summary of the three arguments*

	Extraction Relative with a^L	Resumption Relative with a^N	Headless Relative with a^N
Choice of Lower C^0s	a^L	*go*	a^L
Highest Subj. Restr.	not observed	observed	not observed
Munster Varieties	——	simplified to *go*	a^N retained

This evidence supports the extraction hypothesis, from which I conclude that the headless relative clause formed with the a^N particle and the gap involves extraction. This in turn means that the particle a^N of the headless relative clause is different from that of the resumptive relative. Thus, this conclusion leads us to postulate two separate instantiations of the a^N particle: a^{NRes} for resumptive relatives, and a^{Nhl} for "headless" relatives. This raises a new issue: What exactly do we mean by "extraction"? What differences do we observe between a^{NRes} and a^{Nhl}?

4 Analyses of Wh-extraction Relativization: An Excursion

Before exploring this issue, let us briefly review the theoretical status of relative clauses and the analysis of Irish restrictive relative clauses.

4.1 How to Derive a (Restrictive) Relative Clause

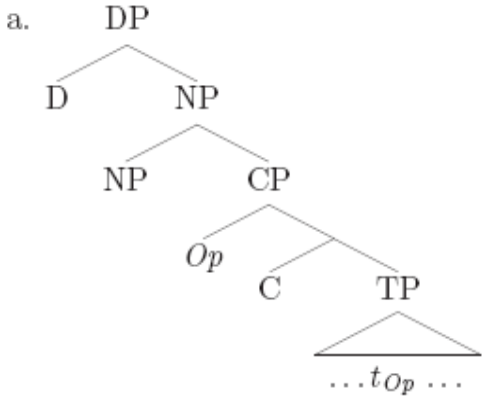
First, let us consider what it means to derive a relative clause by *wh-extraction* in the current theoretical context.[3] There are two major approaches within the minimalist literature; *adjunction*

[3] For a comprehensive summary of treatments of relative clauses in generative grammar, see Bianchi (2002a,b).

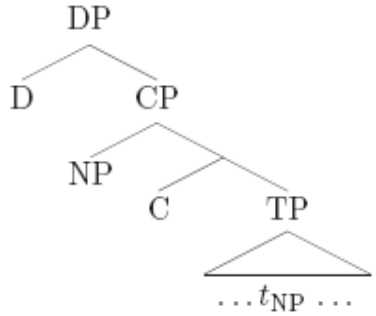
(also called *matching*) *approach*, and *raising approach*.

(12) Adjunction (a.k.a. Matching) Approach and Raising Approach

a.



b.



The adjunction analysis shown in (12a) takes the relative CP to be an adjunct of the head noun, thus treating the relative CP like other modifiers, such as adjectives or non-complement PPs. A phonologically null *operator* is base-generated in the variable site within the relative clause, and then it moves to Spec-CP.[4] In the raising analysis, as illustrated in (12b), on the other hand, the

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Also see Kayne (1994), Bianchi (1999), Bhatt (2002), de Vries (2002), Hulsey and Sauerland (2006), and Henderson (2006) for detailed discussions. See Borsley (1997, 2001) for criticisms of the raising analysis.

[4] Note that recent ramifications of the adjunct analysis try to do away with the operator; instead, a phrase identical to the head nominal is base-generated in the variable position and it moves to Spec-CP. This phrase is then deleted upon *matching* with the head nominal at PF. However, I assume in this work that the operator is at work

head nominal phrase directly moves to Spec-CP, and thus the structure is not mediated by an operator. The grammatical dependency of the head nominal and the relative clause is also treated differently under this analysis: the head noun phrase is a specifier of the relative CP, and thus the relative "clause" alone does not form a maximal projection.

Although there have been attempts to provide a unified theory of relative clauses (e.g., Henderson 2006), I assume that both approaches to derive relative clauses are available by default, following Aoun and Li (2003) and Hulsey and Sauerland (2006).

Hulsey and Sauerland (2006) provide the following pieces of evidence to defend their claim that both strategies are available. First, it is known that an anaphor may occur within the head nominal phrase while its binder remains within the relative clause:

(13) I saw the [pictures of *himself*$_i$] [$_{RC}$ that John$_i$ liked __].

The adjunction analysis cannot explain the grammaticality of (13), as it predicts that the anaphor *himself* would remain unbound. The raising analysis readily accounts for (13): a copy of the head nominal phrase *picture of himself* occupies the gap position, and the anaphor is locally bound by its antecedent *John*. However, the raising analysis cannot account for the following:

(14) I saw the [pictures of John$_i$] [$_{RC}$ that he$_i$ liked __].

Sentence (14) is acceptable, but the raising analysis predicts that the lower copy of *John* is bound, and thus violates Condition C. The adjunction analysis, on the other hand, accounts for this with no problem, as an item distinct from (a copy of) the r-expression *John* occupies the gap position, and thus it is free. Finally, there is a correlation between the type of relativization

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in a restrictive relative clause formed by the adjunction analysis. See Hulsey and Sauerland (2006) and works cited therein for more on this.

analysis and availability of extraposition of the relative clause:

(15) a. I will see the [pictures (of John$_i$)] *tomorrow* [that he$_i$ likes __]

b. *I will see the [pictures of himself$_i$] *tomorrow* [that that John likes __].

Following Fox and Nissenbaum (2000), Hulsey and Sauerland (2006) argue that (15a) is derived by rightward Quantifier Raising of the head noun phrase with counter-cyclic merger of an adjunct. the ungrammaticality of sentence (15b) comes from the tension between the two analyses: the presence of an anaphor bound by an antecedent within a relative clause triggers raising, and hence it forces the relative clause to be a non-adjunct, while the extraposition forces the relative clause to be an adjunct, hence forcing the head nominal phrase to be base-generated at the surface position.

4.2 Starting Point for an Analysis: McCloskey (2002)

Let us consider next how Irish relative clauses have been analyzed. My analysis of the headless relative clause takes McCloskey (2002) as the point of departure, which we review briefly here.

The main thrust of McCloskey's analysis is that extraction corresponds with a^L and resumption corresponds with a^N. Several theoretical assumptions are made in order to implement this intuition. First, as mentioned earlier, it is assumed that preverbal particles, including a^L, a^N (in a resumptive structure or in a headless relative), and *go*, occupy a C^0 position, and at most one particle may appear in the preverbal position.

A'-dependencies are induced by two formal features: [EPP], which requires a grammatical element to occupy its specifier position, and [Op(erator)], which agrees with an operator in its probe domain. The extraction particle a^L has both [EPP] and [Op], while the

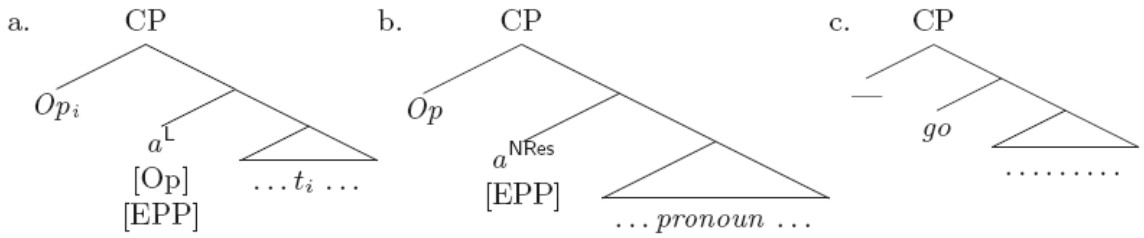
resumption particle a^{NRes} has only [EPP], and the complementation particle *go* has neither:[5]

(16) a. ⟨ a^L ↔ [EPP], [Op] ⟩ (Wh-extraction)
b. ⟨ a^{NRes} ↔ [EPP] ⟩ (Resumption)
c. ⟨ *go* ↔ ∅ ⟩ (Complementation)

The feature [Op] of a^L agrees with Op in the variable position and its [EPP] feature moves an operator *Op* to Spec-CP position. Together these two features trigger movement of an operator. As in all instances of A'-movement, subjacency is respected; the operator has to land in each Spec-CP if it has to move across a CP layer. This accounts for the multiple occurrence of a^L, discussed in (5a).

The resumption particle a^N has the feature [EPP], which requires something to be merged, but since there is no feature inducing Agreement, the [EPP] feature alone forces External Merge. The external merger with *Op*, and not with any other item, and the A'-dependency with *Op* and the resumptive pronoun is guaranteed on semantic grounds after narrow syntax; merger with any other item will result in a semantically incomputable logical form. Since resumption involves no movement, if the A'-dependency between the operator *Op* and the resumptive pronoun that *Op* binds is established across CPs, the complementation particle *go*, which lacks any A′-property, appears in heads of lower CPs, accounting for the pattern described in (5b).

(17)



[5] Of course, there are more than these A'-related features. For example, these three particle appear in finite context, which suggests they have a feature [finite]. I omit these ancillary elements for the sake of simplicity.

4.3 Status of Raising Analysis in Irish

Crucially, McCloskey (2002) does not take the possibility of a raising analysis for Irish relative clauses into consideration. Thus, we should first inquire whether the raising analysis is necessary in Irish. My answer to this question is *yes*: a reciprocal element in the Irish extraction relative clause may appear within the head nominal phrase, while its lower copy is bound by an antecedent.[6]

(18) Chonaic mé gach [pictiúr **dá chéile**$_i$] [$_{RC}$ a ghlac siad$_i$ __].
saw I every picture of.each.other a^L took they
'I saw every picture of each other that they took.'

If we assume that the adjunction analysis with mediation by the operator is the only analysis available for the Irish extraction relativization, then an anaphoric item may not appear within the head nominal phrase, and hence sentences such as (18) would be ungrammatical. The grammaticality of the sentence in (18) suggests (to the extent that Binding Theory is construed configurationally) that the raising analysis is available in Irish as well. Also, it should be mentioned that a^L appears in a structure where raising is motivated. Two conclusions are drawn from this observation: First, McCloskey's (2002) characterization of a^L as [EPP] plus [Op], although intuitive, is not entirely accurate. In particular, the characterization of the agreement feature [Op] is too narrow, in that it can agree with other items, including nominal phrases, as in (18).[7] I propose that a^L consists of [EPP] and [Agr], which agrees with an A'-marked constituent.

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[6] Modern Irish differs from Scottish Gaelic in this regard; Adger and Ramchand (2005) report that SG does not allow A′-reconstruction.

[7] Note on this regard that a^L appears in the cleft construction, which we may take an instantiation of focusing, as

Another conclusion is that it is not possible to explain the distribution of a^{L} and a^{Nhl} in terms of the adjunction/raising dichotomy.

Note that the raising analysis by itself is insufficient. Extraposition is possible in Irish as well, as shown in (19).[8]

(19) Tífidh mé na [grianghraif] **amárach** [$_{RC}$ a ghlac siad __ i nGaoth Dobhair anuraidh].
see.fut I the pictures tomorrow a^{L} took they in Gweedore last.year
'I will see the pictures tomorrow that they took in Gweedore last year.'

The relative clause and the head nominal are segregated by a temporal adjunct *amárach* 'tomorrow,' which is semantically associated with the matrix verb *tífidh* 'see.fut'. The raising analysis assumes that the relative clause and the head nominal are in a head-argument relation, and hence the clausal part cannot extrapose. The fact that the relative clause can extrapose, as in (19), confirms that the adjunction analysis is available in Irish. If the head nominal phrase contains an anaphor whose antecedent is within the relative clause, the sentence becomes far less acceptable, as in (20).

(20) ?? Tífidh mé na [grianghraif *dá chéile*$_{i}$] **amárach** [$_{RC}$ a ghlac siad$_{i}$ __ i nGaoth Dobhair anuraidh].
see.FUT I the pictures of.each.other tomorrow a^{L} took they in Gweedore last.year
'I will see the pictures of each other tomorrow that they took in Gweedore last year.'

The unacceptability of (20) is explained as a double-bind between the two analyses of relativization, as in Hulsey and Sauerland's (2006) analysis of the English patterns, suggesting

well as in topicalization, and, interestingly, non-nominal constituents, may be fronted in these cases.

[8] One of my consultants does not find (20) completely ungrammatical, but reports that it has 'a slight edge'.

that the two methods of extraction relativization are available in Irish as well.

4.4 a^{Nhl} in a Headless Relative Clause and the Feature [Op]

Let us now come back to the Irish headless relative clause. Something must undergo A′-movement from the variable position to a higher structural position in a headless relative clause. Let us assume that a^{Nhl} in a headless relative has some feature α, which agrees with [EPP] and with whatever moves. What is α? If α is a property of the moved element then we should expect a full parallel between ordinary relative clauses and headless relative clauses. That is, headless relative clauses should have a^{Nhl} in all C^0 heads between the highest C^0 and the gap, as in (21), just as ordinary relative clauses have a^L in all C^0 heads, as in (22):

(21) [a^{Nhl} … [a^{Nhl} … [a^{Nhl} … __ …]]]
(22) [a^L … [a^L … [a^L … __ …]]]

However, this is not what we find. Just as ordinary relative clauses have a^L in all C^0 s between the head and the gap, a^L appears in the lower C^0's in headless relative clauses.

(23) Iarrfaidh Seán gach [$_{RC}$ a gcreideann sé **atá** __ agat].
will.ask Seán every a^N believes he ***a*^{L}**.is at.you
'Seán will ask all that he believes that you have.'

The difference between a^L and a^{Nhl} is therefore not in the nature of the moved element, but at the top of the chain. Thus, the headless relative clause particle a^{Nhl} consists of three (or more) features; [EPP] and [Agr], like a^L, and some third element unique to a^{Nhl} distinct.

(24) a. ⟨ a^L ↔ [EPP], [Agr] ⟩ (Wh-extraction)
b. ⟨ a^{Nhl} ↔ [EPP], [Agr], ??? ⟩ (Headless Rel)

What is this third element? I address this in the following section.

5 Irish Headless Relatives are Amount Relatives

I argue in this section that the Irish headless relative clause is in fact an amount (or degree) relative clause, as in Carlson (1977). Formally, I propose that the form a^{Nhl} of headless relative clauses is a morpho-phonological instantiation of [EPP], [Agr], and the Maximalization operator proposed by Grosu and Landman (1998).

5.1. What is an Amount Relative?

The core property of amount relatives is that they denote an amount/degree rather than an individual. The data in (25) and (26) show amount relatives in English:

(25) a. Every man there was __ on the life-raft died.
b. *Some man there was __ on the life-raft died.
c. Marv put [everything (that) he could __] in his pockets. (Carlson 1977:(6), (17))

(26) a. It would take a month to drink [the whiskey that we spilled at the party].
→ The amount of whiskey relativized
b. It took a month to drink [the whiskey that we spilled at the party].
→ The actual whiskey relativized

In (25a), relativization has taken place from a *there*-existential clause. This is unexpected, since the gap site in this construction corresponds to an NP, while in ordinary restrictive relatives the variable site corresponds to a full DP. (25c) is an example of an ACD-relative.[9] Very notably, the sentence in (25c) has a comparative-like reading, meaning "Marv put as many things as he could put in his pocket," rather than an ordinary universal quantifier meaning "if Merv was able to put anything in his pocket, he then put it." The sentence in (26a) is an instance of a "modal" relative

[9] Note that Carlson (1977) does not refer to these as ACD-relatives, as the term *antecedent contained deletion* was not yet in use.

(Heim 1987), which has a pure degree(/kind) reading. The most salient reading of (26a) relativizes the *amount* of whiskey, but not the actual referent. This pure amount reading often, if not always, requires the presence of a modal element, and thus we observe a stark contrast with (26b). Finally, these relatives appear to have a strong association with the semantic notions of universality and/or exhaustivity. Thus, the existential quantifier *some* cannot appear with *there*-relatives, as illustrated in (25b).

5.2 A Formal Analysis (Grosu and Landman 1998)

Let us consider how amount relatives can be accounted for formally. The most widely known analysis is that proposed by Grosu and Landman (1998).[10] Grosu and Landman observe the following two points: First, there is a common intuition that while amount relatives are relativizations over degrees, more than just the degree is relativized. Consider the sentence in (26a). It cannot mean: "We spilled a certain amount of whiskey. It would take a month to drink the same amount of something or other." Thus, the sortal (i.e., NP) associated with the degree notation (whiskey in (26a)) must be shared by the predicate inside the relative clause and the one taking the relative as an argument. Secondly, the *there*-relatives do not induce an identity-of amount reading; for example, the sentence in (25a) does not mean "the same number of men as there were on the life-raft died."

In order to account for these observations, Grosu and Landman first propose that the semantics of *degree* is complex: while classical degree notation consists of cardinality alone, they argue that the expression of degree for a given sortal predicate (that is, a nominal expression) is a triplet consisting of a plural index, the cardinality of the index, and the sortal, as exemplified in

[10] But see a critical review by Herdan (2008).

(27):

(27) *Complex Degree*

⟨ |x|, SORTAL, x ⟩

cardinality *sortal* *index*

Amount relativization is taken as relativization of a degree expression, and wh-extraction corresponds with abstraction over degree in semantics. Thus, for the phrase *(the) books (that) there are on the table*, we obtain the set-theoretic representation in (28):

(28) a. *books (that) there are on the table*

b. {⟨|x|, BOOKS, x⟩ : BOOKS(x)&ON-THE-TABLE(x)}

(Grosu and Landman 1998:(19))

Consider a context where there are two books, book a and book b, on the table. Under this scenario, (28) looks like (29):

(29) *Context: Two books, a and b, are on the table*

{⟨1, BOOKS, a⟩, ⟨1, BOOKS, b⟩, ⟨2, BOOKS, a ⊔ b⟩}

(Grosu and Landman 1998:(21))

It has been further observed that an arbitrary degree cannot be randomly selected from the set produced by an amount relative, and that only a universal or definite determiner can go with amount relatives (e.g., (25a)) (Carlson 1977). Thus, in order to account for these observations, the maximalization operator MAX is introduced.[11] This operator takes a CP, which is a set of complex degrees, as its argument, and picks the unique maximal degree from the set created by degree relativization. If there is no such unique maximal degree, the application of the maximalization operator will be undefined. Application of the set of degrees in (29) to the

[11] See Rullmann (1995) for an excellent comprehensive survey of maximalization.

maximalization operator yields (30):

(30) MAX((29)) = {⟨2, BOOKS, a ⊔ b⟩}
The amount relative CP may undergo an optional operation of SUBSTANCE.

(31) SUBSTANCE(CP) = {x : ⟨|x|, P, x⟩ ∈ CP}

Recall that extraction from *there*-existentials does not induce relativization of amount/degree. The SUBSTANCE operation does this work: it provides the individual denotation from the complex degree notation. It is assumed to apply by default; the individual reading of an amount relative seems to be always available whereas the amount reading is not.[12]

5.3 Irish Headless Relatives are Amount Relatives

In this section I argue from an empirical ground that the Irish headless relative clause is an amount relative.

5.3.1. Universality/Exaustivity

The first argument concerns *universality/exhaustivity*. It has been noticed that Irish headless relatives always invoke a universal/exhaustive interpretation. This is exemplified by all the examples of Irish headless relative clauses in this work. Similar observations have been made of English headless relative clauses (e.g., Jacobson 1995, van Riemsdijk 2006), but in Irish this property is more salient; Irish allows the universal quantifier *gach* to directly quantify a headless

[12] The SUBSTANCE operation is controversial. Herdan (2008) observes it is unclear what makes *there*-relatives obligatorily undergo the operation while it is optional in other cases. Similarly, von Fintel (1999) raises a concern that the operation seems to overgeneralize, since *as-many-as* comparatives, which also rely on the degree expression, have only the identity of amount reading, despite the allegedly default nature of the SUBSTANCE operation.

relative clause. Note also that there is no weak quantifier that can directly modify headless relative clauses.[13]

(32) a. **gach** [$_{RC}$ a gcuala mé]
every a^N heard I
'everything I heard' (McCloskey, p.c.)

b. **gach** [$_{RC}$ ar ól mé]
every a^N.past drank I
'all I drank' (Mac Congáil, 2004:181)

c. **gach** [$_{RC}$ a bhfuil __ de thithe ar an mbaile]
every a^N be.pres.dep of houses on the town
'all that there were of houses in the town' (McCloskey, p.c.)

5.3.2. Extraction of Sub-DP Constituent

Second, the Irish headless relative construction allows extraction of a sub-DP constituent, unlike regular restrictive extraction relative clauses. That is, the gap site of the headless relative

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[13] There are apparent counterexamples with non-universal quantifiers such as *bunús* 'most' or *leath* 'half':

(i) a. bunús [$_{RC}$ a bhfuil __ a dhíobháil ort]
most a^N be.pres.dep needed on.you
'most of what you need' (McCloskey, p.c.)

b. leath [$_{RC}$ a raibh __ tuillte aici]
half a^N be.pres.dep deserved at(/by).you
'half of what you deserved' (McCloskey, p.c.)

However, these are not contradictory: these quantifiers take genitive arguments, as in (ii), and headless relatives can bear genitive, as (iii) shows. Thus, the sentences in (i) are partitive structures that are "delimited" by genitive, just like a partitive structure with the headless relative clause in (iv).

(ii) bunús/leath na hoibre
most/half the.GEN work.GEN
'most/half of the work' (cf., *an obair* 'the work.NOM') (McCloskey, p.c.)

(iii) Bhí súile [$_{RC}$ a raibh __ sa teach] air.
be.PAST eyes a^N be.past.dep in.the house on.him
'The eyes [of everyone who was in the house] were on him.' (McCloskey, p.c.)

(iv) some of the books that there were in the library

construction does not necessarily correspond to a full DP, as illustrated in (33):

(33) *Gap smaller than DP*

a. [$_{RC}$ a bhfuil [$_{DP}$ __ d'airgead] agam]
   a^N be.pres.dep of.money at.me
   '(all) of the money I have (lit. (all) of the money that is at me)'

b. Tá [$_{RC}$ a n-ólfaidh páistí [$_{DP}$ __ de bhaine]] maith acu.
   is a^N will.drink kids of milk good at.them
   'Every (litre of) milk kids drink is good for them.'

In the examples in (33), the substantive/sortal components are left stranded. Notice that the gap created by the headless RC extraction appears to correspond to a measurement or unit. I argue that sub-DP extraction shown in (33) is extraction from a pseudo-partitive structure, and I take the examples given in (33) as instances of measure phrase extraction from a pseudo-partitive structure (Schwarzschild 2006). The fact that ordinary pseudo-partitives appear to have a similar structure supports this claim.[14]

(34) *Pseudo-partitives in Irish*

a.		b.	
píosa d'arán	bhán	íotar de bhainne	gearr úr
piece of.bread	white	litre of milk	sour fresh
'a piece of white bread'		'a litre of fresh sour milk'	

There is also semantic evidence: Schwarzschild (2006) points out that the measure component of a pseudo-partitive structure is interpreted as a *monotonic* scale that tracks the part-whole relation of the substantive nominal. This aspect can be easily shown by simple arithmetic; addition and subtraction are possible with monotonic scales, but not with non-monotonic scales,

[14] There is a minor issue regarding alternation between genitive marking and the preposition *de* 'of'. This alternation is an phonological effect, driven by phonological weight.

(i) líotar bainne
litre milk.GEN
'a litre of milk'

as shown in (35):

(35) a. Monotonic: 6 litres of water + 3 litres of water = 9 litres of water
b. Non-Monotonic: 60-degree water + 20-degree water ≠ 80-degree water

Notice that *litre* (volume) is monotonic for the substantive *water*, and thus the (pseudo-)partitive is used, while *degree* (temperature) is not monotonic, and thus it cannot be expressed with the (pseudo-)partitive construction. Non-monotonic interpretation of the abstracted degree in the Irish headless relative construction is not available, suggesting the pseudo-partitive analysis.

5.3.3. Use of Mass/Plural Head Noun

Amount relatives (in English) normally require the head nominal to be mass or plural:[15]

(36) a. Those men (that) there were __ in Australia like Bob.
b. That meat (that) there was __ was soon eaten by the cougar.
c. * That man (that) there was __ in Australia likes Bob. (Carlson 1977:(14))

The headless relative construction is consistent with this pattern. Consider the sentences given in (37): the substantive/sortal component of a pseudo-partitive left stranded must be either mass or plural.

(37) a. * Sin [$_{RC}$ a bhfuil __ de chara agam]
that a^N is.dep of friend at.me
'That's all the friend that I have.' (count: singular)
b. Sin [$_{RC}$ a bhfuil __ de chairde agam]
that a^N is.dep of friends at.me
'That's all the friends that I have.' (count: plural)

[15] An amount relative may take a singular head nominal if it is put in a right context. Thus, Grosu and Landman (1998:149) report that the following is grammatical:

(i) I took with me the longest/second/only book that there was on the table.

c. * Sin [RC a bhfuil __ d'ubh agam]
that a^N is.dep of.egg at.me
'That's all the egg that I have.' (count: singular)

d. Sin [RC a bhfuil __ d'uibheacha agam]
that a^N is.dep of.eggs at.me
'That's all the eggs that I have.' (count: plural)

e. Sin [RC a bhfuil __ d'fheoil agam]
that a^N is.dep of.meat at.me
'That's all the meat that I have.' (mass)

f. Sin [RC a bhfuil __ de mhóin agam]
that a^N is.dep of peat at.me
'That's all the peat that I have.' (mass)

5.3.4. Split Nominal Head

We have seen in section 5.3.2 that extraction of a sub-DP constituent is possible with headless relative clauses in Irish, and I argue that extraction of an abstract measure component takes place in the relative clauses. In fact, the headless relative clause can have something that looks like a "head". Consider the examples in (38) below:

(38) a. Sin an [méid airgid] [RC atá __ agam].
that the amount money.gen a^L.is at.me
'That's the amount of money that I have'

b. ?* Sin an [méid] [RC atá __ d'airgead agam].
that the amount a^L.is of.money at.me
'That's the amount of money that I have'

c. ?* Sin an [méid airgid] [RC a bhfuil __ agam].
that the amount money.gen a^N is.dep at.me
'That's the amount of money that I have'

The examples in (38a) and (38c) show extraction of a full DP. The sentence in (38a) is acceptable as the ordinary wh-extraction particle a^L is used, whereas (38c) is unacceptable (or marginal at best) with the a^N particle. The ungrammatical (38b) shows extraction of a partial component of a

DP, which is overt, but with a^L. Very interestingly, this pattern becomes completely acceptable once the particle is changed to a^N:

(39) Sin an [méid] [$_{RC}$ a bhfuil __ d'airgead agam].
that the amount a^N is.DEP of.money at.me
'That's the amount of money that I have.'

The data in (38b) and (39) are very much like the headless relatives with a non-DP gap, such as the ones given in (37), except that they come with head nominals that denote an "amount".[16]

5.4 Putting it together

I have shown in section 3 that the Irish headless relative clause is derived by extraction, which then entailed that the a^Ns of headless relative clauses and resumptive relative clauses are different, despite their morpho-phonological similarities. In section 4, I argued that the same "agreement" feature is used the headless relative clauses and the ordinary relative clauses. Thus, the headless relative particle a^{Nhl} differs from the regular extraction particle a^L in that a^{Nhl} has one extra feature. In this section I argue that Irish headless relative clauses fit the definition of *amount relatives*, which may be formally expressed with a newly-introduced notion of complex

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[16] In fact, I have come across relative clauses which look like ordinary relative clauses, except that they accompany the a^N particle, and they reportedly have some distinct sense of universality.

(i) achan ceist ar cuireadh air sa rang
every question a^N put.AUT on.him in.the class
`every question that he was asked in class' (McCloskey, p.c.)

The ordinary extraction particle a^L can be easily substituted for a^N in (i) without altering the intended meaning. Cases like (i) are hard to deal with, since judgment varies across speakers, and in the case of spontaneous data, it is hard to tease apart if they are erroneous. I leave aside the cases like (i) for future research.

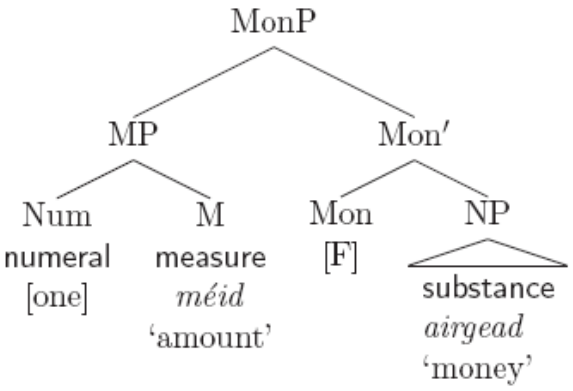
degree and the maximalization operator.

I propose that the morphology of the preverbal particle of the headless relative construction reflects the presence of the maximalization operator. Let us put the pieces together. I use the sentence in (40) for illustration:

(40) Sin [$_{RC}$ a bhfuil __ d'airgead agam].
that a^N is.dep of.money at.me
'That's all the money that I have.'

For the analysis of the pseudo-partitive construction, I adopt Schwarzschild's (2006) idea that pseudo-partitive phrases are mediated by a functional head Mon(otonicity).

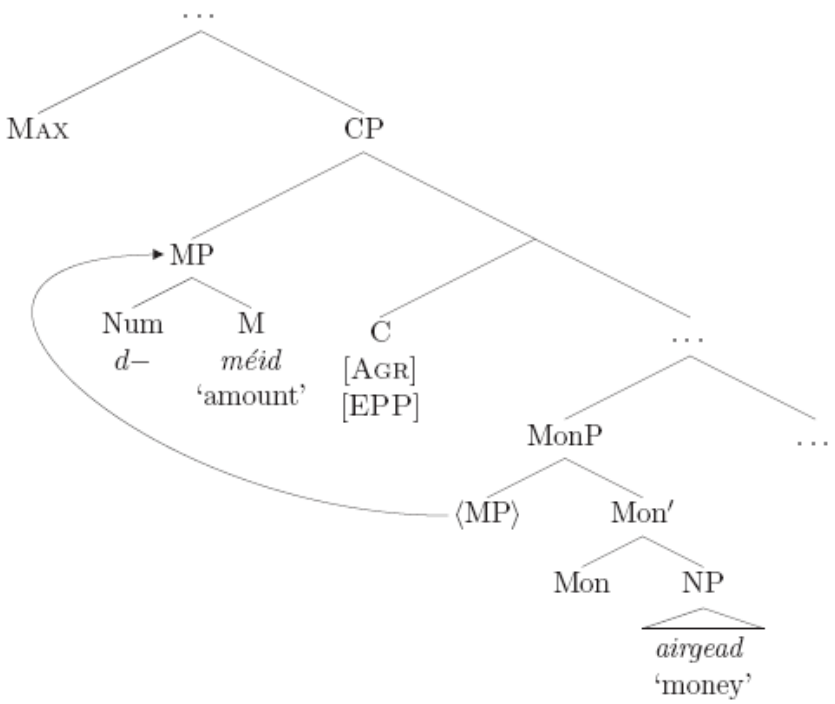
(41) *Structure of Partitive Phrase (based on Schwarzschild (2006))*



We have seen that in Irish headless clauses a sub-DP constituent may be extracted, as shown in (40). The extraction from the partitive targets the Measure Phrase, MP in (41), which I assume denotes a (complex) degree in the semantics. The movement of the measure component corresponds with abstraction over degree in the semantics, and thus the derived construct after movement denotes a set of degrees. The CP is then merged with the maximalization operator

MAX:

(42)



We have seen semantic evidence for the existence of MAX in Irish in sections 5.3.1 and 5.3.3. Subsequent application of the SUBSTANCE operation to this output seems to be the default in Irish as well, as the headless relative clauses in most cases refer to actual individuals. If SUBSTANCE is applied, it will once again denote a plural individual; if not, it will continue to denote a degree.

5. 4.1 Morphology of a^{Nhl}

Let us come back to the morphology of a^{Nhl}. I argue that a^{Nhl} is a morpho-phonological instantiation of the maximalization operator MAX in addition to the features [EPP] and [Agr], which would yield a^{L} on their own. This analysis accounts for the lack of a^{N} in intermediate C^{0}s. As headless relatives are derived by movement, the realization of the intermediate particle is explained as a straightforward instance of successive-cyclicity. The appearance of $a^{N(hl)}$ would

cause a crash in semantics; it implies premature application of the maximalization operator, rendering the rest of structure incomputable.

Finally, there is a glitch in the structure in (42) that needs to be addressed: MAX and the rest of the content in C^0 are split by the A′-moved head nominal. MAX and the content in C^0 may be completely disjoint when the structure is sent off to PF.

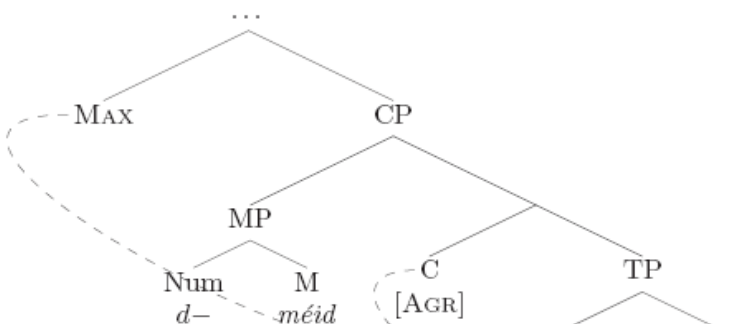
(43) Sin an MAX [méid] [$_{RC}$ a bhfuil __ d'airgead agam].
that the amount a^N is.dep of.money at.me
'That's the amount of money that I have'

How can we ensure that MAX is expressed in C^0? The simplest solution is to assume morphological lowering of MAX at PF. Indeed, McCloskey (1996) independently argues that the element on C^0 lowers to T^0 in order to account for the fact that adjuncts may precede C^0, although they modify lower elements:

(44) Deiridís **an chéad Nollaig eile** go dtiocfadh sé aníos.
they.used.to.say the first Christmas other *go* would.come he up
'They used to say that next Christmas he would come up.' (McCloskey 1996:(30))

Compare the Irish sentence and the English translation in (44). In Irish, the adjunct *an chéad Nollaig eile* 'next Christmas' modifies the embedded clause thought it appears before the complementizer particle. Such a pattern is disallowed in English (i.e., **They used to say* ***next Christmas*** *that he would come up*). McCloskey argues that Irish allows this pattern since the preverbal particle *lowers* from C^0 to T^0. I argue the same for the maximalization operator and provide the tree in (39) as the final picture of the analysis of headless relatives in Irish.

(45)



6 Conclusion

In this paper I have provided an analysis of Irish headless relative clauses, an empirical domain that has long been understudied. I have argued that headless relatives, which exhibit particle-variable site mismatch, are derived by extraction, and that they fall under the notion of Carlson's (1977) *amount relatives*. I adopt the formal analysis of the amount relatives developed by Grosu and Landman (1998), and I have claimed that the maximalization operator is overtly realized in headless relative clauses in Irish. Of course, there remain some outstanding issues: for example, why are the morphological forms of a^{Nhl} and a^{NRes} identical? Furthermore, Kotek (to appear) shows that Romanian seems to express the maximalization overtly. This calls for an analysis of amount relatives and the maximalization operator in a typological context. I leave these issues for future research.

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Abstract: This paper investigates headless (or free) relative clauses in Irish, which are not straightforwardly accounted for by previous analyses. Specifically, this paper argues that Irish headless relative clauses are derived by extraction, and not by resumption, and that they fall under the rubric of *amount relatives* (Carlson 1977, Grosu and Landman 1998). Adopting the formal approach of amount relatives proposed by Grosu and Landman (1998), I argue that the morphological oddities of the particle that appears in headless relative constructions reflects the existence of the maximalization operator.