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Indefinites and negative concord in Maltese: towards a dynamic account

Taqsira

Dan ix-xogħol jistħarreġ il-pronomi indefiniti u l-qbil negattiv fil-Malti mill-perspettiva tas-Sintassi Dinamika (SD). L-argument ewlieni hu li s-sistema tal-indefiniti fil-Malti nistgħu nispjegawha permezz tas-SD għax f'dan il-qafas l-interpretazzjoni tinbena b'mod inkrementali, frott il-karatteristika intrinsika tal-lessemi li jkunu sensittivi għall-kuntest. L-idea hi li 'n-indefiniti' bħal *xejn* mhumiex 'intrinsikament negattivi', imma jħaddnu restrizzjoni fuq l-għoqda propożizzjonali li taħkem il-binja li n-indefiniti jieħdu sehem fiha, b'tali mod li din l-għoqda trid tkun immarkata għan-negazzjoni. Dan l-immarkar iseħħ dment li ma jkunx hemm xi element ieħor li l-għoqda propożizzjonali jkun diġà mmarkaha.

1. Introduction

This article gives an account of the distribution and interpretation of negative particles and indefinite pronouns in Maltese within the framework of Dynamic Syntax, a grammar formalism which models the incremental construction of interpretation as utterances are produced and parsed in real time (Kempson et al. 2001, Cann et al. 2005).

The article is structured as follows. Section 2 gives an overview of the phenomenon of negative concord and a critique of existing analyses, while section 3 lays out the basic principles of Dynamic Syntax. Section 4 focuses on negation in Dynamic Syntax, dealing first with non-negative concord languages such as Standard English (4.1), then the core data on negative concord in Maltese (4.2). It then addresses the status of the problematic element *qatt* '(n)ever' (4.3), and one shortcoming of the account presented here (4.4). Section 5 concludes the article.

2. Negative concord

At least since Labov (1972), formal semanticists and syntacticians have wrestled with the problem of "negative concord". This label refers to the phenomenon whereby, in certain languages, two (or an even number of) apparently negative elements fail to cancel one another out when they co-occur in a clause.[1] This phenomenon may be observed in Maltese, where, for example, the indefinite pronoun *xejn*, usually translated with English ‘nothing’, as in (1b), results in a single logical negation in interpretation when combined with the preverbal negator *ma*, as in (1a).[2]

(1a) *It-tifla* *ma* *rat* *xejn.*
the-girl NEG see.PRF.3FSG n.thing
‘The girl didn’t see anything.’

(1b) *X’rat?* *Xejn!*
what-see.PRF.3FSG n.thing
‘What did she see?’ ‘Nothing!’

Although widespread in non-Standard English varieties, negative concord is absent in Standard English. Thus, the co-occurrence of *no one* and *nothing* in a single clause results in two negations in interpretation, and (2a) and (2b) are therefore semantically, if not pragmatically, equivalent.

(2a) *No one said nothing.*
(2b) *Someone said something.*

In this respect, negation in Standard English behaves similarly to the negation operator familiar from formal logic. The same is clearly not true, however, in negative concord languages such as Maltese. In particular, the behavior of certain apparently negative items in these languages, such as *xejn* in (1), seems to vary according to whether they occur singly in a clause, or together. Items with this kind of variable behavior are often called “n-words”, after Laka (1990). A definition of “n-word”, adapted from Giannakidou (2006: 328), is given in (3).

(3) An expression α is an n-word if:
(a) α can be used in structures containing predicate negation or another α-expression yielding an interpretation of the clause as containing only one logical negation; and
(b) non-sentential/elliptical strings containing α and lacking a negator can be interpreted negatively.

Observe that while Maltese *xejn* obeys both clauses of (3), Standard English negative indefinites such as *no one* and *nothing* obey only the second, and are therefore not n-words, on this definition.

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1 Although the label itself suggests a theoretical intuition that the presence of both apparently negative elements is the result of some form of agreement, parallel to, e.g., case or number agreement, contemporary use of the term “negative concord” should not, in general, be taken to presuppose such an analysis.

2 Maltese data are either taken from Haspelmath & Caruana (1996) or are the result of personal observation, unless otherwise indicated.

It is the existence and behavior of n-words that constitutes the central difficulty in the analysis of the syntax and semantics of negative concord languages. N-words are hard to account for in many syntactic and semantic formalisms, primarily because these formalisms attempt to adhere strictly to the two principles outlined in (4) and (5).

(4) Principle of compositionality:
The meaning of a complex expression depends solely on its syntactic structure and the meanings of its constituent parts.

(5) Principle of full determinacy:
Each individual lexical item makes a single fixed set of syntactic and semantic contributions to the clause in which it appears.

Something like the principle of compositionality as articulated in (4) is widely recognized and cited. Although the principle runs into difficulties in the special case of idiomatic expressions whose meanings are not predictable from their structure and the meanings of their constituents (cf. the frequent label "non-compositional" for such expressions), most semanticists, including those working within the framework of Dynamic Syntax, agree that something like this principle is essential if we are to explain how interlocutors are able to comprehend entirely novel utterances.[3] The principle in (5), by contrast, is rarely articulated, but nevertheless widely taken for granted, except by those who specifically argue against it (e.g. Carston 2002).

Any framework which adheres strictly to both (4) and (5) is forced to give an account of n-words in which some element of their behavior is deceptive: either n-words are simply inherently negative, in which case their satisfaction of the second clause of (3) is unsurprising, but their satisfaction of the first clause is unexpected and requires further explanation; or they are inherently non-negative, in which case it is the second clause of (3) that needs to be explained. Several variations on both of these approaches have been proposed in the literature, but there are difficulties with each of them.

Starting with analyses that deny the negativity of n-words (e.g. Giannakidou 2000), these have the advantage that explaining the meaning of utterances like (1a) is straightforward: there is only a single negation in interpretation because there is only a single negative expression (the predicate negator *ma*) in the clause. But on this view the negative interpretation of (1b) is unexpected and has to be explained by positing a silent or ellipsed negator in this structure. In some frameworks, such as mainstream generative grammar, it is commonplace to posit elements of structure which have no phonological realization; but many other approaches to syntax would view the need to invoke a silent negator in non-sentential utterances like (1b) as a deficiency in a theory of n-words. Moreover, if we do concede the possibility of unpronounced negators in non-sentential

3 It is often assumed that linguists working in the framework of Construction Grammar necessarily reject the principle of compositionality. See Kay & Michaelis (2012) for arguments against this assumption.

utterances, we then need to explain why it is that uncontroversially non-negative NPIs (negative polarity items) such as English *anything* in (6) are not licensed (by a hypothetical silent negator) with a similar interpretation in a similar context.

(6) *What did you see? *Anything*.
Intended interpretation: 'Nothing'.

Turning to analyses of n-words which view them as simply inherently negative (e.g. Haegeman & Zanuttini 1991, De Swart & Sag 2002), these of course have the advantage that the negative interpretation of non-sentential utterances such as (1b) receives a natural explanation without any attendant expectation that examples like (6) should be grammatical. Where these approaches struggle is in explaining why there is only a single logical negation in the interpretation of examples like (1a), instead of the double logical negation that we would expect, given the presence of two items in the clause which are, by hypothesis, inherently negative. These approaches are therefore forced to posit some kind of negative absorption or factorization operation whenever negative expressions co-occur. But the extent to which one can posit such an operation and maintain strict adherence to the principle of compositionality is open to question.

There is also an approach to n-words which combines the two just described, by claiming that n-words are in fact, in each case, pairs of homophonous items, which are identical in all respects other than their negativity (e.g. Herburger 2001). This then allows a natural explanation for the behavior of n-words in both non-sentential utterances without a negator (e.g. *xejn* in (1b) is inherently negative) and in co-occurrence with other negative expressions (e.g. *xejn* in (1a) is a distinct lexical item which is inherently non-negative). The obvious disadvantage of such an approach is its contravention of Occam's Razor, which is so blatant that this must be seen as a last-resort solution.

Finally, mention should also be made of the influential approach of Zeijlstra (2004), which is essentially a version of the first approach described above. Zeijlstra suggests that n-words are not inherently negative, but that they bear an uninterpretable negative feature which requires valuation by some other item in the derivation with an interpretable negative feature, in order for that derivation to converge. This account suffers from the same problems as the first approach described above, in that the item which carries the interpretable negative feature is often necessarily a phonologically null negative operator. However, it carries with it an additional difficulty, in that it predicts, counterfactually as we will see in section 4.3, that n-words should not occur in clauses that lack any kind of negative interpretation (and therefore can have no item, whether pronounced or not, that bears an interpretable negative feature).

A characteristic shared by all of these approaches to n-words is their failure to capture the intuitive, pre-theoretical essence of n-words: namely that in some contexts n-words **make** a sentence negative, whereas in other contexts they merely **keep** a sentence negative. This quality of n-words is in fact inexpressible in any account which adheres to the principle of full determinacy given in (5), which all of the approaches outlined above tacitly do. In Dynamic Syntax, however, (5) is explicitly rejected, and the syntactic and semantic contributions of a lexical item to the clause in which it appears are always sensitive to context. Note, however, that rejection of (5) does not entail the rejection of the principle of compositionality in (4). In its rejection of (5), Dynamic Syntax is not qualitatively different to standard approaches to semantics which acknowledge that pronouns and other indexical expressions may have invariant lexical entries while their actual reference in a particular instance is determined by context. Dynamic Syntax simply claims that these kinds of lexical entries, which are unitary and invariant but whose contributions to interpretation may vary within certain well-defined parameters, are characteristic of much more of the lexicon than merely indexicals (see Lasersohn 2012 for discussion along similar lines).

In what follows we will see that this view of the lexicon enables us to neatly capture the properties of negation and indefinites in Maltese by formalizing two intuitions: (i) that negation is a property of sentences or propositions rather than of lexical items per se; and (ii) that an n-word's contribution to the negativity of a sentence is context-dependent.

3. Dynamic Syntax

Dynamic Syntax is a formal model of the incremental construction of semantic representations of content from strings of words uttered in context.[4] The only level of representation it uses to achieve this is predicate-argument structure, which is depicted using binary-branching tree diagrams. These therefore represent the interpretation of words in context, not the constituent structure of words in a string. An example of a "basic" (i.e. complete) tree is given in (7). By convention, the argument daughter of a given node is shown on the left and the functor daughter on the right.

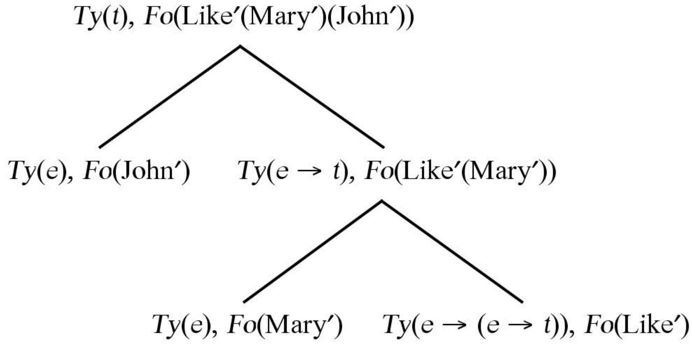
The tree in (7) represents a completed derivation. Each node on this tree carries two sorts of annotation (or "decoration"). The first is a semantic type specification with the label *Ty*. The basic types are *Ty*(*t*) for propositional (truth-evaluable) objects and *Ty*(*e*) for entities. Functor nodes have an input-output type specification: $Ty(e \rightarrow t)$, for example, is the type of a function that takes an object of *Ty*(*e*) as input and returns an object of *Ty*(*t*) as output, i.e. a one-place predicate.

The incremental parsing of an utterance is modeled as a progression through a series of partial trees to a final basic tree as in (7), which represents a complete proposition. This progression happens through a combination of two types of process: i) general transition rules, which can apply, subject to certain constraints, at any stage of a derivation, without the need for a specific trigger, and ii) "lexical actions", which are instructions that are part of the lexical entry of a word, and which cause nodes to be built

4 This is a highly abbreviated presentation of the framework. For a fuller introduction readers are directed to Cann et al. (2005).

and/or annotated with specific type and formula information as soon as the word in question is parsed.

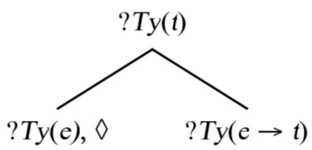
(7) ‘John likes Mary’.



A key feature of this incremental system is underspecification (of content, structure, structural relations), together with requirements for specification in context. Requirements are expressed as decorations on nodes, using the symbol ‘?’, prefixed to the required element, and typically pertain to the establishment of particular formula values or semantic types.

The initial state of a tree is thus approximately as in (8), with the root node decorated with a requirement to establish a propositional formula, and an argument daughter with a $?Ty(e)$ requirement (where the subject will be parsed) and a functor daughter with a $?Ty(e \rightarrow t)$ requirement (where the predicate will be parsed). The argument daughter of the root node is also decorated with the “pointer” ◊, which indicates the currently active node in the tree.

(8)



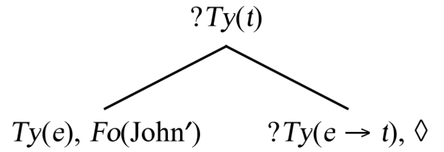
The tree is gradually decorated (and potentially grows new nodes) as words are parsed, their lexical entries are accessed, and the specified lexical actions are carried out. The lexical entry for the name *John* is given in (9).

(9) *John*

IF	$?Ty(e)$	Trigger
THEN	`put`($Ty(e)$, Fo(John′))	Annotation
ELSE	`Abort`	Failure

This is to be interpreted as follows: if the pointer is currently decorating a node with a requirement to establish something of *Ty*(*e*), then make a *Ty*(*e*) decoration and the formula decoration *Fo*(John′). Otherwise, abort the parse. Since in (8) the pointer is indeed at a node with a ?*Ty*(*e*) decoration, the actions associated with the lexical entry for *John* will be carried out if this word is parsed at this stage. The requirement to establish something of *Ty*(*e*) at this node will therefore have been fulfilled, and various general transition rules, the details of which are unimportant for present purposes, will result in the pointer then moving to the functor node, producing the tree in (10).

(10)

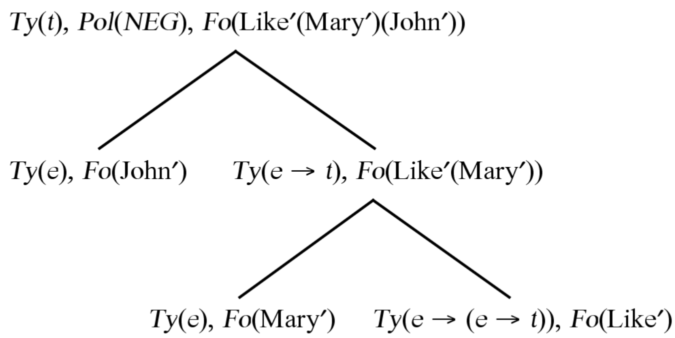


As each word in the string *John likes Mary* is parsed, the various tree nodes are built and/or annotated with type and formula information, until finally the ?*Ty*(*t*) requirement at the root node is satisfied and a propositional formula is established, as in (7). The notion of well-formedness or grammaticality that emerges from this model is that a given language string is well-formed if there is at least one possible combination of transition rules and lexical actions associated with the lexical entries of the words in the string that results in a tree with no outstanding requirements and no inconsistent sets of information holding at any particular node.

4. Negation in Dynamic Syntax

Recent developments in Dynamic Syntax make use of a more fine-grained structure than that presented in (7), in which the argument daughter of any *Ty*(*t*) node is an event term of type (e_{sit}) and its functor daughter is of type ($e_{sit} \rightarrow t$) (this being the mother of the predicate node, which is of type ($e \rightarrow (e_{sit} \rightarrow t)$)). This *Ty*($e_{sit}$) node is central to the formalization of tense, aspect, mood and so on. However, in simpler expositions of the framework (e.g. Cann et al. 2005) the structure is as in (7), and tense, for example, is represented as a quasi-syntactic feature which decorates the *Ty*(*t*) node (e.g. *Tns*(*PRES*)), acting as an abbreviation and promissory note for a full semantic account. There is as yet no definitive representation of negation in Dynamic Syntax, but ongoing work suggests that the *Ty*(e_{sit}) node will be central to the full account. For the purposes of this article, however, we will retain the simplified structure presented in (7) and, just as with tense, indicate the negative or affirmative polarity of a proposition with a feature *Pol*(*NEG*) or *Pol*(*AFF*) decorating the *Ty*(*t*) node, as in (11), which is otherwise identical to (7).

(11) ‘John doesn’t like Mary’.



We are now in a position to present the analysis of negation and indefinites in this system. The essence of this analysis is that straightforward negative expressions, such as Standard English *no one* and *nothing*, always automatically decorate the *Ty*(*t*) node with a *Pol*(*NEG*) feature whenever they are encountered in the course of a parse, whereas n-words, such as Maltese *xejn*, are sensitive to whether the *Ty*(*t*) node already has this decoration or not.

4.1. True negative expressions

True negative expressions satisfy the second clause of (3) – they are interpreted negatively on their own in nonsentential utterances – but not the first: when they combine with predicate negation or another true negative expression, as in (12), the result is more than one logical negation in interpretation.

(12) *John doesn’t like nothing*.

We can capture this behavior with the type of lexical entry in (13).[5]

(13) *nothing*

IF	?*Ty*(*e*)
THEN	`put`(*Ty*(*e*), *Fo*(ε, x, Thing′(x)));
	`gofirst`(?*Ty*(*t*));
	`put`(*Pol*(*NEG*))
ELSE	`Abort`

5 Quantification in Dynamic Syntax, which we do not present in detail here, is expressed in terms of Hilbert & Bernay’s (1939) epsilon calculus, where quantified expressions are treated as naming an arbitrary witness of the set denoted by the restrictor. See Kempson et al. (2001: ch.7) for details.

This lexical entry stipulates that, if the pointer is at a node with a ?*Ty*(*e*) requirement at the moment the entry is accessed, then first that node will be annotated with *Ty*(*e*) and the existential formula appropriate for this kind of indefinite pronoun; then the pointer will be moved to the first dominating node that has an outstanding ?*Ty*(*t*) requirement,[6] where it will make a *Pol*(*NEG*) annotation; otherwise the parse will abort. This guarantees that if the word *nothing* is successfully parsed, the result will always automatically be a *Pol*(*NEG*) decoration on the root node.

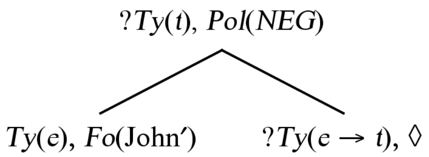
Predicate negators, such as English *not* in (14), will have a very similar lexical entry in languages that lack n-words, again always automatically annotating the root node with *Pol*(*NEG*), whether or not some other element has already done so.

(14) *not*

IF	?*Ty*($e \rightarrow t$)
THEN	`gofirst`(?*Ty*(*t*));
	`put`(*Pol*(*NEG*))
ELSE	`Abort`

Parsing *John doesn't* using the lexical entries in (9) and (14) (and ignoring issues of tense and aspect) results in the partial tree in (15), with a *Pol*(*NEG*) decoration at the root node.

(15) 'John doesn't…'



Parsing the whole of *John doesn't like nothing*, using the lexical entry in (13), generates the completed tree in (16), in which the lexical entry for *nothing* has caused the root node to be decorated with a second *Pol*(*NEG*) feature, resulting in the required double negation interpretation.[7]

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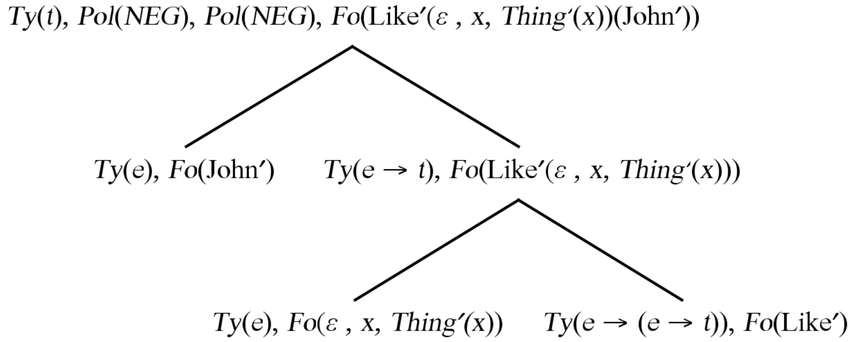
[6] In structures with embedded clauses there will be more than one *Ty*(*t*) node and only one of these will be the root node (the others will be argument daughters of functor nodes).

[7] Technically, separate identical annotations at the same node should collapse into one in Dynamic Syntax. This could perhaps be avoided here by using the action freshput rather than put, resulting in each *Pol*(*NEG*) decoration having a distinct uniquely identifying index. I omit this detail, however, since the use of such quasi-syntactic features is in any case an abbreviation for a full semantic account, as explained at the beginning of section 4.

(16) 'John doesn't like nothing'.



This completes the discussion of true negative expressions. We now turn to discuss negation and n-words in Maltese.

4.2. Negative concord in Maltese

Maltese, like the Slavic languages, Romanian and various other languages, is a so-called "strict" negative concord language. This means that it has the following three characteristics: i) when n-words co-occur with each other and/or with predicate negation, there is only one logical negation in interpretation; ii) every (non-elliptical) negative sentence must have negation marked on the predicate, regardless of the presence and position of n-words; iii) all indefinite pronouns in the scope of negation must be n-words. Thus in (17) there is just one logical negation in interpretation, despite the presence of two n-words (*ħadd* and *xejn*) and one marker of predicate negation (*ma*); *ma* is obligatorily present – omitting it from this sentence results in ungrammaticality; and replacing these two n-word indefinites with their non-n-word equivalents, *xi ħadd* and *xi ħaġa*, also results in ungrammaticality.[8]

(17) *Ħadd ma qal-li xejn.*
n.body NEG say.PRF.3MSG-to.me n.thing
'Nobody told me anything.'

[8] This is a simplification of the true picture, ignoring issues of relative scope, which cannot be addressed within the confines of this article. In fact, non-n-word indefinites of the *xi*-series are only ungrammatical with clausemate negation on an interpretation in which negation takes wide scope. If an indefinite of the *xi*-series follows negation then it may be grammatical if it takes scope above negation, e.g.:

i) *Jekk ma fhimt-x xi ħaġa…*
if NEG understand.PRF.2SG-NEG something
'If there is something [specific] you haven't understood…'
[Not possible: 'If you haven't understood anything…']

These observations are true of all n-word and non-negative members of the Maltese indefinite paradigm, respectively. The full paradigm is given in Table 1.

	n-words	non-negative
Determiner	*ebda*	*xi*
Thing	*xejn*	*xi ħaġa*
Person	*ħadd*	*xi ħadd*
Time	*qatt*	*xi darba*
Place	*imkien*	*xi mkien*

Table 1: Maltese indefinites

In addition to the features of Maltese negative sentences that are characteristic of strict negative concord languages generally, there are three further features that need to be considered which are more specific to the syntax of Maltese negation: i) negative sentences without indefinite pronouns must, in general, have the bipartite construction *ma* ...*-x* (just one of the two elements is insufficient); ii) however, prohibitives (negative imperatives) generally lack a preverbal negator;[9] iii) n-words and *-x* do not co-occur in a clause. Thus in (18) neither *ma* nor *-x* may be omitted, whereas the prohibitive in (19) is perfectly grammatical with *-x* alone, and in (17) *-x* must be absent in order to preserve grammaticality.

(18) *It-tifla* *ma* *rat-x* *lit-tifel.*
the-girl NEG see.PRF.3FSG-NEG to-the-boy
'The girl didn't see the boy.'

(19) *Tarmi-x* *żibel* *hawn.*
throw.PROH.2SG-NEG rubbish here
'Do not throw rubbish here.'

Three further generalizations hold concerning the negative elements in (17)–(19): i) *-x* is always associated with a negative interpretation,[10] and at least some sentences with *-x* alone are well-formed; ii) *ma* is also always associated with a negative interpretation but a sentence with (negative) *ma* alone is never well-formed;[11] iii) n-words such as *xejn* 'n.thing' and *ħadd* 'n.body' are always associated with a negative interpretation, but when they co-occur there is only a single logical negation in interpretation.[12]

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[9] *Ma* is never possible with prohibitives but an archaic preverbal negator *la* occasionally occurs with prohibitives in literary Maltese.

[10] I assume that the particle *-x* which appears without *ma* in affirmative interrogative and conditional clauses is (synchronically) a separate lexical item to the negator *-x*.

[11] Note that, while this generalization is valid for any novel utterance, certain formulaic utterances such as proverbs preserve an archaic, non-productive use of negative *ma* in the absence of other negative elements. See Bergman (1996) for a similar phenomenon in Egyptian and Moroccan Arabic.

[12] I treat *xi ħadd* as a single lexical item, not as a phrase containing the n-word *ħadd*. Compare *qabelxejn* 'first of all', which is clearly not to be analysed as a phrase consisting of *qabel* 'before' plus *xejn* 'n.thing'. These are fossilized expressions, preserving the original (but now obsolete) non-n-word semantics of *ħadd* and *xejn*.

In Dynamic Syntax terms, these three generalizations may be re-expressed as follows: i) *-x* always automatically decorates the ?*Ty*(*t*) node with *Pol*(*NEG*); ii) *ma* decorates the ?*Ty*(*t*) node with ?*Pol*(*NEG*), that is, a requirement for *Pol*(*NEG*), not the feature itself; iii) n-words such as *xejn* and *ħadd* decorate the ?*Ty*(*t*) node with *Pol*(*NEG*) if and only if it does not already carry this decoration.

The lexical entries which underlie these generalizations are as follows.

(20) *-x*

IF	?*Ty*($e \rightarrow t$)		
THEN	`gofirst`(?*Ty*(*t*))		
		IF	∃**x**.*Pol*(*NEG*)(**x**)
		THEN	`Abort`
		ELSE	`put`(*Pol*(*NEG*))
ELSE	`Abort`		

Note that the lexical entry for *-x* in (20) is similar to the one for English *not* given in (14), except that (20) instructs the parser to inspect the immediately dominating ?*Ty*(*t*) node and ascertain whether it already carries a *Pol*(*NEG*) annotation. The parse then only makes a *Pol*(*NEG*) annotation at that node if there is not already one present. If some other element has already made a *Pol*(*NEG*) decoration, then the parse will abort. This captures the fact that *-x* cannot appear in (17).

The lexical entry for *ma* is given in (21).

(21) *ma*

IF	?*Ty*($e \rightarrow t$)
THEN	`gofirst`(?*Ty*(*t*)); `put`(?*Pol*(*NEG*))
ELSE	`Abort`

The central feature of this lexical entry is that it annotates the ?*Ty*(*t*) node with a requirement for *Pol*(*NEG*) rather than the feature itself, and it does this regardless of any other annotations that might already have taken place. The key consequence of this is that the presence of *ma* before *-x* in a string will not cause the parse to abort, since the root node being decorated with ?*Pol*(*NEG*) is not equivalent to its being decorated with *Pol*(*NEG*). On the other hand, if *ma* makes its ?*Pol*(*NEG*) decoration and there is no other lexical item in the string to make an actual *Pol*(*NEG*) decoration, then the tree associated with that string will contain an outstanding requirement once all the words have been parsed and will therefore be ill-formed. This guarantees that *ma* cannot be the only negative element in a sentence. Note that (21) also allows for an n-word preceding *ma* to be the only other negative element in a string, as in (22), since adding a requirement for a particular annotation to a node which already has that annotation simply results in the instant satisfaction of that requirement.

(22) *Ħadd ma ġie.*
n.body NEG come.PRF.3MSG
'No one came.'

An example of the lexical entry for an n-word is given for *xejn* in (23). *Mutatis mutandis*, the entries for other n-words will be the same (but see section 4.3 for the problem of *qatt* '(n)ever').

(23) *xejn*

IF	?*Ty*(*e*)	
THEN	`put`(*Ty*(*e*), *Fo*(ε, x, Thing′(x)));	
	`gofirst`(?*Ty*(*t*))	
	IF	∃**x**.*Pol*(*NEG*)(**x**)
	THEN	`stayput`
	ELSE	`put`(*Pol*(*NEG*))
ELSE	`Abort`	

Compare the lexical entry for *xejn* with that of English *nothing* in (13). The first three lines are identical. Once the pointer has been moved to the first dominating node with a ?*Ty*(*t*) requirement, however, the two entries diverge: *nothing* always automatically makes a *Pol*(*NEG*) decoration at that node; *xejn*, on the other hand, only makes this decoration if some other item has not already done so. If some other item has already made a *Pol*(*NEG*) decoration, then the `stayput` instruction tells the parser that this lexical entry has no more work to do – in particular, it will not make a second *Pol*(*NEG*) decoration. This is the formalization of the intuition referred to in section 2: that in some contexts n-words make a sentence negative, whereas in other contexts they merely keep a sentence negative. We now see that an n-word only makes a clause negative (by causing the ?*Ty*(*t*) to be annotated with *Pol*(*NEG*)) when it is the first element capable of making a *Pol*(*NEG*) decoration to be parsed in a given string. This captures the fact that sentences such as (17), which contain multiple n-words (and *ma*) will be interpreted as containing just one logical negation, unlike sentences like (12) in non-negative concord languages such as Standard English, in which there is one logical negation in interpretation for every true negative expression in the sentence. Note that this analysis of n-words also covers the case of non-sentential utterances in which an n-word is the first (and only) negative element, as in (1b). The lexical entry in (23) ensures that these utterances will always be interpreted as negative, which is the correct result.

The lexical entries for non-n-word indefinites of the *xi*-series, such as that of *xi ħaġa* 'something/anything' given in (24), are very similar to their n-word counterparts, except that, rather than doing nothing if some other element has already made a *Pol*(*NEG*) decoration, these elements will in fact cause the parse to abort, ensuring that a non-n-word indefinite in the scope of negation is ungrammatical (cf. fn. 8).

(24) *xi ħaġa*

IF	?$Ty(e)$		
THEN	`put`($Ty(e)$, $Fo(\varepsilon$, x, Thing′(x)));		
	`gofirst`(?$Ty(t)$)		
	IF	∃**x**.$Pol(NEG)$(**x**)	
	THEN	`Abort`	
	ELSE	`stayput`	
ELSE	`Abort`		

This completes the analysis of indefinites in the scope of negation in Maltese (but see sections 4.3 and 4.4). However, we have not yet accounted for the fact that in Maltese, as in other strict negative concord languages, any sentence which is interpreted as negative and which contains an indicative verb must have negation marked on that verb. In Maltese an indicative verb in a negative sentence must be marked with *ma*. (25)–(26) are therefore ungrammatical.

(25) **It-tifla* *rat-x* *lil-tifel.*
the-girl see.PRF.3FSG-NEG to-the-boy
Intended: 'The girl didn't see the boy.'

(26) **It-tifla* *rat* *xejn.*
the-girl see.PRF.3FSG n.thing
Intended: 'The girl didn't see anything.'

As we have seen, a non-sentential utterance lacking a verb but containing an n-word is interpreted as negative, despite the absence of any marker of negation other than the n-word. In fact, negative *ma* cannot occur except in the presence of an indicative verb, or verb-like element such as a copula. This, when considered alongside the fact that a negative sentence also cannot be grammatical if the only negative element it contains is *ma*, suggests that *ma* should not be considered an independent lexical item, but rather a form of (prefixing) negative inflection on indicative verbs. That is, all indicative verbs in Maltese have to appear in a special negative form (i.e. with prefixed *ma-*) if they contribute to a proposition which is interpreted as negative. The lexical entry for *ma* in (21) therefore becomes the entry for negative indicative morphology specifically.[13] The lexical entry for affirmative indicative morphology (i.e. indicative verbs lacking the *ma*-prefix) is then as in (27), where $Pol(AFF)$ is a feature specifying an affirmative value for the polarity of the proposition.

[13] This has the added advantage of (correctly) ruling out the possibility of preverbal *ma* with prohibitives.

(27) *AFFIRMATIVE INDICATIVE MORPHOLOGY*

IF	$?Ty(e \rightarrow t)$
THEN	`gofirst`($?Ty(t)$);
	`put`($Pol(AFF)$)
ELSE	`Abort`

The consequence of (27) is that any sentence that contains both a verb with affirmative indicative morphology (i.e. lacking the *ma-* prefix) and some element that triggers a *Pol*(*NEG*) decoration on the root node will be ill-formed, since having a *Pol*(*NEG*) and a *Pol*(*AFF*) decoration on the same node is incoherent. Ungrammatical sentences such as (25)–(26) are thus ruled out. At the same time, prohibitive sentences without preverbal negation, such as (19) and (28), will not be ruled out, since, unlike with affirmative indicative morphology, prohibitive morphology will not involve a *Pol*(*AFF*) decoration at the root node.[14]

(28) *Tarmi* *xejn* *hawn.*
throw.PROH.2SG n.thing here
'Do not throw anything here.'

In fact, since prohibitives are necessarily always associated with a negative interpretation and will always occur together with either *-x* (as in (19)) or an n-word (as in (28)), the lexical entry for prohibitive morphology will be similar to that of *ma*, in that it will include an instruction to annotate the root node with ?*Pol*(*NEG*) requirement, which will then need to be satisfied later in the parse by some element that will make a *Pol*(*NEG*) decoration (i.e. *-x* or an n-word).

4.3. The problem of *qatt*

In some strict negative concord languages (such as Catalan, which is "optionally strict"; Vallduví 1994, Espinal 2000) n-words may appear in nonveridical contexts other than negation (such as interrogative or conditional clauses) without any associated negative interpretation. Maltese appears to have just one such n-word: *qatt* '(n)ever', as illustrated in (29)–(33).

(29) *Ma* *niċħd-ek* *qatt*
NEG deny.IMPF.1SG-you (n)ever
'I will never deny you.'

[14] Prohibitive verbal morphology is homophonous with second person affirmative indicative morphology. It would be possible to construct a single lexical entry that allows for either interpretation depending on the context, but for simplicity I will assume here that the two types of morphology, though homophonous, have distinct lexical entries.

(30) *Qatt ma kont daqshekk ferħan*
(n)ever NEG be.PRF.1SG so happy
'I have never been so happy.'

(31) *Meta se titilqu? Qatt!*
when FUT leave.IMPF.2PL (n)ever
'When will you leave?' 'Never!'

(32) *Qatt mort Londra?*
(n)ever go.PRF.2SG London
'Have you ever been to London?'

(33) *Jekk qatt tiġi Londra, ejja ara-ni.*
if (n)ever come.IMPF.2SG London come.IMP.SG see.IMP.SG-me
'If you ever come to London, come and see me.'

Similarly to NPIs, such as English *ever*, *qatt* is only grammatical in nonveridical contexts. It cannot appear in an affirmative declarative sentence such as (34), for example.

(34) **Qatt mort Londra.*
(n)ever go.PRF.1SG London
Intended: '*I have ever been to London (i.e. on at least one occasion).'

Clearly then, the lexical entry for *qatt* needs to be sensitive to the force of the clause in which it appears (specifically whether the clause is veridical or nonveridical). To formalize this we will make use of another quasi-syntactic feature, parallel to *Pol*(*NEG*), namely *Force*(*NV*). Note that the presence of a *Force*(*NV*) annotation at a given ?*Ty*(*t*) node will be entailed by various more specific annotations at that node, such as *Pol*(*NEG*), *Force*(*COND*) (for conditional clauses) or *Force*(*INT*) (for interrogative clauses), but crucially not by mere requirements for such annotations, such as the ?*Pol*(*NEG*) decoration made by *ma*.

Recall that the n-words other than *qatt* only make a *Pol*(*NEG*) annotation at the ?*Ty*(*t*) node if some other item has not already done so, and that sentences such as (26), in which an n-word appears in the absence of preverbal *ma*, are ruled out by the incompatibility of the *Pol*(*NEG*) annotation made by the n-word and the *Pol*(*AFF*) annotation made by the affirmative indicative morphology of the verb, as set out in (27). Although *qatt*, like the other n-words, cannot appear in affirmative declarative sentences, we cannot rely on a straightforward incompatibility with affirmative indicative verbal morphology to achieve this, since *qatt* can appear in affirmative clauses, as long as they are nonveridical, as illustrated in (32)–(33). However, there is a significant asymmetry in the word order possibilities of *qatt* in negative versus other nonveridical contexts, which suggests that some sort of incompatibility with a *Pol*(*AFF*) decoration at the ?*Ty*(*t*) node also obtains here.

As is clear from (29)–(30), the positioning of *qatt* in negative sentences is relatively free: it may appear either before or after the predicate.[15] By contrast, it appears that *qatt* only ever appears before the predicate when it occurs in other nonveridical contexts, such as interrogatives (32) and conditionals (33) (Michael Spagnol, p.c.). Data from the MLRS Corpus of contemporary Maltese give initial support to this impression.[16] A search of *jekk* 'if' followed by *qatt* with between 1 and 6 other words intervening returns 689 matches in 606 different texts. Of these 689 matches, there is just a single clear example of *qatt* following the predicate in an affirmative clause:

(35)	*Jekk*	*dak*	*il-prodott*	*iwassal*	*allaħares*	*qatt*	*għall-mewt...*
	if	that	the-product	lead.IMPF.3MSG	God.forbid	(n)ever	to.the-death

'If, God forbid, that product ever leads to death...'

This exception is perhaps best explained by the presence of *allaħares* 'God forbid' immediately before *qatt*: *allaħares qatt* is an extremely frequent collocation, to the extent that it could be considered a single lexical item with different properties to those of *qatt* alone. In any case, it seems justified for present purposes to operate on the assumption that *qatt* can in general only follow the predicate in negative clauses – otherwise it must always precede the predicate.

This is significant because we can straightforwardly capture both these word-order facts and the fact that the predicate in a negative clause containing *qatt* cannot exhibit affirmative indicative morphology (i.e. preverbal *ma* is obligatory) simply by saying that the lexical entry for *qatt* will instruct the parser to abort if the ?*Ty*(*t*) node is already annotated with *Pol*(*AFF*). This will ensure that any affirmative sentence in which *qatt* follows the verb will be ill-formed, as will any negative sentence which contains postverbal *qatt* but not *ma*.

A further difficulty with *qatt* is that, although it must be responsible for the negative interpretation of nonsentential utterances as in (31), its lexical entry cannot, like those of the other n-words, simply make a *Pol*(*NEG*) annotation at the root node as long as no other item has already done the same. This is clear from the fact that, unlike the other n-words, *qatt* is not always associated with a negative interpretation when it appears in nonveridical contexts. It must therefore be sensitive not only to whether or not the ?*Ty*(*t*) node already has a *Pol* (*NEG*) annotation, but also to whether it has a more general *Force*(*NV*) annotation. I assume that such an annotation will be provided by the lexical entries for nonveridical operators such as *jekk* 'if' (note that *qatt* never precedes *jekk* in the protasis of a conditional sentence) and interrogative intonation. The lexical entry for the negative content of *qatt* is given in (36).

[15] The latter possibility seems to be much more characteristic of literary than of colloquial Maltese (cf. Caubet 1996: 92).

[16] An exhaustive study of this issue is beyond the scope of the present article. The MLRS Corpus is accessible at http://mlrs.research.um.edu.mt/index.php.

(36) *qatt*$_{NEG\_CONTENT}$

IF	?*Ty*(*e*)				
THEN	`gofirst`(?*Ty*(*t*))				
	IF	∃**x**.*Pol*(*AFF*)(**x**)			
	THEN	`Abort`			
	ELSE	IF	∃**x**.*Pol*(*NEG*)(**x**)		
		THEN	`stayput`		
		ELSE	IF	∃**x**.*Force*(*NV*)(**x**)	
			THEN	EITHER	`stayput`
				OR	`put`(*Pol*(*NEG*))
			ELSE	`put`(*Pol*(*NEG*))	
ELSE	`Abort`				

This entry first instructs the parser to move the pointer to the immediately dominating ?*Ty*(*t*) node and to check whether it is annotated with *Pol*(*AFF*). If this is the case then the parse is aborted. This ensures that no string will be well-formed if it contains *qatt* following an indicative verb without *ma*. If there is no *Pol*(*AFF*) annotation at the ?*Ty*(*t*) node, it is then inspected for a *Pol*(*NEG*) annotation. If a *Pol*(*NEG*) annotation is present the pointer is instructed to `stayput` and the lexical entry has no more work to do. This ensures that when *qatt* occurs in a string with one or more preceding n-words there will only be one negation in interpretation.

Turning to the final part of the lexical entry, if there is no *Pol*(*NEG*) annotation present at the ?*Ty*(*t*) node, then *qatt* cannot simply make an automatic *Pol*(*NEG*) annotation at this stage as do the other n-words, as in (23). Sentences containing *qatt* plus some non-negative nonveridical operator and no other n-words are interpreted as affirmative, as illustrated in (32)–(33). This is why the `stayput` instruction in the first disjunct of the final part of (36) is required. This instruction allows *qatt* to neither make a *Pol*(*NEG*) annotation nor to abort the parse, if the appropriate conditions hold. The (exclusive) disjunction is necessary, however, because *qatt* may also appear in indicative clauses which **are** interpreted as negative despite also containing some non-negative nonveridical operator such as *jekk* 'if', though in this case the verb must of course be marked with *ma*, as in (37).

(37)

Jekk	*qatt*	*ma*	*doqt*	*il-benna*	*taż-żebbuġa...*
if	(n)ever	NEG	taste.PRF.2SG	the-flavor	of.the-olive

'If you've never tasted olives...'

Recall that the grammaticality of a string in Dynamic Syntax depends on there being **at least one** set of actions prompted by that string that results in a basic tree with no outstanding requirements and no inconsistent sets of information holding at any particular node. In parsing any given string there will always be a great many possible sets of actions that could be applied to that string which do not give rise to a coherent basic tree. As a grammar formalism rather than a model of the entire process of utterance interpretation, Dynamic Syntax is not, in itself, concerned with the mechanisms by which speaker-hearers sift through all the logically possible sets of actions to exclude those which will result in failed parses in a particular instance (but see Sato 2011 for work on this issue). What is crucial for our purposes is that all sets of actions that would allow for inappropriate interpretations or word orders must be ruled out in one way or another.

Despite the optionality inherent in the disjunction in (36), inappropriate parses making use of (36) will indeed be ruled out. In particular, (36) will not allow for optionality in the interpretation of individual clauses containing *qatt* as negative or affirmative. This is consistent with the facts: any clause containing *qatt* is unambiguously either negative or affirmative.

To see that (36) does not allow for this kind of optionality, consider first a string such as (37). This can only receive a negative interpretation. But since *qatt* follows *jekk* 'if', which will have made a *Force*(*NV*) annotation at the root node, (36) allows a parse in which *qatt* makes no *Pol*(*NEG*) annotation – clearly the wrong result. However, a parse of (37) in which *qatt* makes no *Pol*(*NEG*) annotation cannot result in a well-formed basic tree. This is because (37) contains *ma*, which will decorate the root node with a ?*Pol*(*NEG*) requirement, as set out in (21). Since there are no words in (37) that are capable of making a corresponding *Pol*(*NEG*) annotation other than *qatt*, if *qatt* fails to do so, then the ?*Pol*(*NEG*) annotation made by *ma* will remain unsatisfied at the end of the parse. (37) will thus always receive the correct (negative) interpretation. The parse in which the second, appropriate disjunct of (36) is chosen is the only one which will result in a well-formed basic tree.

Conversely, if we consider a non-negative nonveridical sentence such as (33), here the second disjunct of the final part of (36) allows a parse in which the root node does receive a *Pol*(*NEG*) decoration, which is, again, the wrong result. In this case too, however, the inappropriate parse will not lead to a well-formed tree, since the verb following *qatt* in (33) carries affirmative indicative morphology (i.e. lacks a preceding *ma*), and will therefore annotate the root node with *Pol*(*AFF*), as set out in (27). But this will result in the root node being annotated with both *Pol*(*NEG*) and *Pol*(*AFF*), which is incoherent, and so this parse will fail. Sentences such as (33) will thus also always receive the correct (affirmative) interpretation, since this time a parse of (33) in which the *first* disjunct of (36) is chosen is the only one which will result in a well-formed basic tree.

Finally, (36) ensures that *qatt* will make a *Pol*(*NEG*) annotation at the ?*Ty*(*t*) node in strings where no nonveridical operator has already made either a *Force*(*NV*) or *Pol*(*NEG*) annotation at that same node. This captures the fact that (30) is interpreted as negative despite the fact that it contains no other element capable of making a *Pol*(*NEG*) decoration (recall that *ma* only decorates the ?*Ty*(*t*) node with a ?*Pol*(*NEG*) requirement), and it ensures that nonsentential utterances containing only *qatt*, as in (31), will always be interpreted as negative. Affirmative declarative sentences containing *qatt*, as in (34), will also be ruled out, since *qatt* in the absence of any nonveridical operator will necessarily make a *Pol*(*NEG*) annotation at the ?*Ty*(*t*) node, while the affirmative indicative morphology of the verb will make a *Pol*(*AFF*) decoration. The incoherence of these two contradictory annotations at the same node ensures that sentences such as (34) are ungrammatical.

The lexical entry for *qatt* in (36) is clearly rather complex, to the extent that there might justifiably be doubts raised as to whether it is really acquirable. I would suggest that it is acquirable in principle, and that no simpler entry which captures the data is likely to be found, but that the complexity is indeed such that acquirers are liable to simplify it over time. The most obvious simplification would be to eliminate (i.e. fail to acquire) the option of `stayput` in cases where some preceding item has made a *Force*(*NV*) annotation at the root node. This would render *qatt* no longer sensitive to nonveridicality in general, and would mean that it was always associated with a negative interpretation, thus bringing it into line with the other n-words, such as *xejn* 'n.thing' and *ħadd* 'n.body'. Crosslinguistically it is rather common for items which are historically non-negative but restricted to nonveridical contexts (i.e. NPIs) to narrow their distribution such that they are always associated with a negative interpretation (Ladusaw 1993 refers to this as the "argument cycle", see also Breitbarth et al. 2013), meaning it would not be surprising if the same fate befell *qatt*. Indeed, comparison with Arabic dialects shows very clearly that *ħadd* 'n.body', for example, has already undergone this development, being derived from the non-negative NPI *aḥad* 'anyone'.

4.4. An unresolved issue

The lexical entries for the predicate negator *-x* and the n-words *xejn* and *qatt*, given in (20), (23) and (36) respectively, correctly rule out structures like the one in (38), in which *-x* co-occurs with a preverbal n-word. But nothing in these lexical entries rules out structures like the one in (39), in which *-x* co-occurs with a postverbal n-word and which is just as ill-formed as (38): *-x* can never co-occur with n-words in any position.

(38) **Xejn ma waqa-x.*
n.thing NEG fall.PRF.3MSG-NEG
Intended: 'Nothing fell.'

(39) **It-tifla ma rat-x xejn*
the-girl NEG see.PRF.3FSG-NEG n.thing
Intended: 'The girl didn't see anything.'

Recall that the formula decorations on Dynamic Syntax trees represent concepts, not words. Words themselves do not feature in any form on these trees, which are simply representations of semantic content. This means that there is no way of writing into the lexical entries of n-words that the parse should be aborted if the negator *-x* – a specific lexical item – has appeared earlier in the string being parsed. As such, there is no simple way of ruling out ill-formed sentences like the one in (39) within the simplified system presented here, since writing into the lexical entries of n-words that the parse should be aborted if any other element has already made a *Pol*(*NEG*) annotation at the ?*Ty*(*t*) node would wrongly rule out well-formed sentences in which n-words co-occur, as in (17).

As noted at the beginning of section 4, however, the full semantic account of negation in Dynamic Syntax will most likely involve tree representations in which the argument daughter of any ?*Ty*(*t*) node is an event term of type e_{sit}. This node would then be one site at which negation could be expressed, while further structure above the root node representing the illocutionary force of an utterance (denial in the case of negation) could represent another. If we allow the possibility that negation may be expressed at more than one location in the tree, then it becomes possible to distinguish lexical items in terms of where they make their contribution to the negativity of the sentence. The general form of the account of why sentences like (39) are unacceptable would thus be that the negator *-x* makes its negative contribution at a different (lower) node than do n-words.

N-words would then involve three different possible sets of actions: a) annotate the higher node with negation if it does not already carry this annotation (i.e. if there has not already been an n-word earlier in the string); b) do not annotate the higher node with negation if it does already carry this annotation (i.e. if there has already been an n-word earlier in the string); or c) abort the parse if the lower node has already been annotated with negation (i.e. because *-x* has already occurred earlier in the string).

Independent evidence that *-x* should be analyzed as making its negative contribution at a lower node (specifically one within the immediate propositional domain of the predicate) than do n-words comes from biclausal structures. Here we find that the negation associated with *-x* is apparently never interpretable in a higher clause than the one in which it appears, illustrated in (40), whereas the negation associated with n-words routinely is, as in (41).

(40) *Ordna-lu* *ma* *jiċċaqlaq-x.*
order.PRF.3MSG-to.him NEG move.IMPF.3MSG-NEG
'He ordered him not to move.'
[Not possible: 'He didn't order him to move.']
[Borg & Azzopardi-Alexander 1996: 93]

(41) *M'għandi* *aptit* *nagħmel* *xejn.*
NEG-have-1SG appetite do.IMPF.1SG n.thing
'I don't feel like doing anything.'

Although the precise details remain to be worked out, this seems to be a promising and empirically justified way of accounting for the ungrammaticality of sentences such as (39).

5. Conclusion

The basic claim of this article is that Dynamic Syntax offers a way of accounting for the phenomenon of negative concord that is simple and accords with pretheoretical intuitions, while also adhering to the principle of compositionality set out in (4). This is made possible by the fact that Dynamic Syntax, unlike many other syntactic and semantic formalisms, explicitly rejects the principle of full determinacy set out in (5). Because Dynamic Syntax makes the intuitively obvious assumption that human beings construct interpretations of utterances on an incremental, left-to-right basis, it is committed to the idea that underspecification and subsequent update lie at the heart of knowledge and use of language. Thus, far from assuming that every lexical item makes a single fixed set of syntactic and semantic contributions to the clause in which it appears, Dynamic Syntax views lexical entries as inherently context-sensitive, their contribution to an ongoing parse being totally dependent on the state of the parse at the moment an entry is accessed. As such, the variable behavior of n-words in a language like Maltese is naturally accommodated by the basic architecture of the framework, eliminating the need to posit invisible elements, large-scale homophony, or arguably non-compositional absorption mechanisms.

Abbreviations

F	feminine	NEG	negation
FUT	future	PL	plural
IMP	imperative	PRF	perfect
IMPF	imperfect	PROH	prohibitive
M	masculine	SG	singular

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