

Cardinals, Agreement, and Plurality in Lebanese Arabic¹

In this paper, based on a novel observation concerning semantic effects with numerals larger than ‘ten’ in Lebanese Arabic (LA), I argue that (i) the availability of a collective reading on verbs in LA comes from the internal semantic composition of the DP, and (ii) the presence of a cardinal in a DP does not necessarily signal the existence of a semantic plurality.

The Facts: Nouns in LA are marked for number; adjectives and verbs following them agree (1).

1. a. Plural: l-wleed l-šaaTr-iin/*š-šaaTer fall-u/*fall; b. Singular: l-walad š-šaaTer/*-iin fall/*-u
 the-kid-PL the-smart-PL/*-ø left-PL/*-ø; the-kid-ø the-smart-ø/*-PL left-ø/*-PL
 c. Quantified: ktiir/tlat wleed/*walad šaaTr-iin/*šaaTer fall-u/*fall
 many/three kid-PL/*kid-ø smart-PL/*smart-ø left-PL/*left

Interestingly, DPs involving cardinals larger than ‘ten’ present an exception to the generalization in (1). In these cases, nouns are never plural-marked, and verbs and adjectives are optionally plural-marked (2).

2. Cardinals over ‘ten’: tleetiin walad/*wleed mnazzam/mnazzam-iin fall/fall-u
 thirty child-ø/*child-PL organized-ø/organized-PL left-ø/left-PL

Notably, the presence vs. absence of plural marking on both verbs and adjectives is reflected semantically. *Verbs:* When the verb is plural-marked, both a collective and a distributive reading are available (3).

When the verb is not plural-marked (henceforce ‘unmarked’), the collective reading is unavailable (4).

3. tleetiin walad akal-u gateau keemel 4. tleetiin walad akal gateau keemel
 thirty child-ø ate-PL cake whole thirty child-ø ate-ø cake whole
 i. 30 boys each ate a whole cake [distr.] i. 30 boys each ate a whole cake [distr.]
 ii. 30 boys jointly ate a whole cake [coll.] ii. *30 boys jointly ate a whole cake [*coll.]

Moreover, if the verb is inherently collective, only plural-marked verbs are licit, see (5) vs. (6).

5. ‘ešriin sabi lta’-u 6. *‘ešriin sabi lta’a
 twenty boy-ø met-PL ‘twenty boys met’ *twenty boy-ømet-ø ‘twenty boys met’

Adjectives: The optional plural agreement on adjectives signals an even stronger distinction: Unmarked adjectives must modify predicates of atomic individuals, and plural-marked ones must modify predicates of pluralities. Specifically, sentence (7a), with an unmarked adjective, is true if at least 50 individuals who arrived are engineers and each is an organized person, regardless of whether they are in any way organized as a group. Conversely, (7b), where the adjective is plural-marked, is true if at least 50 individuals who are engineers and are somehow organized as a group (e.g. in a union, or positioned in an organized way next to each other), arrived, regardless of whether they are individually organized people.

7. a. 50 mhandes mnazzam wessl-u b. 50 mhandes mnazzam-iin wessl-u
 50 engineer-ø organized-ø arrived-PL 50 engineer-ø organized-PL arrived-PL
 50 (individually) organized engineers arrived an organized 50 engineers arrived

Also, adjectives that inherently modify only singularities (e.g. ‘short’) must be unmarked (8a), and those that modify only pluralities (e.g. ‘aligned’) must be plural-marked (8b).

8. a. 40 telmiiz ‘aSiir/*’Saar weSSel b. 40 telmiiz maSfouf-iin/*maSfouf DeHk-u
 40 student-ø short-ø/*short-PL arrived-ø 40 student-ø aligned-PL/*aligned laughed-PL
 ‘forty short students arrived’ ‘forty students aligned in a row laughed’

Puzzle: As the absence of collective readings in (4) and (6) shows, contrary to expectation, the cardinal+noun complex can, but need not result in a plurality. I take this to mean that not just adjectives but also verbs can compose semantically with the noun unmodified by the cardinal.

I propose: (I) The semantic building blocks within the DP are what generate the semantic distinction in (3-4). The morphological marking on the verb is thus mere uninterpreted agreement. **(II)** In LA, not only do cardinals not necessarily compose with pluralities, but a DP containing a cardinal, as a whole, is not necessarily semantically plural. This proposal is based primarily on the evidence in (A)-(C):

A- Semantic plurality: Proposal (II) is supported by (4)-(6): When unmarked, the verb is necessarily interpreted as true of singular individuals, despite the presence of a cardinal. In fact, when unmarked, verbs that inherently require a plurality as their subject are ungrammatical: Despite the presence of the

¹All Arabic facts here concern SVO word-order, and are independent of (non-)agreement effects in VSO word-order

cardinal, they fail to find a semantic plurality to compose with. Accounts treating cardinals as modifiers that multiply nouns (Ionin & Matushansky 2006) or as determiners (e.g. Montague 1974) cannot straightforwardly account for the systematic unavailability of a semantically plural DP in those cases.

B- Verbal marking is an epiphenomenon: Since plural-marked adjectives must modify predicates of pluralities in (7b)-(8b), plural marking on adjectives can be used to verify the presence of a semantic plurality in the absence of overt plural marking on the noun. Notably, the presence of any plural-marked adjective requires plural marking of the verb (9a); the converse is not true (9b).

- 9.a. 30 la??iib mnazzamiin le?b-u/*le?eb b. 30 la??iib mnazzamiin/mnazzam le?b-u
 30 player- \emptyset organized-PL played-PL/*- \emptyset 30 player- \emptyset organized-PL/- \emptyset played-PL

C- Adjective ordering: When more than one adjective is present, one can be unmarked while another is plural-marked, but their ordering is restricted: unmarked adjectives are closer to the noun than plural-marked ones (10a-b). This shows that the semantic plurality is outside the noun itself, but inside the DP.

10. 30 telmiiz Tawiil maSfouf-in wesl-u; b.*30telmiiz maSfouf-in Tawiil wesl-u
 30 student- \emptyset tall- \emptyset aligned-PL arrived-PL 30 student- \emptyset aligned-PL tall- \emptyset arrived-PL
 ‘Thirty aligned tall students arrived’ (i.e.: 30 tall students walking in one line arrived)

Formal Proposal: I follow Zabbal (2005) (and to a certain extent Krifka 1990) in assuming cardinals are of type n (rather than quantifiers or modifiers) and that they simply denote the mathematical number itself. I further assume the pluralizing function Γ in (11), which takes a cardinal as its restrictor, composes with a predicate over singulars and results in a predicate over plurals. Since Γ creates a plurality, a phrase containing Γ triggers plural agreement on whatever composes with it.

11. $[[\Gamma]] = \lambda n_n. \lambda N_{et}. \lambda x_e. x$ is non-atomic, x has n atomic parts, and $\forall y: y$ is an atomic part of $x.P(y)$

I assume that a covert quantifier D_E , which takes a restrictor of type n , heads indefinite DPs:

12. $[[D_E]] = \lambda n_n. \lambda N_{et}. \lambda Q_{et}. \exists n\text{-many } x: N(x) \ \& \ V(x)$

13. In the absence of Γ : $[D_E \text{ [fifteen [boy]]}] \text{ [ate-}\emptyset\text{cake}]$

$[[D_E \text{ 15 boy ate a cake}]] = [[D_E \text{ 15 boy}] \text{ ([[ate a cake]])} = 1$ iff $\exists 15 z. z$ is a boy and $[[\text{ate-a-cake}]](z)$
 $\approx \Rightarrow$ There are fifteen individuals x such that x is a boy and x ate a cake

14. In the presence of Γ : $[D_E \text{ } \Gamma \text{ [fifteen [boy]]} \text{ [ate-PL cake}]$

$[[D_E \Gamma \text{ 15 boy ate a cake}]] = [[D_E \Gamma \text{ 15 boy}] \text{ ([[ate a cake]])} = 1$ iff $\exists z. z$ non-atomic, x has 15 atomic parts, and $\forall y: y$ is an atomic part of $z. y$ is a boy & $[[\text{ate a cake}]](z)$

$\approx \Rightarrow \exists$ an individual z such that z is a plurality of size 15, each atom of z is a boy, and z ate a cake

In the presence of Γ , the DP behaves like any other plural individual: both a collective and a distributive reading are available on the verb. This is obtained through either a covert distributive operator in the VP or a cover (cf. Schwartzschild 1996). I follow Schwartzschild in assuming that, given a DP denoting a plurality, $[DP \text{ VP}]$ is true iff there is a salient cover C of this plurality, and VP is true of every element in C . The collective reading is obtained when C consists of the plurality itself. The distributive reading is obtained when C consists of the set of singletons corresponding to the plurality’s atomic parts.

Adjectives have no intervening cover: In the absence of Γ , they can only compose with the noun (15). In Γ ’s presence, they can merge below Γ , compose with the noun, and result in individual modification (15), or they can merge above Γ , compose with the whole ΓP , and result in a modification of the plurality (16).

15. $[[D_E \text{ 15 organized-}\emptyset \text{ boy}]] = [[D_E \text{ 15}] \text{ ([[organized-}\emptyset \text{ boy}]])] = [[D_E \text{ 15}] \text{ ([[organized-}\emptyset] \text{ ([[boy]])}]]]$
 $= \lambda V_{et}. \exists 15 y: [\lambda N_{et}. \lambda x. N(x) \text{ and organized}(x)] (\lambda x. x \text{ is a boy}) (y) \text{ and } V(y)$
 $= \lambda V_{et}. \exists 15 y: y \text{ is a boy and } y \text{ is organized and } V(y)$

16. $[[D_E \text{ organized-PL } \Gamma \text{ 15 boy}]] = \lambda V_{et}. \exists y: [[15 \text{ organized-PL } \Gamma \text{ boy}]](y)$
 $= \lambda V_{et}. \exists y: [[\text{organized-PL}]] ([[\Gamma \text{ 15 boy}]]) (y) \text{ and } V(y)$
 $= \lambda V_{et}. \exists y: y \text{ is a group of 15 boys and } y \text{ is organized and } V(y)$

Crosslinguistic View: Identical facts observed on Basque verbs (cf. Etxeberria & Etxepare, 2008), and on Armenian verbs after cardinals, suggest that the above generalizations are not exclusive to Arabic.