| RESEARCH ARTICLE

# Gemination and Degemination before the Feminine Sound Plural Suffix in Native and Loanwords in Arabic

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| ABSTRACT

This study aimed to explore the gemination of consonants preceding the Feminine Plural suffix /-aːt/ in native and loanwords in Arabic, which consonants are geminated and when they are degeminated before /aːt/, to compare the conditions under which geminated and ungeminated consonants occur before /aːt/; and to define the relationship between the vowels preceding geminate and singleton consonants in syllables before /aːt/. A sample of 70 loanwords and 70 native Arabic nouns and/or adjectives having a Feminine Sound Plural (FSP) form with geminated and degeminated consonants before the suffix /aːt/ was collected from some websites. Data analysis showed that the FSP formation of both native and loanwords in Arabic follows the same Arabic pluralization rules. When a stem ends in a singleton consonant, the feminine plural suffix /aːt/ is directly added in لمسات /lamasaːt/ *touches* & درونات /droːnaːt/ *drones*. Almost all types of consonants can be geminated in word-final position in Arabic. In this case, the suffix /aːt/ is directly added to form FSP as in فلزّات /filizzaːt/ *metals* & لمّات /lammaːt/ *gatherings*. But when the stem ends with a vowel following the geminated consonant, the vowel is deleted as Arabic does not allow the sequence of two vowels (مودات /mawaddaːt/ *affections*). The stops /p, b, k, g/, fricatives /f, ʃ, tʃ, dʒ/ and graphemes {ll}; {lla}, {ette} are geminated in some loan stems before the plural suffix /aːt/ as in كليبات /klippaːt/ *clips*; تريلات /trilla+aːt/ *trailers*; بروفات /proof+aːt/ *professors*; تاتشات /tatʃtʃ+aːt/ *touches*; مانشيتات /manʃitt+aːt/ *manchettes* (headlines). In 48% of the loanwords in the sample, the final consonant of the stem is not geminated before /aːt/ ماركت) /maːrkitaːt/ *markets*( due to the long vowel in a preceding syllable. In loanwords where the stem is feminine singular ending in /a/, this vowel is deleted before /aːt/ as in صالات /Salaːt/ *salles*; كاميرات /kamiraːt/ *cameras*, as it is the case in native Arabic words with stems ending in /a/. No gemination takes place before /aːt/ as there is a long vowel in a preceding syllable. The study concludes with recommendation for language and translation pedagogy and for future research.

| KEYWORDS

Pluralizing loanwords, borrowings in Arabic, Feminine Plural suffix /aːt/, morphological adaptations, gemination before suffix

## 1. Introduction

In phonetics and phonology, gemination[1] is consonant lengthening for a longer period of time than that of a singleton consonant. In many writing systems, gemination is represented by double letters and is often perceived as a doubling of a consonant. Consonant gemination and vowel length are independent in languages such as Arabic, Finnish, Estonian and Japanese. However, Italian, Swedish and Norwegian. Vowel length and consonant length can be interdependent. For example, in Swedish and Norwegian, a geminated consonant is always preceded by a short vowel, while an ungeminated consonant is preceded by a long vowel. In English, there is no word-internal phonemic consonant geminates even when words contain double consonants such as *arrival, approval, account, assessment, communication*. In English, gemination only occurs across word boundary as in *unnatural,*

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[1] https://en.wikipedia.org/wiki/Gemination

*immoral, irrelevant, illegal,* and *that time* and the double letters are pronounced as a single phoneme. In Arabic, gemination is a prominent feature of its phonological system. Geminates or double consonants occur within a word in medial and final positions. In the Arabic orthographic system, gemination is shown by a diacritical mark (shadda شدة ّ ), not double consonants spelled together. The gemination diacritic is placed on top of a single consonant to show that there is a double consonant even though one consonant is spelled. Here the geminated consonant is lengthened and doubled (Al-Jarf, 2022; Al-Jarf, 2007).

Being a distinctive feature of Arabic, the phonetic and phonological aspects of gemination in Arabic local dialects as well as Standard Arabic have been the focus of numerous studies in the literature such as the phonetic and phonological aspects of gemination in Libyan Arabic (Issa, 2016); the phonetics and phonology of assimilation and gemination in rural Jordanian Arabic (Al-Deaibes, 2016); the interaction of stress, syllable structure, and gemination in Jordanian Arabic (Al-Tamari, 2000); geminate weight and length in rural Jordanian Arabic (Al-Deaibes, 2021); a clinical phonetic study of Jordanian Arabic final geminates, whether gemination occurs in word-final position, and whether there is a temporal compensatory relationship between the vowels preceding geminate and singleton consonants (Al-Tamimi, Abu-Abbas & Tarawnah 2010); gemination in Lebanese Arabic (Khattab, 2007); durational cues for gemination in Lebanese Arabic (Khattab & Al-Tamimi, 2008); the gemination effect on consonant and vowel duration in standard Arabic speech (Trigui, Maraoui & Zrigui, 2010); the acoustic and articulatory features of gemination as pronounced by Algerian speakers and the values of frequency formants, energy and durations of the consonants and subsequent vowels in the various [VCV] and [VCgV] utterances (Ferrat & Guerti, 2017); and an experimental study of consonant gemination in Iraqi colloquial Arabic (Ghalib, 1984); constraint in consonant gemination in Moroccan Arabic (Noamane, 2020). Other studies have focused on Arabic emphatic gemination in nouns and verbs (Mugair, 2017); doubling of consonants in Arabic as a morphological issue, that changes the derivational class and the semantics of the verb (El Zarka, 2005); the phonological and morphological patterns of gemination in the causatives, agentive and instrumental nouns in Moroccan Arabic (Noamane, 2021); and how gemination occurs in English and Arabic, it is represented, whether it is restricted to consonants only, whether or it also occur with vowels, and the type of gemination each language exhibits (Mubarak, & Jebur, 2018).

In addition, the literature review showed 3 studies that provided examples with geminated consonants before the Feminine Plural suffixes /a:t/ in loanwords in Arabic. A study by Mushait and Al-Athwary (2020) analyzed 250 loanwords to identify how borrowed nouns from English are inflected for plural and gender in Colloquial Saudi Arabic. They found that foreign nouns are marked for all plural types: Masculine Sound Plural (MSP), Feminine Sound Plural (FSP), and Broken Plural, with 77% of borrowed nouns inflected for FSP. They reported a peculiar feature of FSP formation related to the attachment of –ha:t and –ya:t to singular borrowed nouns and gave few examples of FSP with geminated consonants before the Feminine Plural suffix /-a:/ as /trella/ > /trella:t/ *trailers*; la:btub > /la:btubba:t/ *laptops*; fillah > /filla:t/ *villas*. They did not give any explanation as to why gemination of consonants occurs before the plural suffix /-a:t/.

In an extensive study by Al-Jarf (2024a), a geminated glide /yy/ appears in the plural of native Arabic words as أدبيات /ʔadabiyy+a:t/ literature; بديهيات /badi:hiyya+a:t/ axioms; سمعيات /samʕiyya +a:t/ audio; طفيليات /Tufayliyya+a:t/ *parasites*; عموميات /umumiyya+a:t/ *generalities*; هوائيات /hawaʔiyya+a:t/ *aerials*; لغويات /luɣawiyya+a:t/ *linguistics*; بصريات /baSariyya +a:t/ *optics* and others. Geminated /yy/ also appears before the Feminine Plural suffix /a:/ in plural loanwords used in Arabic as *proxy* انميات بروكسيات /proksiyya:t/ & *story* ستوريات /sto:riyyat/; فلوبيات /flobiyy+a:t/ *floppy disks*; كناريات /kana:riyy+a:t/ *canaries;* /animiyy+a:t/ *Animes*; بيبسيات /pepsiyy+a:t/ *Pepsi(s)*; تروليات /trolliyy+a:t/ *trolley;* راليات /ra:liyy+a;t/ *rallies;* ستوريات /sto:riyy+a:t/ *story;* لوبيات /lu:biyy+a:t/ *lobbies;* لوريات /lu:riyy+a:t/ *Lorries*. Al-Jarf indicate that in native words with a stem ending in the graphemes ى or ي pronounced /a:/ and /i:/, the vowel is shortened and /y/ is added as a liaison consonant as in تمنيات /tmanniya:t/ *wishes;* مديات /maday:at/ *ranges*). When the loan stem ends in يا /ya:/, the final long vowel /a:/ is deleted before /-a:t/ as Arabic phonotactics do not allow a sequence of two long vowels as in بكالوريا /bakalo:rya/ > بكالوريات /bakalory+a:t/ *high school diplomas*. A geminated glide /yy/ appears in the plural of native words as برمجيات /barmadʒiyy+a:t/ software; أدبيات /ʔadabiyy+a:t/ literature; and plural loanwords as سيديات /si:di:yy+a:t/ *CD's;* سيلفيات selfies /selfiyy+a:t/; باربيات /ba:rbi:ya:t/ *Barbies;* سمفونيات /simfo:ni: +y+a:t/ *symphonies.* In these examples, the stem is masculine singular ending in a geminated yy, after which the plural suffix /a:t/ is directly added. A second explanation is that the stem is a feminine singular noun/adjective ending in a geminated yy followed by the grapheme *ta marbouta* ة ـة pronounced /a/ which is deleted when the plural suffix /a:t/ is added, as Arabic does not allow the sequence of two vowels. The vowel preceding the geminated glide yy is shortened in the FSP of native and loanwords in Arabic.

In another study, Al-Jarf (2023) gave few examples of FSP's with geminated stop consonants before the Feminine Plural suffix /a:t/. The final consonant /k/in the stem is geminated before the Feminine Plural suffix in *click* كليكات /klikka:t/ & *Facebook* فيسبوكات /feysbukka:t/; when the final consonant of the stem is a /p/as in *clips* كليبات klippa:t/; consonant /b/as in *WhatsApp* واتس أبات /watsʔabba:t/ and groups جروبات /grubba:t/. The /p/ in *groups* and *WhatsApps* is pronounced /b/ by some Arabic speakers as the phoneme /p/ does not exist in the Standard Arabic phonological system. As in the previous examples with plosives, Arabic speakers are applying the same Arabic phonotactic rules to words that are analogous to Arabic words (Al-Jarf, 1994b; Al-Jurf, 1994).

The gemination and degemination of consonants before Arabic plural suffixes, i.e., the dual suffixes, the Masculine Sound Plural (MSP) suffixes and the Feminine Sound Plural (FSP) suffix in native and loanwords in Arabic, have not been extensively examined by prior studies in the literature. Therefore, this study aims to explore the gemination of consonants preceding the Feminine Plural suffix /-a:t/ in native as well as loanwords in Arabic, which consonants are geminated and when they are degeminated before the Feminine Plural suffix /a:t/. It also aims to compare the conditions under which geminated and ungeminated consonants occur before the feminine suffix /a:t/ in plural forms of native Arabic words, whether in Standard Arabic or in Arabic dialects and in loanwords from other languages. In addition, It aims to define the relationship between the vowels preceding geminate and singleton consonants before the Feminine Plural suffix /a:t/.

This study is synchronic as it shows examples of FSPs of loan nouns with geminated and degeminated consonants before the feminine suffix of FSP forms of loanwords in Arabic. It is also diachronic as it sheds light on FSPs of native Arabic words that have existed for centuries and trace their historical development and whether geminated and degeminated consonants in native and loan nouns occur in native and loan stems with the same features.

This study is significant as it is part of a series of studies by the author on the morphological adaptations that take place in pluralization of loan words in Arabic and the acquisition and translation of English and Arabic plurals as FSP endings in /ya:t/ and /yya:t/ in native and loan lexemes in Arabic (Al-Jarf, 2024a); FSPs with /h+a:t/ in native and borrowed words in Arabic (Al-Jarf, 2024b); pluralization of social media loan terminology in colloquial Arabic (Al-Jarf, 2023); difficulties in learning English plural formation by EFL college students (Al-Jarf, 2022b); Issues in translating English and Arabic plurals (Al-Jarf, 2020b); and plural acquisition by EFL freshman college students (Al-Jarf, 2006).

## 2. The Feminine Sound Plural in Arabic

Arabic has 4 plural types: the FSP, the MSP, Dual and BP. The FSP is a regular plural that is formed by adding the Feminine Plural suffix /-a:t/ to feminine singular nouns and adjectives and even some singular masculine whether the feminine singular nouns are animate or inanimate, human or inhuman as in معلمات *female teachers* (animates); دجاجات *hens* (animal); عربات *carriages* (inanimate); لقاءات *meetings (masculine singular)*; استعدادات *preparations (masculine singular)*; حصوات *canes; عصوات stones, pebbles; sticks*; مسيرات *drones;* مطبوعات *printed matter;* مواصفات *specifications.* Some FSP have no singular form as مجوهرات *jewellery;* بيانات *data;* كيماويات *chemicals;* صوتيات *phonetics,.* Some nouns have both a FSP and a Broken Plural called plurals of paucity, multiplicity and/or genus as تمرينات *a number of exercises,* تمارين *exercises;* بيوتات *houses;* بيوت *houses,* أبيات *lines of verse,* صحراوات *deserts ( plural of paucity).* Some FSP forms are polysemous, i.e., have several meanings vis مرئيات *views on something, objects that we see, visuals.* Some have two Feminine Plurals, each having a different usage: اقتصاديات *economics,* اقتصادات *economies;* سلوكات *behaviors,* سلوكيات *behavior, conduct*; (Al-Jarf, 2020b; Al-Jarf, 1994a; Al-Jarf, 1994c; Al-Jurf, 2002).

In addition, borrowed nouns in Standard Arabic and/or Arabic dialects generally take the FSP whether the singular form is masculine or feminine, animate or inanimate, with few exceptions taking the MSP, the BP, or no plural. Examples of commonly used FSP of loanwords are بلاجات *plages;* اكسسوارات *accessories;* هرمونات *hormones* ; بلاتفورمات *platforms;* اكسيدات *oxides* ; صالات *reportages;* ريبورتاجات *decors;* ديكورات *deones;* درونات *tactics;* تكتيكات *boulevards;* البولفارات *boutiques;* بوتيكات *(Fr)/beaches;* بارومترات *parachute;* باراشوتات *terminal (Eng);* سناكات *snacks;* فولارات *foulards (Fr);* سبايكات *spikes;* سالات *salles (It, Fr);* بُوليمرات *polymers;* ديناصورات *dinosaurs;* بروتوكولات *protocols;* تليغرافات *telegraph;* ترمومترات *thermometer;* فازات *vases;* فيتامينات *vitamins;* ديـنُـوصُّـورات *computers;* كمبيوترات *carburettors* كربوريتورات *catalogs;* كتالوجات *phonographs;* فونوغرافات *grams;* جرامات *caricatures;* كاريكاتورات *garages;* جراجات *neutrons;* نيوترونات *links;* لينكات *live;* لايفات *commission;* كوميسيونات *creams;* كريمات *electrons;* الكترونات *viruses;* لمبات *lamps;* ماكياجات *make-ups;* هيليكبترات *heliocopters;* كاونترات *counters;* تلفزيونات *televisions;* مليونيرات *millionaires;* مرسيدسات *Mercedes cars;* موتوسيكلات *motorcycles;* طوربينات *turbines;* بوتيكات *boutiques;* كاميرات *cameras;* ميكروسكوبات *microscopes;* مونولوجات *monologues;* مليارديرات *Milliardaires (Fr);* ميكروفونات *microphones;* ميداليات *medals;* سبايكات *spikes;* فيديوهات *videos;* سيناريوهات *scenarios* (Al-Jarf, 2011; Al-Jarf, 1990). مانشيتات *manchettes;* بلاجات *plages* (Fr); طوربيدات *torpedos;*

## 3. Data Collection and Analysis

A sample of 70 loanwords having an FSP ending in geminated and degeminated consonants before the feminine suffix /a:t/ was collected. The loan nouns were borrowed from English, French, Italian, Turkish, and Greek. The second sample consisted of 70 native Arabic nouns and/or adjectives having an FSP ending with geminated and degeminated consonants before the Feminine Plural suffix. Both samples were collected from some websites such as:

- كلمات أعجمية نستخدمها باللغة العربية
- (arsco.org) معجم لعض الكلمات الدخلة ومقابلاتها بالعربية
- http://arabicencywords.blogspot.com/2021/08/blog-post_43.html
- https://al-maktaba.org/book/31862/17466
- http://kalimmat.com/starts-with/yaaalftaa/1/1/1/

- http://wordsarabic.com/words.تنتهي-ات/html

All the loanwords are nouns and single words. No compounds, abbreviations or acronyms were included.  Singular underivable nouns ending in /a:t/ and having no plural form such as شتات *diaspora;* and underivable هيهات '*I wish it would*' were not included in the sample. FSP's of containing /y/ and /yy/ before the Feminine Plural suffix /a:/ were not included in the current sample as they were extensively researched in another study by the author (Al-Jarf, 2024).

The native words in the sample have singular stems that are nouns and adjectives, refer to animate and inanimate, human and inhuman, are used in Colloquial and/or Standard Arabic, and general and specialized contexts. They are all single words that are spelled and pronounced in isolation.

The author made a list of all the native Arabic words and another of all the loanwords. The environments in which the geminated consonants occur before the Feminine Plural suffix /a:t/ in words on both lists were analyzed. Words on the Arabic list were categorized according to the final consonant of the singular stem, whether the stem is a noun or an adjective as adjectives in Arabic are also marked for number and gender.  The final consonants in the stems were analyzed into geminated stops /t, d, k, g/, fricatives /f, v, θ, ð, s, z, ʃ, dʒ, h/, nasals /n, m/, laterals /l/, approximants /l, r, y, w/ and trills /r/.

On the other hand, loanwords were categorized according to the pronunciation of the final phoneme/grapheme of the singular stem before the Feminine Plural suffix /a:t/. The final consonant in the loan stems was also analyzed according to the source language from which the words were borrowed.

The author verified all FSPs of the loanwords in the sample by searching for each plural form in Google. In addition, the analysis was verified by two professors of Arabic and Linguistics. Disagreements were solved by discussion.

## 4. Results
### *4.1 Gemination in Arabic Feminine Sound Plural before the Suffix -a:t*
Analysis of the FSP forms of native Arabic words containing a geminated consonant before the Feminine Plural suffix /a:t/ showed that in 47% of the Arabic words with FSP in the sample, the stem is singular feminine (36) ending in almost all kinds of geminated final consonant:
- **Stops:** هبات /habba:t/ *gusts* ; صبات /Sabb:t/ *concrete casts* ; فكات /fakka:t/ *change*; معدات /muʕidda:t/ *equipment*; شدات /ʃadda:t/ *wrenches*; مدات /madda:t/ ; مسبات /masabba:t/ *swearing* (pl); فتة فتات /fatta:t/ *bread pieces in broth*; مودات /mawadda:t/ *affections* ; خبّات habba:t/ *pieces*; تكات /takka:t/ *clock ticks* ; عدات /?addat:t/ *counts*; جدات /dʒadda:t/ *grandmothers*.
- **Nasals:** مسنات /misanna:t/ *old ladies*; لمات /lamma:t/ *gatherings*; عمات /?amma:t/ *aunts*; شمّات /ʃamma:t/ *sniffs*; جنات /dʒanna:t/ *paradises*; مُعنفات /muʕannafa:t/ *rebuked women*; رنات /ranna:t/ *rings*; انات /?anna:/ *moaning* (pl).An exeption is أم /?umm? which has two plurals forms امات /?umma:t/ & امهات /?ummaha:t/ *mothers*. The former is used for *animal mothers* and the latter is used for *human mothers*.
- **Approximants (l, r, y, w)** سلات /sallat:/ *baskets*; قوّات /quwwa:t/ *armed forces*; نيات /niyya:t/ *intentios*; حيات /Hayya:t/ *snakes*; مرات /marra:t/ *several times*.
- **Fricatives/affricates (f, v, θ, ð, s, z, ʃ, dʒ, h):** هفات /haffa:t/; هزات /hazza:t/ *tremours*; لفات /laffa:t/ *rolls* زفات /zaffa:t/ *bridal processions*; حرّات /harra:t/ *lava(s)*; بحات /baHHa:t/ *Hoarseness(es)*; زخات /zaxx+a:t/; ملذات /malaðða:t/ *pleasures*.
- **Alveolar ejective** ط /T/: بطات /baTTa:/ *ducks*.
- **Dental ejective fricative** ظ /ðˤ/: فظات /faðˤðˤa:t/ *rough* (f, pl), rude (f, pl).
- **Alveolar ejective fricative or affricate** ص /S/: مصات /maSabba:t/ *sucks*.
- **Alveolar lateral ejective fricative or affricate** ض /D/: عضات /?aDDa:t/ *bites*.
- **Velar ejective** ق /q/: دقات /daqqa:t/ *beats*.

In the above examples, the stem is singular feminine ending in a geminated consonant followed by the grapheme تاء مربوطة ta marbouta ة ـة in word final position which is (pronounced /a/ in Spoken Arabic.  When the FSP suffix /-a:t/ is added to the feminine singular stem دقة /daqq+a/, the final vowel /a/ in /daqq/ is deleted before the suffix /-a:t/ > daqq + a:t >/daqq+a:t/ as Arabic does not allow the sequence of 2 vowels. The geminated consonant is split into 2 consonants: one remains in the stem and the other combine with /a:t/.

In 11%, the Arabic words in the sample,   the stem is a singular masculine noun with final geminated consonants  as in فلزّات /filizza:t/ *metals*; مشدات /maʃadda:t/ ; مَصتّات /maSabba:t/ *river mouths*; ممرّات /mamarra:t/ *passages, paths*; ستات /sitta:t/ *ladies*; مضادات /muDa:dda:t/ *anti-biotic, anti-aircraft*; مطب > مطبات /maTabba:t/ *humps, pitfalls*; ملفات /malaffa:t/ *files*. Here the Feminine Plural suffix /a:/ is directly added to the stem. The plural form has a geminated consonant as the singular form.

In 48% of the Arabic words in the sample, the FSP forms have no geminated consonant before the plural suffix /a:t/, whether the stem is a feminine singular with a short vowel, a feminine singular with a long vowel or a masculine singular as in the following examples:

- FSP's with feminine singular stems with a short vowel as in لمسات /lamasa:t/ *touches*; بصلات /baSala:t/ *onions*; بطلات /baTala:t/ *lady champions*; وصفات /waSafa:t/ *prescription, recipe*; وصلات /waSla:t/ extensions; عملات /ʕumla:t/ *currencies*; عضلات /ʕaDala:t/ *muscles*; فتحات /fataHa:t/ *openings*; منسقات /munassiqa:/ *female coordinators*.
- FSP's with feminine singular stems with a long vowel as in عصابات /ʕiSa:ba:t/ *gangs* هيافات /haya:fa:t/ *trivials*; ديانات /diya:na:t/ *religions*; بشارات /biʃa:ra:t/ *tidings*; قصاصات /quSa:Sa:t/ *scraps*; بيانات /baya:na:t/ *data*; بلاطات /bala:ta:T/ *tiles*.
- FSP's with Masculine Singular stems as in مستندات /mustanada:t/ *documents*; هتافات /huta:fa:t/ *cheers*; دهانات /diha:na:t/ *paints*; بخاخات /baxxa:xa:t/ *sprays*; صمامات /Samma:ma:t/ valves; ملاذات /mala:ða:t/ *refuge*(s); مثلثات /muθallaθa:t/ *triangles*.

### 4.2 Gemination in Loanwords before the plural suffix /a:t/

Results of the analysis of loanwords used in Arabic have shown that the FSP with a geminated consonant before the Feminine Plural suffix /a:t/ appear in the following environments:

In 22% of the FSP loanwords in the sample, the stem ends in the stops /p, b, k, g/ although the final stop is a single consonant as in جروبات /blogga:t/ *blogs* بلوكات /blokka:t/ *blocks*; تريكات /trikka:t/ *tricks*; توبات /tobba:t/ *tops*; جاكيت /dʒakitta:t/ *jackets*; بلوجات /blogga:t/ *blogs* كليكات /grubba:t/ *groups*; جلوبات /globba:t/ *light bulbs*; سبليتات /splitta:t/ *split AC* فلوجات /flogga:t/ *flogs*; كليبات /klippa:t/ *clips*; كليكات /klikka:t/ *clicks*; فيسبوكات /feysbukka:t/ *Facebook (s)*; مجات /mugga:t/ *mugs*; ميدات /midda:t/ *midterm tests*; واتس أباتات /watsabba:t/ *WhatsApp (spelled with a double pp)*; جيبات /dʒibba:t/ *jeeps*; ميك أبات /meikuppa:t/ *makeups*. In all of these examples, Arabic speakers are assuming an underlying geminated stop consonant at the end of the singular stem ending in a stop consonant. Also, all the syllables in the stem before the suffix /a:t/ have a short vowel, i.e., the suffix /a:t/ is the only syllable with a long vowel.

In 11% of the loanwords in the sample, the stem ends with a geminated lateral grapheme /ll/ in دريلات /drill+a:t/ *drills*; كارتيلات /kartell+a:t/ *cartels;* or /lla/ in some Arabized nouns تريلات /trilla+a:t/ *trailers*; جونلات /gonilla+a:t/ *gonella* (It); غوريلات /ɣurilla+a:t/ *gorillas*; Arabized noun فانيلات /fanilla+a:t/ *flannels*; فيلات /villa+a:t/ *villas*; كريلات /karilla+a:t/ *kerellas, bitter gourd*. As in native Arabic words with a feminine singular stem followed by a final /a/, this final /a/ is deleted when the suffix /a:/ is added as Arabic does not allow the sequence of two vowels. But in stems ending in the grapheme ll, /a:t/ is directly added.

As in the Arabic examples, 10% of the loanwords end in fricatives and approximate consonants as in اوفات /offa:t/ *days off*; نطقين /proof+a:t/ *profs, professors*; تاتشات /tatʃt+a:t/ *touches*; جي بي اسات /dʒi: pi: ?iss+a:t/ *GPS's* كلاتشات /klutʃt+a:t/ *clutches*; دوشات /duʃʃ+a:t/ *douches* (Fr). Here, Arabic speakers assume a geminated final fricative or approximate. Here, the plural suffix /a:t/ is directly added, but the final geminated consonant is split into 2: one remains with the stem and the other is attached to the suffix.

In 6% of the loanwords, the stems end in -ette as they were borrowed from French. The double consonants in these words are geminated in French. In addition, when Arab speakers see double consonants, they intuitively pronounce the word with a geminate as in مانشيتات /manʃitt+a:t/ *manchettes (headlines)* اوبريتات /oparitt+a:t/ *operettas* (It); اومليتات /omlitt+a:t/ *omelettes* (Fr); الروليتات /rolett+a:t/ *roulettes* (Fr) (wheels); مانشيتات /manʃitt+a:t/ *manchettes (headlines)*.

In 4% of the loanwords, the stem ends with a final vowel as in أنتينات /?antenn+a:t/ antenna (Fr); antenna (Eng); كرافتة /karavatt+a:t/ cravat. Here, the final vowel in the stem is deleted when /a:t/ is added as the Arabic phonotactics do not allow a sequence of two vowels.

On the contrary, in 48% of the loanwords, the final consonant of the stem is not geminated before /a:t/. In this case, the loanword is pluralized by simply adding /a:t/ as in جيبات /dʒi:ba:t/ *jupes* (Fr); باراشوتات /baraʃu:ta:t/ *parachute* (Fr); ماركت /Ma:rkita:t/ *markets*; باكتات /bakita:t/ *packets*; سكوبات /sku:ba:t/ *scoops*; سندويشات /sa;ndwiʃa:t/ *sandwiches* براندات /branda:t/ *brands*; تكتيكات /taktika:t/ *tactics*; كابلات /ka:bla:t/ *cables*; فايلات /fayla:t/ *files*; ايبادات /?aypada:t/ *iPads*; لايكات /lauka:t/ *likes*; لينكات /linka:t/ *links*; اكاونت/akawnta:t/ *accounts*; كابات /kapa:t/ *caps*; كلاشات /klaʃa:t/ *clashes*; اوردرات /o:rdera:t/ *orders//*; هيلوكبترات /hilokabtara:t/ *helicopters*; درونات /dro:na:t/ *drones* شيفتات /ʃifta:t/ *shifts;* روبوتات /rubuta:t/ *robots*. موديلات /modela:t/ *models; baristat /ba:rista:t/;* بروتينات /pro:ti:na:t/ *proteins*; سبايكات /spayka:t/ *spikes;* مكياجات /mikyadʒa:t// *macquiages;* بلاستيكات /blastika:t/ *plastics;* سناكات /snaka:t/ *snacks*; فترينات /vatri:na:t/ *vitrines* ; اوردرات /o:rdara:t/ *orders*.

Even in loanwords in which the stem is a feminine singular noun ending in the vowel /a/ as in صالات /Sala:t/ *salles*; كاميرات /kamira:t/ *cameras*, this vowel is deleted before the plural suffix /a:t/ as it is the case in native Arabic words with a singular feminine stem

ending in the singular feminine suffix /a/. No gemination of the consonant before the suffix /a:t/ as the final consonant in the stem is not geminated.

Although the loanword *princess* ends with a double ss in the English singular form, the plural برنسيسات /prinsisa:t/ *princesses* in Arabic is pronounced with a single s because the singular feminine suffix/a/ is added to the stem in Arabic برينسيسة /prinsi:sa/ *princess*. However, the pluralization process of /prinsi:sa/ is the same as that of similar singular feminine stems ending with ta marbouta pronounced /a/. Here the final /s/ in the stem is not geminated because the stem contains a long vowel preceding the final consonant.

As for اوتيلات /ʔotela:t/ *hotels,* some Arabic speakers pronounce it with a geminated final /ll/ before the suffix /a:t/, others pronounce it with a singular /l/. In the plural with a geminated /ll/, all the preceding vowels are short, whereas in the plural with a singular /l/ the preceding syllable has a long vowel.

Likewise, Arabic speakers pronounce باصات *buses* in two ways: with the geminated emphatic consonant /SS/ before the suffix /a:t/ in /baSSa:t/, and with a single consonant /S/ in /ba:Sa:t/. This depends on the length of the vowel in loanword *bus*. Those who geminate the final consonant /SS/, shorten the vowel in *bus*, i.e., pronounce it like English, whereas those who pronounce the plural with a single consonant lengthen the vowel in *bus*, i.e., they say /ba:S/, which is the Arabized form.

## 5. Discussion and Conclusion
Results of the current study showed that Arabic speakers pluralize native and loanwords according to the Arabic language pluralization rules. When stems are singular nouns or adjectives ending in a geminated consonant that is an integral part of the stem, the plural suffix /a:t/ is directly added as in native words, i.e., the plural form has a geminated consonant before the plural suffix /a:/. In loanwords ending in stops, lateral or approximant consonants or the final graphemes {ette}, {ll} or {lla}, the consonants preceding the plural suffix /a:/ are geminated. When the stem ends in a vowel as /a/, it is deleted before the suffix /a:/ in the plural form.

These findings are consistent with findings of prior studies by Al-Jarf (2024) who found that a geminated glide /yy/ appears in the plural of native Arabic words as أدبيات /ʔadabiyy+a:t/ *literature*; برمجيات /barmadʒiyy+a:t/ *software*; أولويات /ʔawlawiyya+a:t/ *priorities*; بديهيات /badi:hiyya+a:t/ *axioms*; تسعينيات /tisʕi:niyya+a:t/ *nineties*; رباعيات /ruba:Iʕiyya+a:t/ *quartettes* and others. Geminated /yy/ also appear before the Feminine Plural suffix /a:/ in plural loanwords used in Arabic as باربيات /ba:rbi:ya:t/ *Barbies;* سمفونيات /simfo:ni:ya:t/ *symphonies; galleries* غالريات /galariyya:t/; *emojis* ايموجيات /imo:dʒiyya:t/ and others. As in the current study, when the stem ends in vowel /a/, it is deleted when the suffix /a:t/ is added, because Arabic does not allow the sequence of two vowels. The vowel in the syllable preceding the geminate yy is shortened in the FSP form of native and loanwords in Arabic. In another study, Al-Jarf (2023) gave few examples of FSP's with geminated stop consonants before the suffix /a:t/ when the final consonant is a stop consonant like /p, b, k, g/ and occurring before the suffix /a:t/ in *click* كليكات /klikka:t/; *Facebook* فيسبوكات /feysbukka:t/; *clips* كليبات /klippa:t/; *WhatsApp* واتس أبات /wats?abba:t/ and groups جروبات /grubba:t/; and *blogs* بلوجات /blogga:t/. Arabic speakers are applying the same Arabic phonotactic rules to words that are analogous to Arabic words.

In addition, findings of this study are partially consistent with Mushait and Al-Athwary (2020) gave few examples of FSP with geminated consonants before the Feminine Plural suffix /-a:/ as /trella/ > /trella:t/ *trailers*; la:btub > /la:btubba:t/ *laptops*; fillah > /filla:t/ *villas*. However, they did not give any explanation why gemination of consonants occurs before the plural suffix /-a:t/.

The FSP of loanwords بلوكات /blokka:t/ *blocks*; تريكات /trikka;t/ *tricks*; توبات /toppa:t/ *tops*; جاكيتات /dʒakitta:t/ *jackets*; سبليتات /splitta:t/ *split ACs*; فلوجات /flogga:t/ *flogs*; مجات /mugga:t/ *mugs*; ميدات /midda:t/ *midterm tests*; جيبات /dʒibba:t/ *( jeeps)* are analogous to and rhyme with FSP of the native Arabic words هبات /habba:t/ *gusts* ; لمات /lamma:t/ *gatherings*; صبات /Sabb:t/ *concrete casts*; فكات /fakka:t/ *change*; /muʕidda:t/; شدات /ʃadda:t/; مدات /madda:t/ v*owel lengethening*; مسبات /masabba:t/ *swearing* (pl); فتة فتات /fatta:t/ *bread pieces in broth*; مودات /mawadda:t/ *affections*; حبّات habba:t/ *pieces*; تكات /takka:/ *clock ticks*; عدات /ʔaddat:t/ *counts*; جادات /dʒa:dda:t/ *serious* (f, pl); سلات /sallat:/ *baskets*; قوّات /quwwa:t/ *armed forces*; نيات /niyya:t/ *intentions* .

Moreover, when geminating the final consonant of the stem in in the FSP of loanwords in Arabi, Arabic speakers are following the phonotactics of the Arabic language. In this respect Saiegh-Haddad, Hadieh and Ravid (2012) indicated that the FSP formation of loanwords is affected by familiarity with the singular noun stem. Hamdi (2017) emphasized that speakers follow a form that is standardized by Modern Standard Arabic or that enforces another form following their dialects and community conventions. Consistency in assigning numbers and gender to loanwords by applying native patterns motivated by frequency of use and the semantics of the referents.

Adult Arabic speakers and even children pluralize Arabic words intuitively and spontaneously. They follow a form that is standardized by Arabic or enforce another form following the pluralization rules of their local Arabic dialects. There is consistency in assigning number and gender to loanwords by applying native patterns motivated by the frequency of use and the semantics of the referents (Hamdi, 2017). Al-Saidat (2011) added that English words undergo changes when used as loanwords in Jordanian Arabic so that they do not to violate the phonological and morphological systems of Jordanian Arabic. Thus, all processes of duality and pluralisation are not foreign ones. They follow the native language phonology and morphology which play the role of the governor in plural formation of borrowed words. The English language number system is abandoned as no examples of English plural marker were found in the data. This means that, English loanwords in Jordanian Arabic can be considered as borrowed items rather than codeswitches as they follow the Arabic language phonological and morphological systems rather than the English system.

To help language, translation and linguistics students of all levels find the plural form of loanwords borrowed in Arabic, this study recommends that a monolingual and/or bilingual plural dictionary of loanwords in Arabic be compiled to show students which loanwords have a FSP, which ones have a MSP, which ones have no plural and which ones have two plurals together with their meanings. The loanword plural dictionary can be online or in the form of an app. The students can also compile their own categorized loanword plurals lists in Arabic, Arabic FSP and English plurals for comparison purposes. Student translators may receive training in translating foreign plurals and substituting them by native Arabic words and plurals (Al-Jarf, 2022c; Al-Jarf, 2020a; Al Jarf, 2014; Al-Jarf, 2022a; Al-Jarf, 2006).

Finally, other aspects of loanword morphology such as loanwords that have two plurals have not been fully explored yet. In addition, studies that show how Arabic plural words borrowed in other languages are morphologically adapted in English, Spanish, French, Farsi, Turkish, Bahasa, Urdu and others and whether they retain their Arabic plural form or not are still open for further investigation by future studies (Al-Jarf, 2009; Al-Jarf, 2021).

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