FRACTIONAL PROPORTIONAL PARTITIVES (FPP). FOCUS ON THE VARIATION IN "ONE IN THREE" PARTITIVES AND AGREEMENT

Iman Al Siyabi
Eötvös Loránd University, Budapest;
University of Technology and Applied Sciences, Muscat
https://orcid.org/0009-0003-3623-0959

Maris Camilleri
University of Essex
https://orcid.org/0000-0001-8420-8084

Anne Tamm
Károli Gáspár University of the Reformed Church in Hungary
https://orcid.org/0000-0002-5804-0174

Abstract

This exploratory paper presents a new and understudied type of partitives, the "Cardinal Numeral 1 Preposition/Case Cardinal Numeral 2" partitive structures (e.g., "one in three", "egy (a) háromból / háromból egy" in Hungarian). It proposes the term *fractional proportional partitives* (FPP) and examines variation in types (from, in, of) and subject agreement. That is, whether "one in N2" triggers only grammatical agreement, such as *one in N is*, or allows also for semantic agreement, such as *one in N are*. The data are primarily from varieties of Arabic. The Arabic dual agreement, "two of N2", is also presented. Two pilot surveys and an elicitation-based study clarify the nature of FPPs, whereby Maltese, Standard, Gulf and Tunisian Arabic are the focus. Forays are made into other unrelated and geographically distant languages of the world. The first survey establishes that there is variation in the subject–verb agreement within FPPs among Arabic speakers of different varieties and Arabic speakers of English. A supplementary elicitation study of Hungarian, Khmer, and Burmese serves to establish the typological variation in the "from" (separative), "in" (locative),

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and "of" (possessive) types in FPPs. The second survey adds more typological diversity to the database, whereby it becomes clear that while the possessive "of" strategy is not used for FPPs with this method, the separative "from" strategy is predominant. The locative strategy can further be divided into a container "in" strategy and a surface "on" strategy. Genealogically and areally distant languages may employ similar FPP strategies. Any sort of correlation between the strategies and agreement types did not emerge clearly in the dataset, thus the causes for agreement patterns could be sought elsewhere. The study additionally reflects upon several methodological considerations, particularly the use of typological questionnaires and elicitation in the study of FPPs and agreement.

Keywords: variation and typology; part–whole relationships in fractions and proportions; partitivity marking of subset and superset; prepositions, adpositions; singular, dual and plural agreement; semantic and grammatical agreement

1. Introduction

This study[1] has originally started with a puzzle from a "mistake" in learning English subject–verb agreement, where the phrase "one in three" triggers plural ("one in three *are*") instead of the "correct" singular ("one in three *is*") agreement. When searching in the search engine Google for the phrase "one in three", Google users were not certain between the two forms: *one in three is* or *are*. This possibly English L2 puzzle is in itself an interesting linguistic feature. Hence the example has led to a more detailed study of the structures where the expression of the type "one in three" belongs to.

In this paper, we propose the term *Fractional Proportional Partitives* (FPP) for the "N1 in N2" partitive structures (e.g., "one in three") and a working definition of it. N stands here for "numeral" (the term "number" refers here to grammatical number: the singular, dual, and plural number), a cardinal numeral. FPPs are generic linguistic patterns capable of expressing any fractional

[1] We are grateful to Réka Hajner and Kata Kubínyi for their editorial work on this chapter. The work of Katalin Hegyi as copyeditor has been invaluable. Our heartfelt thanks go to the anonymous reviewers of this chapter for insights and the clarification of Arabic and Hungarian data. We are deeply grateful to Sizet Ven, Nour Ben Braham, Yosha Alabdullah, Dorottya Szabó-Kovács, Wai Yan Min Oo, Rita Brdar-Szabó, Kata Kubínyi, Gabriella Tóth, Nikolett F. Gulyás (an early version of this paper was written as her typology course assignment), and Zakariaa Nini for the data elicitation sessions and to Najah Jellali for distributing the survey on agreement. We thank the EMLEX students and the Intercultural linguistics doctoral school students, who filled out the questionnaire, and the audiences of the PARTE workshop in Budapest in 2022 and PARTE online talks in 2023. All mistakes are ours. Iman Al Siyabi acknowledges the support of Stipendium Hungaricum, and Anne Tamm is grateful for the support of the research grant obtained from the Faculty of Humanities and Social Sciences, Károli Gáspár University of the Reformed Church in Hungary (Theoretical and Experimental Research in Linguistics, reg. no. 20736B800) to this paper.

proportional part of a whole with numerals in a given language. This generic pattern for English consists of a cardinal numeral, the preposition "in", and another cardinal numeral: "N.card1 in N.card2". A pilot survey study on the variation of the English partitive expression "one in three" in Arabic (Afro-Asiatic, Semitic branch) and Arab speakers of English will be presented.

Our test sentences were:

(1) a. *only one in three are lucky to get it*
b. *only one in three is lucky to get it.*

The survey was conducted to establish the variation in agreement within partitives in first language and second language use.[2] An additional elicitation task explores the variation in more detail to see how the variation that emerges in the FPP structures as well as subject–verb agreement patterns among Arab speakers of Arabic and English fits into a typologically larger sample. The structures "one in N" *is* or *are* are studied, and the dual agreement is also briefly described. Finally, a larger sample of the world's languages is collected. See Appendix 1 for the research design of this article.

The objective of this study is to answer two main questions. The first question is: Is there the same variation in the subject–verb agreement in "one in three" in Standard Arabic, Gulf Arabic, Tunisian Arabic and Maltese as in English? And the second question is: What are the types of FPP partitive structures in the languages of Europe, in the Arabic speaking regions and in the world, based on the data sample?

Therefore, this paper is structured as follows: Chapter 2 discusses the FPPs and the research objectives. Chapter 3 outlines the methodology. The results are presented in Chapter 4. Chapter 5 is devoted to the analysis and discussion of the findings. Limitations that should be considered are in Chapter 6. Lastly, Chapter 7 ends up with the conclusion.

2. FPPs and the research objectives of this paper

2.1 Conceptualizing the structures within partitives (Part–whole relationships)

Seržant defines "partitives" as structures that can convey the proportional relationship between a subset and a superset.[3] The superset is the whole in the part–whole relationship, and the subset is a part of the whole. Subsets thus

[2] Due to the colonization of some Arab countries by Great Britain in the past, English is frequently seen as the most dominant foreign language or second language L2, in most Arab nations: M. Jihad Hamdan – Wafa A. Abu Hatab: English in the Jordanian Context, *World Englishes* 28 (2019), 394–405.

[3] Ilja Seržant: Typology of partitives. *Linguistics* 59 (2021), 881–947.

correspond to parts and supersets correspond to wholes. The question that should be raised here is the following: How do these terms apply to part–whole relationships of the type in "one in three"? In the constructions of "one in three", the "part" is "one", and the whole is "three". Thus, the "part" ("one") is the so-called subset of "three". "Three" is the "whole" in this construction, and the so-called superset in this specific partitive expression.

It has been shown that various partitive constructions cross-linguistically exhibit different features in their syntax while displaying different morphological markings.[4] Some languages have partitive pronouns, such as Italian, German or Dutch.[5] A dedicated partitive case may occur, as in Uralic, but researchers have argued that the form and the meaning referred to by the same terminology do not match. Partitives that are associated with the meaning of part–whole in the Uralic languages are expressed in three main ways, namely as juxtaposed bare nouns, ablatives- (or elatives), or possessive structures.[6] The Finno-Ugric case that bears the name "partitive" is only marginally used for expressing the strictly partitive relational meaning of subsets and supersets.

Partitives are cross-linguistically diverse due to their highly abstract nature, which is open to much interpretation. Neither abstract nor concrete objects compose wholes and are divisible in parts by themselves. Consequently, languages differ as to how parts and wholes are conceptualized. There are three grammaticalization paths known for partitives, based on literature on conceptualizations or strategies.[7] One way of conceptualizing parts and wholes relates the whole to a source (Strategy 1, separative or source grammaticalization strategy). Wholes (in other terminology, supersets) are perceived as sources, and the parts (in other terminology, subsets) are moved and separated from their original source.[8] Another way to conceptualize parts and wholes is in terms of containment (Strategy 2, locative grammaticalization strategy). Wholes or supersets are then perceived as containers that contain the parts or subsets that are inside, being static. In addition to the locative and separative strategies, there is another widespread strategy for conceptualizing part–whole relationships: Strategy 3, the possessive strategy. In the possessive strategy,

[4] See Silvia Luraghi – Petra Sleeman (eds.): *Crosslinguistic variation in partitives*, 2023, 1–27. https://doi.org/10.1075/lv.21020.lur

[5] For further reference, see various works by e.g., Cardinaletti and Giusti 2018, Carlier and Lamiroy 2014, Glaser 1992, Ihsane and Stark 2020, Luraghi et al. 2020, Luraghi and Huumo 2014, Sleeman and Giusti 2021, Sleeman and Luraghi 2023, Selkirk 1977, Strobel 2017 etc.

[6] Gabriella Tóth – Kata Kubínyi – Anne Tamm: Possessive partitive strategies in Uralic: Evidence from Mari and Hungarian quantifiers and inflected adpositions, in E. Glaser – P. Sleeman – T. Strobel – A. Tamm (eds.): *Partitive constructions and partitive elements within and across language borders in Europe (LiVVaL – Linguaggio e Variazione. Variation in Language 3),* Venice, Edizione Ca'Foscari, 101–126.

[7] As described by Silvia Luraghi – Tuomas Huumo (eds.): *Partitive cases and related categories*, Berlin, De Gruyter Mouton, 2014.

[8] Luraghi–Huumo (eds.): *Partitive cases and related categories*.

wholes are conceptualized as possessors and parts are conceptualized as possessed items. Section 4.3 adds a "similative strategy".

We will refer to the first way of conceptualization as the separative or *from*-strategy, to the second way of conceptualization as the locative or *in*-strategy, and the third one, as the possessive or *of*-strategy. The locative type can have subtypes that relate to containment (*in*) or surface (*on*), as will be illustrated in the ensuing discussion.

2.2 What are FPPs?

Suitable terminology and/or a definition for the "N1 in N2" partitives (e.g., of the type "one in three") are missing in sources that are otherwise rich in detail about various partitive structures in languages.[9] Until now we have not found a suitable definition or a term; therefore, we will create a new working term for these part–whole structures where "N1" is "one" (or more, typically, still referred to as "one") and N2 is more. The crucial point is that in a case such as "one in three", the actual quantity of "one" is typically more than one in real-life situations. If someone speaks of one in three applicants who would get the scholarship, then there are more applicants than three in the situation that is described. The actual quantity of "three" is understood as more than "three" in these constructions, but in a regular way. The quantity of applicants in the applicant pool can be understood as an approximation of six (as two times three, but not for instance "four", "five", "seven", or "eight"), nine (as three times three), and so on, including six hundred (as two hundred times three) or their approximations or perceived proportions. The quantity of applicants receiving the scholarship is two, three, or more: the two numerals are proportionally tightly related by multiplication. Another condition of such phrases is that they involve count nominal expressions, and also, that N1 is smaller in number than N2.

Typically, thus, "one" stands for more than "one" in these expressions, but the same condition applies to other numerals as well, such as "two" or "four". It represents a proportional fraction of a larger number of entities that represent a whole number and of which this cardinal number represents a selected fraction.

We have not found an adequate discussion of this type of linguistic expressions in previous literature on partitives in relation to the semantic properties that affect agreement patterns. However, several sources discuss structures

[9] Maria Koptjevskaja-Tamm: "A Piece of Cake" and "a Cup of Tea": Partitive and Pseudo-partitive Nominal Constructions in the Circum-Baltic Languages, in Ö. Dahl and M. Koptjevskaja-Tamm (eds.): *The Circum-Baltic Languages. Typology and Contact.* Vol. 2, Amsterdam, Philadelphia, John Benjamins, 2001, 523–568; Tania Ionin – Ora Matushansky: *Cardinals: The Syntax and Semantics of Cardinal-Containing Expressions,* MIT press, 2018; Michelangelo Falco – Roberto Zamparelli: Partitives and Partitivity, *Glossa: a Journal of General Linguistics* 4 (2019), 1–49, https://doi.org/10.5334/gjgl.642; Ilja Seržant, 59(4), 881–947; Ilja Seržant: Typology of partitives. *Linguistics* 59 (2021), 881–947.

that are related to the ones we refer to as FPP. We review here some accounts that elaborate on similar phenomena. In the literature on partitives, two related structures have been covered.[10] The first structure discussed under partitives includes that of percentages (type "C"). Type C contains proportional partitives and percentages, which "express the subset in terms of a proportion of its total". Here are some examples: *half of the doctors*, *all of the students*, *100% of the students*, *20% of those*, *80% of school children*, *much of theater is improvisation*, etc. The authors discuss examples such as: *Almost all / Half / 80% of the house was underwater* and *(With the flood,) half of most buildings was underwater*, giving the following representation to the latter: Most x: building(x). underwater(half of(x))

In our test sentences it should be noted that the sentences *only one in three are lucky to get it* and *only one in three is lucky to get it* do not display a semantic difference, and the proportion operator along the lines of Falco and Zamparelli[11] remains identical:

(2) applicant(x). lucky to get it (one_in_three ((x))

One special feature of FPPs is that the proportion operator has a semi-conventionalized linguistic form of two cardinals and a linker that is not necessarily based on the separative strategy ("out-of"). The other is that the cardinals represent fractions, a part and a whole.

The second similar or related structure in Falco and Zamparelli is that of "out of" partitives, the type "L", which "[i]ntuitively, […] express the proportion of the number of Ns who satisfy some predicate over the total number of Ns and are thus strictly related to the count cases [all of the students], but with a special syntax".[12] Two forms are provided in the source: {*two/four*}*out of four doctors*, and {*two/four*}*doctors out of four.*

The term "out-of" needs more nuance although the intuition behind it is useful. It is unsuitable because of the diversity in expression. It might be a suitable term for the separative strategy based in Hungarian, which uses *-ból*, a case ending that means "from, out of", but not in English, which uses the preposition *in,* or Italian, where the preposition *su(l)* is used, which translates as *on.* The literal translation of such expressions in Italian would be 'one ON three'.

The English "N1 in N2" type cannot be equated with either the "percentage" or the "out of" type of structures. Percentages represent proportional relations, but the wholes (supersets) are linguistically rarely expressed as they are invariantly understood as "one hundred" in this construction (*per+cent*). In the "N1

[10] Such as Michelangelo Falco – Roberto Zamparelli: Partitives and Partitivity, *Glossa: a Journal of General Linguistics* 4 (2019), 1–49, https://doi.org/10.5334/gjgl.642

[11] Falco–Zamparelli: *Partitives and Partitivity.*

[12] Ibid.

in N2" type, both numerals are expressed obligatorily and overtly. The nouns are optional and the reference presumably indefinite. There is a whole or total that is indefinite or mass-like but quantized,[13] and there is an indefinite but quantized part (as in "one applicant in three applicants"). Only the quantizers, the cardinal numerals, are overt and obligatory (as in "one in three"). If one aims at establishing an extended typology of FPPs, then reference to 'both numerals being expressed obligatorily and /overtly' allows us to exclude many partitive structures. This constraint is too strong for allowing the term FPP to be applied to Finnic and Romance partitive data, or Jibbali[14] data where, technically—syntactically—we have 'ZERO from ZERO', rather than 'N from N'. Semantically, and hypothetically, the numeral N1 that is syntactically zero or covert could be construed as "some", like "some of the people", while the numeral N2 can be construed as "an amount of" or "a number of". The data follows in (3).

(3) Jibbali[15] (Afroasiatic, Semitic; Oman)

mən	*ɛ́-yɔ́*	*dˁɔd*	*yəzir*	*īḳbért*
from	DEF-people	still	visit.IMPF.3M.PL	DEF.tomb

'some people still visit a (saint's) tomb'

The Jibbali data does not fall under the formulation of FPPs in the present paper. However, the Jibbali construction is a partitive, but with covert elements, or possibly a structure that is already grammaticalized as a pseudo-partitive. We disregard here the cases that have undergone grammaticalization and lexicalization, as we do not consider the unrecognizable *per+cent* to stand for the linker "per" and the superset, the whole, "one hundred". Discussing the Jibbali data also serves the purpose of pointing out, in the Arabic context, the variability of agreement patterns in the partitive phrases in subject positions (or, generally, in functions where agreement is attested in a language). The subject agreement with the partitive phrase is third person plural.

Are these expressions simply fractions? Anicotte[16] provides a discussion on fractions, which is helpful in understanding the multiple levels of linguistic structure involved in FPPs: "a fraction in a partitive expression can be an indivisible semantic unit or may, on the contrary, have a noun or a measure word inserted between its constituents". Indeed, the "one in three" may be

[13] For further research, it should be kept in mind that with respect to mass-like, it is important to keep separate morphological mass/collective forms in Arabic, e.g. *baqar* versus the plural *baqrat*, as the mass/collective form is in singular nd additionally does not allow for any numeral in front of it.

[14] A South Arabian endangered language spoken o.a. in Oman.

[15] Hofstede, Antje Ida: *Syntax of Jibbāli*. University of Manchester, 1998, 42. (Doctoral dissertation.)

[16] Rémi Anicotte: Description of the Linguistic Expressions of Fractions, *Language Sciences* 92 (2022), https://doi.org/10.1016/j.langsci.2022.101483

expanded to "one kilo of flour in three kilos of flour (gets moths each time it is shipped through the Bosphorus)". Anicotte[17] uses the terms 'numerator' and 'denominator', which can be applied for describing our data set of the type: "one in three", where "one", the N1, is the numerator and "three", the N2, is the denominator. The expression "one in three" is "humanese" for the representation of two cardinals and a symbol, such as 1/3. This brings us back to the issue of what the linguistic expression of the element represented by the slash, "/", is, as cardinal constructions follow the same linguistic semantic composition and syntactic structural principles.[18]

However, linguistic expressions of fractions are more abstract than FFPs. Among other languages, Anicotte[19] discusses the morphology of Arabic fractions such as 1/5. It is possible to express "six fifths" as a fraction in Arabic, but an FPP does not allow for the expression of "six from five" with "from", as it is a partitive not a fraction.

Thus, the "one in three" structures have a peculiar set of properties that set them apart from fractions, percentages, and "out-of" constructions. Consequently, we propose a novel working term to capture the fractional, yet proportional semantics expressed by these partitives as: *Fractional Proportional Partitives* (FPPs). FPPs are generic linguistic patterns capable of expressing any fractional proportional part (larger than zero) of a whole in cardinal numerals in a given language. This generic pattern for English is "N.card1 in N.card2", i.e., "numerator" in "denominator". FPPs are semantic operators that operate with the semantics of partitives of proportions that often have a form of a fraction. The two cardinals are linked by an overt linker and the structure can be extended by noun and measure phrases.

2.3 Agreement phenomena: grammatical versus semantic

The verb can be taken to usually agree with its subject's features, such as number, person or gender.[20] English, for example, has subject–verb agreement in number as part of its grammar. If the subject is singular, then the verb is singular as well, and vice versa, i.e., if the subject is plural, the verb agrees with

[17] Anicotte: *Description of the Linguistic Expressions of Fractions.*

[18] Following the work of Mark C. Baker: *The Syntax of Agreement and Concord*, Cambridge University Press, 2008.

[19] Anicotte proposes a typology. Any expression of a fractional numeral is either a suppletive form (called non-systematic) or an analytic form (called systematic). The analytic form can split into monodimensional (systematic, single argument) and bi-dimensional (systematic, double argument).

[20] Baker: *The Syntax of Agreement and Concord*.

it in the plural. We call this type of agreement "grammatical" to distinguish the singular agreement with "one" from the logical or real number agreement, which would reflect a number that is more than one, thus plural. We use the term 'semantic agreement' (as in "The police *are* present.").

In Afro-Asiatic, Semitic languages such as Standard Arabic, and Arabic variants of Gulf Arabic and Tunisian Arabic, there is a full subject verb agreement in SV word order; it involves agreement in all features: number, person and gender.[21] When the subject is plural or dual, then the verb remains in its standard – singular – form. This shows that the agreement is only partial. For example, if the subject is feminine/plural, the verb agrees with it. Besides, if the subject is masculine/singular or masculine/plural, it agrees with the verb accordingly.[22] What will be additionally discussed in our sample is a reference to the fact that the dual number value happens to be relevant for agreement (and concord) purposes in Standard Arabic; something which, as we will show, is not relevant for the non-Standard varieties. Additionally relevant to our discussion will be the fact that predicative adjectives enter in an agreement relation with the clauses' subject in a pattern that is similar to how attributive adjectives display concord with the noun they modify.

Burmese is the most unique language among the contrasted languages. In Burmese, the verb "be" is a morphologically unchanging copula where it doesn't matter whether the subject is singular or plural in terms of agreement (i.e., it is an uninflecting form). As the glossed examples from Burmese will demonstrate, agreement is not applicable in this Sino-Tibetic language. In contrast, the other language that will be compared with the Arabic variants is Hungarian, a Uralic language, which has agreement with the subject and the object that is marked on the verb by suffixes.[23] A verb can agree with other grammatical functions as well as its object, in our sample. Some scholars have recently addressed object agreement and partitivity in Hungarian and other Uralic languages,[24] and there is scope to integrate this further in our future studies on FPPs. We will be discussing agreement with indirect objects in our Maltese sample.

Although extensive studies have investigated the phenomenon of agreement, some questions remain unanswered. Notably, there is cross-linguistic variation when it comes to agreement in the three lexical categories: noun, verb, and adjective. If a partitive structure functions as the subject, then there may be

[21] Mohammad T. Alhawary – Elabbas Benmamoun (eds.): *Perspectives on Arabic Linguistics XVII-XVIII: Papers from the Seventeenth and Eighteenth Annual Symposia on Arabic Linguistics,* Amsterdam, Philadelphia, John Benjamins, 2005.

[22] Turki Alwahibee: *Simple Subject–Verb Agreement: A Morphosyntactic Path to Arabic Variations*, University of Wisconsin-Milwaukee, 2020. (Doctoral dissertation).

[23] Robert. M. Vago – István Kenesei – Anna Fenyvesi: *Hungarian*, London, Routledge, 1998.

[24] Other Uralic languages as in Nikolett Gulyás: *Object Marking in Komi-Permyak,* talk given at the online UIC series, 30 November 2022

several factors that can condition agreement on the verb (or the adjective, when the adjective takes on a predicative function). In languages with gender and agreement, the verb agrees with the subject's gender, and in a language with number and person agreement, the verb agrees with the subject's number and person, typically present in, for instance, European Slavic languages (4).

(4) Ukrainian

Вона	*спал-а.*	*Вони*	*спал-и.*
Vona	*spal-a.*	*Voni*	*spal-i.*
3F.SG	sleep-3F.SG	3PL	sleep-3PL

'She was sleeping. They were sleeping.'

Subject–verb agreement in a partitive structure is more interesting since N1 and N2 may have diverging features. Language-specific features such as headedness, word order, complexity of the structures, and cognitive processing may play a role in the type of agreement that results. If the part and the whole are represented by entities that have diverging gender or number features, then this issue may become relevant in terms of processing.

2.4 Languages of the sample

European, Asian, and African Arabic variants are targeted in this study and are represented by Maltese, Gulf and Tunisian Arabic, respectively. Standard Arabic is also targeted, particularly as a means for our comparison. Arabic is spoken by millions across the Middle East and North Africa. It is a significant language within the Semitic branch of the Afro-Asiatic language family. The geographical differences can have a significant impact on how it is spoken. Its variants are better regarded as separate languages although they share many linguistic features and lexical items, but we refer to Arabic spoken in various parts of the world as "Arabic variants". Hungarian, Khmer, and Burmese are targeted by elicitation. Several additional European and Asian languages are targeted in comparison in a second survey study. Figure 1 represents the languages of this study. English is included as an L2 for Arabic L1 speakers.

Figure 1 (Map 1): Languages of the sample (Source of the map: https://gisgeography.com/high-resolution-world-map/)

2.5 Research objectives

This study addresses two main research questions. The first question is as follows: Is there the same variation in the subject–verb number agreement in "one in three" in Standard Arabic, Arabic Gulf, Tunisian Arabic, and Maltese as in English? And the second question is about the types of FPP: What are the types of FPP partitive structures in the languages of Europe, in the Arabic speaking regions, and in the world, based on the data sample?

3. Methodology and data

Two data collection methods were used: two surveys and an elicitation task. The first survey aims to find out the differences in agreement on a smaller sample. The purpose of the second survey is to examine the FPP types and agreement patterns on a larger sample. The elicitation task was used to discover variation among distant and related languages and variants: Maltese, Gulf and Tunisian Arabic, Hungarian, Burmese and Khmer. The original surveys and elicitation were followed by follow-up survey distribution and elicitation in the final stages of the research (November 2023).

3.1 Pilot survey 1 on agreement

A forced choice task (Figure 2 and Figure 3) was distributed to Arabic and Arab speakers of English using a snowball sampling method. The two surveys were administered via Surveymonkey and were distributed between the 9th and 10th of September, and the 10th and 11th of September 2022, respectively. The snowball sampling method was primarily used for convenience. The method allowed us to reach subjects who were likely to use English and feel comfortable with online surveys. Therefore, we could obtain the answers in a relaxed way instead of a grammar test-like situation. The survey was distributed to the subjects via social media (WhatsApp) in Oman and Tunisia, as a continuation of an expression such as "one in three", by the author Iman Al Siyabi in Oman and by Najah Jellali in Tunisia. The sentential stimuli are detailed in Examples (5) and (6); they are presented as seen in Figures 2 and 3.

Figure 2: Arabic trigger sentence

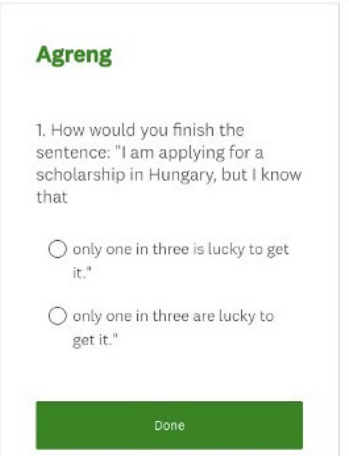

Figure 3: English trigger sentence

(5) English (Indo-European)
– How would you finish the sentence: I am applying for a scholarship in Hungary, but I know that
a. only one in three are lucky to get it
b. only one in three is lucky to get it.

(6) Standard Arabic (Semitic, Afro-Asiatic)

أرغب في التنافس للحصول على منحة دراسية في جمهورية المجر

a-rghab	*fi*	*al-tanafus*	*li-l-ħusool*	*ala*	*minħa_dirasya*
1SG-want.IPFV	in	DEF-competition	for-DEF-getting.SG.M	on	scholarship

fi *jumhuryat* *al-majar*
in Republic DEF-Hungary
'I would like to compete for a scholarship in Hungary.'

a.

شخص واحد فقط من بين ثلاثة أشخاص محظوظين للحصول عليها.

shakhs *waħid* *faqat* *min* *thalath-at* *ashkhas* *maħdhoudh-in*
person.SG.M one.SG.M only from three-PL.F person.PL.M lucky-PL.M

li-l-ħusool *alay-ha*
for-DEF-getting.SG.M on-3SG.F.GEN
'Only one in three are lucky to get it.'

b.

شخص واحد فقط من بين ثلاثة أشخاص محظوظ للحصول عليها

shakhs *waħid* *faqat* *min* *thalath-at* *ashkhas* *maħdhoudh*
person.SGM one.SG.M only from three-PL.F. person.PL.M lucky.SG.M

li-l-ħusool *alay-ha*
for-DEF-getting.SG.M on-3SG.F.GEN
'Only one in three is lucky to get it.'

3.2 Exploratory elicitation of genealogically diverse languages

The Hungarian, Tunisian Arabic and Burmese data were elicited on December 11, 2022, from students at the PhD school of intercultural linguistics, who are native speakers of Hungarian, Tunisian Arabic, and Burmese. The platform used for collecting the elicitation task was Teams. The students were asked to translate and gloss the following two statements in the context specified above in (5): (a) *only one in three are lucky to get it*, and (b) *only one in three is lucky to get it*. Some minor changes were added, mainly related to the abbreviations in some of the glossing that was provided by the students trained in linguistics. The students were occasionally asked to comment on the FPP strategy and the agreement pattern as well as on the causes for the emergence or lack of agreement.

Occasionally, if it turned out in elicitation that the language has plural agreement with subjects but, for various reasons, the agreement does not appear on the verb, other elements were sought for. For instance, the forms of the

Estonian verb "be" in 3pl and 3sg coincide (testing Estonian is discussed in Section 5).

The data on variants of Arabic provided by two of the authors of this paper (Al Siyabi and Camilleri) and elicited from PhD students by Al Siyabi are presented below. The Gulf Arabic examples were segmented and glossed by Al Siyabi. The Khmer data were elicited by Tamm (the third author), and they were transcribed in IPA, glossed, and segmented by Sizet Ven, student at the PhD school of intercultural linguistics. The Tunisian Arabic, Hungarian and Burmese data were segmented and glossed by students of the Intercultural Linguistics Doctoral School of the Eötvös Loránd University in Budapest,[25] and the segmentation and glossing were slightly adjusted by the authors for better comparability. The variants of Syrian and Moroccan Arabic were provided by Yosha Alabdullah and Zakariaa Nini, MA students of English at the Károli Gáspár University of the Reformed Church in Hungary (KRE). The Maltese examples were provided and glossed by Maris Camilleri, and they represent data from the Maltese Language Resource Server (MLRS) corpus.

3.3 An additional pilot survey for cross-linguistic variation

An additional survey was administered in June 2023 to collect data from speakers of various languages, involving students at the PhD school of intercultural linguistics, ERASMUS Mundus International Lexicography MA students at KRE and the faculty members of the language departments at KRE. The first version of Survey 2 proved to be too elaborate and seemed to require much linguistic knowledge; therefore, it was simplified so that it consists of two questions, both presented with checkboxes and an additional comment box. The first question targeted the partitive strategy (see the precise text and presentation in Figure 4) and the second probed for the agreement patterns (see Figure 5).

[25] Nour Ben Braham, Dorottya Szabó-Kovács, and Wai Yan Min Oo, pers. comm.

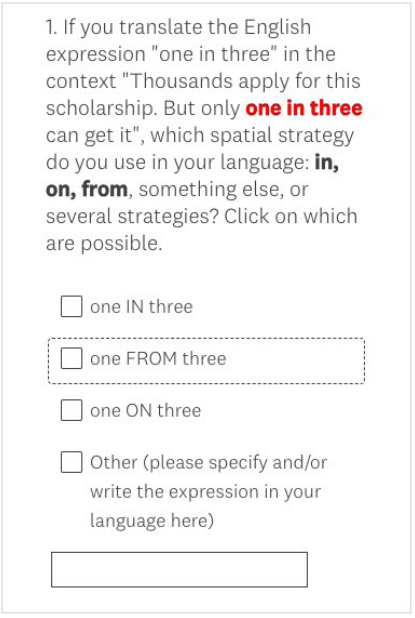

Figure 4: Survey 2 for determining the type of FPP construction

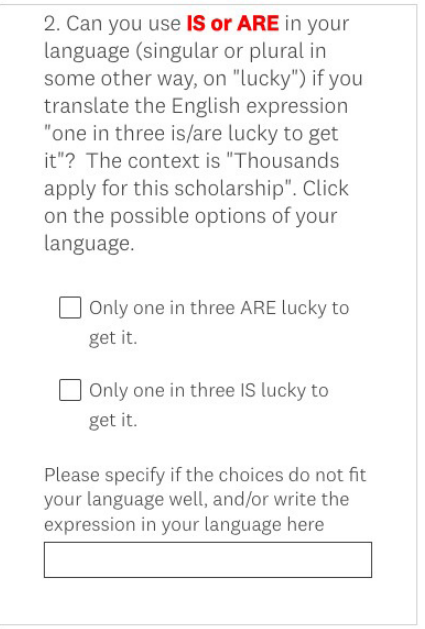

Figure 5: Survey 2 for determining the type of agreement in the FPP construction

4. Results

4.1 Results of the forced choice task

Figure 6 and Figure 7 present the results of the first survey. The forced choice task, which was sent to participants as a link in social media (WhatsApp) to gather data by means of the snowball sampling method in Oman and Tunisia had the following result: as a continuation of an expression such as "one in three", roughly one in four chose to continue the sentence with plural agreement on the verb, while three quarters of the respondents chose the continuation with singular agreement. The same sort of pattern was also replicated in the L2 English of native Arabic speakers. The exact number is represented in the figures below.

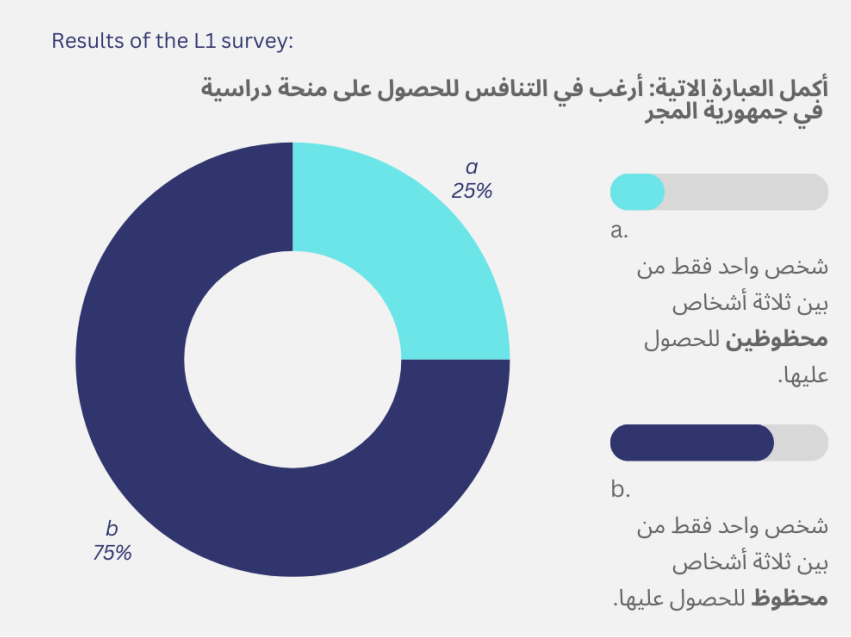

Figure 6: Results of the L1 survey

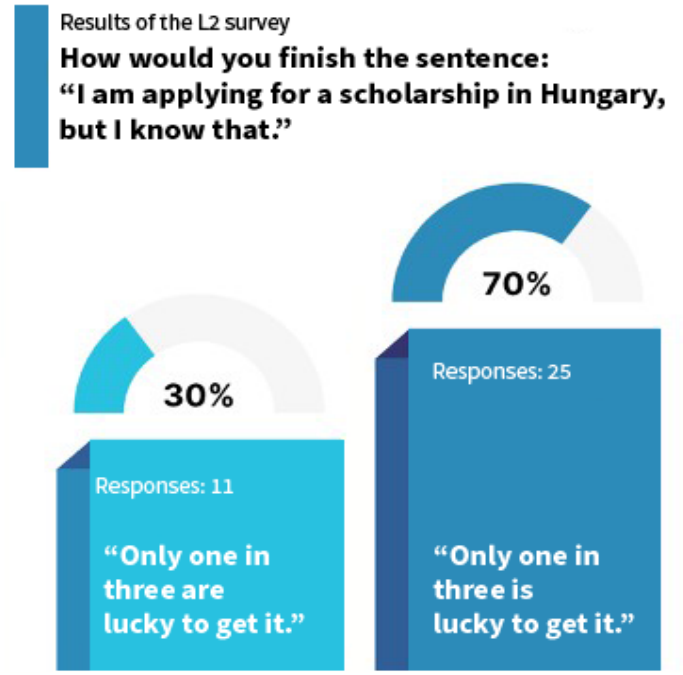

Figure 7: Results of the L2 survey

The results of the Arabic forced choice task showed that around 25% (9) of the participants (36 in total) chose plural agreement. The results of the English (Arabic L1) forced choice task showed that around 30% (11) of the participants (36 in total) chose plural agreement. See Appendix 2 for an illustration of the survey platform and its results.

4.2 Results of the elicitation task

The examples of this section comprise the results of the elicitation task in variants of Gulf (7) and (8), Tunisian (9), and Standard Arabic as well as Maltese (10). The discussion in Section 5 will focus on the strategies in encoding the FPPs and the agreement patterns in these languages.

(7) Colloquial Gulf Arabic: Khaliji (Oman, house and home environment)

a.

واحد بس من ثلاثة بيحصلوا البعثة

waħed	*bas*	*min*	*thalatha*	*ba-yħasl-u*	*el-batha*
one	only	from	three	FUT-3.get.IPFV-PL.M	DEF-scholarship

'Only one in three are lucky to get scholarship.'

b.

واحد بس من ثلاثة بيحصل البعثة

waħed	*bas*	*min*	*thalatha*	*ba-yħasl*	*el-batha*
one	only	from	three	FUT-3.get.IPFV.SG.M	DEF-scholarship

'Only one in three is lucky to get the scholarship.'

(8) Colloquial Gulf Arabic: Khaliji (Oman, formal environment)

a.

واحد فقط من ثلاثة اشخاص بيحصلوا البعثة

waħed	*faqat*	*min*	*thalath*	*ashkhas*	*ba-y-ħasl-u*	*el-batha*
one.SG.M	only	from	three	person.PL.M	FUT-3.get.IPFV-PL.M	DEF-scholarship

'Only one in three people are lucky to get the scholarship.'

b.

واحد فقط من ثلاثة اشخاص بيحصل البعثة

waħed	*faqat*	*min*	*thalath*	*ashkhas*	*ba-y-ħasl*	*el-batha*
one.SG.M	only	from	three	person.PL.M	FUT-3.get.IPFV-SG.M	DEF-scholarship

'Only one in three is lucky to get the scholarship'

(9) Tunisian Arabic (Afro-Asiatic, Semitic) (elicitation with transcription)

a. *ken weħed men tletha and-hom el-zhar bish ye-khdh-u=h*
only one.SG.M from three have-3.PL.GEN DEF-luck in_order_to 3-get.IPFV-PL=3.SG.M.ACC
'Only one in three are lucky to get it.'

b. *ken weħed fi/men tletha and-u el-zhar bish*
only one.SG.M in from three have-3.SG.M.GEN DEF-luck in_order_to
ye-khedh-ou=h
3-get.IPFV-PL=3.SG.M.ACC
'Only one in three is lucky to get it.'

(10) Maltese (Afro-Asiatic, Semitic)

a. *Wieħed minn kull hamsa ji-ġri-l-hom hekk*
one.SG.M from all five 3.happen.IPFV.SG.M-DAT-3.PL like.that
'This happens to one in five.'

b. *Wieħed minn kull hames persun-i j-kun-u fil-mira*
one.SG.M from all five person-PL 3.be.IPFV-PL in.DEF-aim
ta' attakk-i min-nemus
of attack-PL from.DEF-mosquito.PL
'One in five people are attacked by mosquitoes.'

c. *...raġel minn kull tlieta lest i-qatta'*
...man from all three ready.SG.M 3.spend.IPFV.SG.M
'a man from every three is ready to spend ...'

d. *Mara minn kull erbgħa għadd-iet minn forma jew*
woman.SG from all four pass.PFV-3.SG.F from form or
oħra ta' vjolenza domestik-a
another.SG.F of violence.SG.F domestic-SG.F
'One in four women suffers from one form or another of domestic violence.'

The results of eliciting the data collection from languages other than English and Arabic are presented for Hungarian (11), Burmese (12), and Khmer (13). The discussion in Section 5 will focus on the strategies in encoding the FPPs and the agreement patterns in these languages.

(11) Hungarian (Uralic, Ugric)

a. *három-ból csak egy olyan szerencsés, hogy meg-kap-ja.*
three-ELA just one so lucky.SG that PV-get-OBJ.3SG
'Only one in [out of] three is lucky to get it.'

b. **három-ból* *csak* *egy* *olyan* *szerencsés-ek, hogy* *meg-kap-ják.*
three-ELA just one so lucky-PL that PV-get-OBJ.3PL
Intended to express: 'Only one in [out of] three are lucky to get it.'

(12) Burmese (Sino-Tibetan, Burmese-Lolo)

a. *Thone* *yout* *mhar* *ta* *yout* *bae* *aedar*
three.ADJ men.CLF in one.ADJ man.CLF only it.OBJ
go *ya* *(bolt* *kankaung tal)*
to.TOP get.V be.COP lucky.ADJ SUF
'Only one in three are lucky to get it.'

b. *Thone* *yout* *mhar* *ta* *yout* *bae* *aedar*
three.ADJ men.CLF in one.ADJ man.CLF only it.OBJ
go *ya* *(bolt* *kankaung* *tal)*
to.TOP get.V be.COP lucky.ADJ SUF
'Only one in three is lucky to get it.'

(13) Khmer (Austroasian)

a.

Khmer	មួយ	ក្នុង	បី	មានសំណាង	ទទួល	វា
IPA	muɜj	knɔŋ	bɛi	miɜn sɑmna:ŋ	tɔ:tuɜl	viɜ
Latin	muoy	knong	bei	mean samnaang	tortuol	vea
English	one	in	three	is lucky	to.get	it

b.

Khmer	មួយ	ក្នុងចំណោម	បី	មានសំណាង	ទទួល	វា
IPA	muɜj	knɔŋ cɑmnɑɔm	bɛi	miɜn sɑmna:ŋ	tɔ:tuɜl	viɜ
Latin	muoy	knong camnorm	bei	mean samnaang	tortuol	vea
English	one	among	three	is lucky	to.get	it

c.

Khmer	មួយ	លើ	បី	មានសំណាង	ទទួល	វា
IPA	muɜj	lɜ:	bɛi	miɜn sɑmna:ŋ	tɔ:tuɜl	viɜ
Latin	muoy	leu	bei	mean samnaang	tortuol	vea
English	one	on	three	is lucky	to.get	it

d.

Khmer	មួយ	នៃ	បី	មានសំណាង	ទទួល	វា
IPA	muɜj	nɜi	bɛi	miɜn sɑmna:ŋ	tɔ:tuɜl	viɜ
Latin	muoy	niy	bei	mean samnaang	tortuol	vea
English	one	of	three	is lucky	to.get	it

4.3 Results of the additional survey for cross-linguistic variation

The representative summary of the FPP strategies and agreement patterns as manifested in various other languages within our language sample is presented in Table 1.

Table 1: Results of the additional survey for cross-linguistic variation in FPP realizations

	Strategy			Agreement			
Languages	Locative		Separative	Grammatical agreement IS	Semantic agreement ARE	Both	Neutral
	IN	ON	FROM				
	English	Dutch	Farsi (Persian)	Turkish	none	Farsi / Persian	Burmese
	Khmer	Italian	Estonian	French		Dutch	
	Burmese	French	Irish	Indonesian		Arabic	
		Estonian Khmer Norwegian	Turkish Norwegian	Khmer Kachin French			

The additional survey resulted in additional information on the following languages:

The locative strategy was found in the following languages:

– English, Burmese, Khmer (IN languages),

– Dutch, Norwegian, Italian, French, Estonian, Khmer (ON languages).

The separative strategy was found in the following languages:

– Farsi (Persian), Estonian, Irish, Turkish, Norwegian (FROM languages).

Dutch, French, and Italian have the "on" locative strategy and in Dutch, both "is" and "are" are used (although there is a normative pressure to use "is"). Farsi and Irish have also "from". Estonian has "from", but "onto" is also possible. Khmer has locative strategies based on "in", "on", and "among". Additionally, it has "of", the possessive strategy for the FPP that we did not attest elsewhere. The question on the agreement patterns, however, did not match what we had learned previously, so the question could have been too complicated or there is variation. The results demonstrate that besides Arabic, French, Indonesian, Kachin, Turkish also have grammatical agreement. Semantic agreement as the only possibility does not emerge in any of these languages. We also found that both agreement patterns appear in Farsi/Persian. For several languages, in sum, it is difficult to interpret the agreement data.[26]

[26] As a pointer to promising further study, more research on Arabic fractions/percentages/quantities could provide us with robuster evidence that FPPs are genuinely distinct structures. Percentages in Arabic actually use the LOC strategy, while a number of structures such as

5. Analysis and discussion

We identified a type of partitive that has not been well defined in previous literature[27] and proposed a working term, *fractional proportional partitives*, FPP, to refer to this type. Examples of these partitives comprise two cardinal numerals and a grammatical element such as a case or a preposition (or an adposition) to link them, like in "one in three" or "two in three". Their structure consists of "N1 linker N2", where N1, either a numeral or a noun that stands for the numeral (e.g., "man", "woman" in Maltese) is a proportional fraction of N2, which represents the whole (superset).[28] For agreement, they are semantically peculiar, as the head, i.e., the N1, may be grammatically singular, while, typically, it is semantically plural. If one in three wins the scholarship, it is typically more than one person. We can see that these expressions are semantically plural from the following Example (14), where "one" cannot be interpreted in a follow-up sentence with singular (14a); plural is, however, compatible (14b). The hash mark "#" indicates semantic incongruity.

(14) [*I want to apply for a scholarship in Hungary, but I know that only one in three gets it.*]

a. *#He sure will throw a party when he gets it.*

b. *They sure will throw a party when they get it.*

The peculiarity of grammatically- versus semantically-motivated number in FPP agreement patterns in Arabic and Arab speakers of English could be verified with the first pilot study. Our first pilot study, a forced choice task conducted via a snowball sampling by distributing a link to participants on social media (WhatsApp) in Oman and Tunisia, showed a predominantly separative strategy and a variable agreement pattern: grammatical and semantic. For the linking element, previous literature on partitives had established separative, locative, and possessive strategies, based on different metaphors, of which separative

majority, amount, etc, make use of the POSS strategy. In a more extended study, these can be considered separately, and then compare/contrast with other languages such as Hungarian/Estonian and Irish alone, since BOTH are genealogically distinct but typologically share the FROM FPP strategy.

[27] Hereby we mean the standard sources such as Cardinaletti and Giusti 2018, Carlier and Lamiroy 2014, Glaser 1992, Ihsane and Stark 2020, Luraghi et al. 2020, Luraghi and Huumo 2014, Sleeman and Giusti 2021, Sleeman and Luraghi 2023, Selkirk 1977, Strobel 2017.

[28] Note that in 'two cardinal numerals', the Maltese data provided is not strictly necessarily a cardinal numeral in N1. Of course: man/woman entails a representation of `one', but just to ensure that our description of the phenomenon in question is encompassing of the overall data this should be noted here. These structures resemble the pure or proper partitives (in terms of Koptjevskaja-Tamm 2001 and other literature) in that both sets are quantified, but they also resemble pseudo-partitives as the referents in both sets are indefinite, yet numerically defined in relation to each other.

("from") and locative ("in") emerged in the first survey. However, we found only the separative and locative strategies ("in" and "on") in the first, pilot survey.

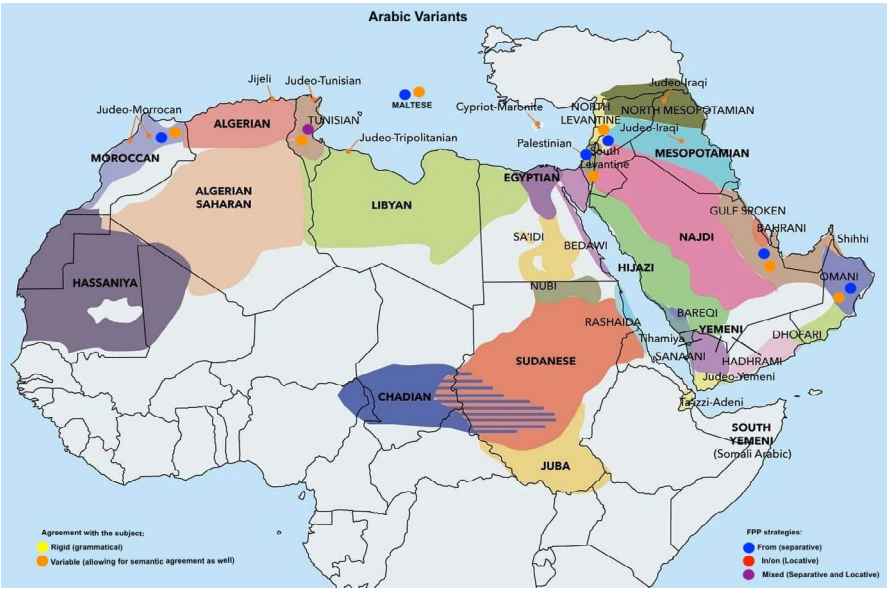

Figure 8 (Map 2): Arabic languages of the sample
Source of the map: https://industryarabic.com/arabic-dialects/

Next followed the elicitation task that was carried out with a larger number of languages, expanding the data set with Maltese, Hungarian and Burmese. No additional typological diversity was found for the strategies. These remained locative and separative in the elicitation study. However, fuzzy intuitions and interpretations could be resolved in elicitation for Tunisian Arabic. It shows the same partitive structures in subject agreement as in other Arabic variants in our study, using *men* as the linking element. The adposition *men* or *min* refers to the source metaphor and a separative strategy, meaning "to be out of or from somewhere".[29] The Tunisian participant in elicitation stated that she first made use of *fi* 'in' as she thought of the data as a sort of mathematical fraction. The *fi* 'in' option reveals the metaphor of the container and the strategy of location (parts are in the whole, subset is within the superset).[30]

The elicitation study revealed relevant typological diversity in agreement to be considered in the method due to two factors. The first factor to consider in

[29] Following the work of Luraghi–Huumo (eds.): *Partitive cases and related categories*.

[30] Both the plural and singular forms were attested as subject verb agreement in *andhom* 'have' and *andou* 'has'. The participant later agreed to change it to *men* 'from'. Thus, variation was retained in the sample, *fi/men,* in Example (9.b), because both variants are possible in interpretation.

similar studies is that in Burmese and Khmer, no agreement could be established for language-internal reasons. The second factor is that in Hungarian, other language-internal reasons prevented semantic agreement. Burmese examples illustrate a divergence from examples (7) and (8) in Gulf Arabic, (9) in Tunisian Arabic, (10) in Maltese and (11) in Hungarian. The Burmese and Khmer singular and plural clauses, as in (12a) and (12b) and in (13), show lack of agreement. The conclusion is that establishing a typology of agreement may fail with the given methods, elicitation and survey based on translation, if it is not known if a language has subject–verb agreement at all or if the numeral phrase structure interacts with agreement in a particular way. The language may mistakenly be classified as a rigid FPP agreement language.

There are certainly more languages that should be excluded from the sample purely on the grounds of structural incompatibility with the research question. We can assume that for any further study of agreement, a preselection of languages based on their agreement patterns should exclude languages that lack subject agreement altogether.

The second point learned from the elicitation study concerns the choice of the word class or a particular lexical item for testing, as in many languages, the copula "be" does not emerge in predicative contexts (e.g., Hungarian, 3rd person singular and plural), or its form may be identical in singular and plural (e.g., Estonian). Here, the situation can be remedied when subject agreement markers may appear on predicative adjectives in some languages instead (Hungarian, Arabic). Moreover, the methods in the present paper mainly address only subject agreement with what stands for the predicate. It is an unexplored area yet to study how partitive phrases agree in those languages that have other types of agreement, such as object agreement in addition to subject agreement with the verb. Hungarian and many Uralic languages have object agreement, but the numeral-related expressions may differ in the object function (e.g., consider that the subject–verb asymmetries in "the two of them" may vary in "the two of them sang" and "I saw the two of them"). The elicitation showed that in Maltese, semantic agreement is attested with the FPP dative indirect object (10a), although grammatical agreement is not excluded in such a context.

Many languages have asymmetries that concern (typically postverbal) partitive subjects that do not trigger subject agreement (e.g., Finnic). In Arabic, word order is an attested factor that influences the agreement pattern on verbs, which would be an interesting avenue to explore with FPPs. In languages such as Arabic, with gender marking playing a role in partitives and their agreement patterns in addition to number, it is an additional avenue to explore. Moreover, Standard Arabic also has a dual number value that is relevant for agreement purposes, as shown in Example (15), which adds a pairwise interpretation and a new puzzle to the study of FPPs in languages with duals (e.g., many Uralic languages and Slovenian).

(15) Standard Arabic

a.

فقط اثنان من ثلاثة محظوظين سيحصلان على البعثة.

faqat	*ithn-an*	*min*	*thalatha*	*mahdhudh-een*	*sa-y-hsul-an*
only	two-DU.M	from	three.SG.F	lucky-DU.M	FUT-3-get.IPFV-DU.M
ala	*al-betha*				
upon	DEF-scholarship				

'Only two from three will be(come) (DU.M) lucky to get the scholarship.'

b.

فقط اثنتان من ثلاث محظوظات سيحصلن على البعثة.

faqat	*ithnat-an*	*min*	*thalath*	*mahdhudh-aat*	*sa-y-hsul-n*
only	two-F-DU	from	three.SG.F	lucky-PL.F	FUT-3get.IPFV-PL.F
ala	*al-betha*				
upon	DEF-scholarship				

'Only two from three will be(come) (PL.F) lucky to get the scholarship.'

The elicitation and the second pilot survey showed that some languages have multiple strategies for encoding FPPs, and the division of labor between them and their effects on agreement are little understood. Variation in agreement in the Arabic variants between "one in N *is* or *are*" emerges regardless of the separative or optionally locative partitive marking strategy.

Hungarian does not allow plural agreement with the FPP phrase. Hungarian shows similarities to the different Arabic varieties in its use of strategy, namely, *három-ból* 'from three', which is elative. However, there is a difference in agreement when compared to the different Arabic varieties. In Hungarian translation and glossing of the verbs "is" and "are", no difference arose, in contrast to how it did in both Arabic Gulf and Tunisian Arabic examples in (7), (8) and (9). The agreement with the FPP subject is invariantly singular in Hungarian (except when using adverbial constructions such as, e.g., "*kett-en*" [two-adv] 'two' as in 'two in three'), even though the language is known to have singular and plural agreement with subjects. Note that here we do not consider adverbial constructions such as, e.g., "*kett-en*" [two-adv] 'in a pair, in two, both' as the condition of proportionality and fraction are not met, and it does not mean in 'two in three'. However, number phrases lack plural agreement, which could explain the rigid agreement pattern; see Hungarian in (16a, b) and Estonian in (16c, d).

(16) a. Hungarian, singular agreement only, verbal predicate

[…]

Kettő	*a*	*három-ból / Három-ból*	*kettő*	*jó*	*jegyet*
two[NOM]	DEF	three-ELA	three-ELA	two[NOM]	good	grade.ACC
kapott	*/*kaptak*.				
get.PST.3SG / get.PST.3PL					

'[Twelve students took the exam.] Two in three got a good grade.'

b. Hungarian, singular agreement only, other predicates

[…]

Kettő *a* *három-ból / Három-ból* *kettő* *tanár /* *beteg*

two[NOM] DEF three-ELA three-ELA two[NOM] teacher.NOM.SG sick.NOM.SG

**tanár-ok /* **beteg-ek.*

teacher-NOM.PL sick.NOM.PL

'[Twelve people were absent.] Two in three were teachers/sick.'

c. Estonian, plural agreement

[...] *Kaks* *kolme-st* *sa-i-d* *hea* *hinde.*

two[NOM] three-ELA get-PST-3PL good.ACC grade.ACC

'[Twelve/many students took the exam.] Two in three got a good grade.'

d. Estonian, singular agreement

[...] *Kaks* *kolme-st* *sa-i* *hea* *hinde.*

two[NOM] three-ELA get-PST.3SG good.ACC grade.ACC

'[Twelve/many students took the exam.] Two in three got a good grade.'

Hungarian allows only singular agreement, but Estonian varies. Note that there is only one agreement pattern available in Hungarian for this particular structure: SG, as presented here on the verbal predicate *kap* 'get'. The agreement structure is not only available for verbal but also nominal predicates, for instance, *tanár* 'teacher' or *beteg* 'sick' (16b). That is, the structure is available for the predicate of the structure, whatever that may be. As an interesting comparative note, we see plural agreement available in Estonian, example (16c), in contrast to its language relative, Hungarian. Plural agreement is the preferred, not the only agreement available for Estonian (see an example with singular agreement in 16d), that is, it is not strictly non-alternate as in Hungarian.

This is an example where a preselection of languages based on their agreement details is warranted before launching a large-scale study of verb or adjective agreement with partitive structures. Szőke[31] explains the morphosyntactic features of numeral phrases in Hungarian as follows: "Quantified noun phrases (such as *két lány* 'two girls') are morphologically singular in Hungarian, hence they lack a number feature, triggering singular agreement on the verb".

The Estonian example (16c) is like Hungarian, with singular agreement in the context of a numeral. However, example (16b) is like the English numeral phrase, where the agreement is with the overt number.

[31] Bernadett Szőke: Appositive constructions, in G. Alberti – T. Laczkó (eds.): *Syntax of Hungarian Nouns and Noun Phrases Volume 2,* Amsterdam University Press, 2018, 896–931.

Note that gender is absent in both languages and there is a relevant difference in the Uralic examples when compared to the English counterpart: number. Neither Hungarian nor Estonian nouns in numeral phrases carry plural markers (17). Nevertheless, Hungarian and Estonian do differ: in case. The Hungarian noun in 'two girls' (17a) bears no case marker; the form is in the nominative. The Estonian noun in 'two girls' bears the partitive case marker instead; the form is partitive singular with plural (17b) as well as singular (17c) agreement.

(17) a. Hungarian, singular agreement only

[…]	*Két*	*lány*	*jó*	*jegyet*	*kapott/*kaptak.*
	two.NOM	girl.NOM	good	grade.ACC	get.PST.3SG /3PL

'Two girls got a good grade.'

b. Hungarian, singular agreement only, other predicates

[…]	*Két*	*lány*	*tanár /*	*beteg*
	two.NOM	girl.NOM	teacher.NOM.SG	sick.NOM.SG
	**tanár-ok /*		**beteg-ek.*	
	teacher-NOM.PL		sick.NOM.PL	

'[Twelve people are present.] Two girls are teachers/sick.'

c. Estonian, plural agreement

[...]	*Kaks*	*tüdruku-t*	*sa-i-d*	*hea*	*hinde.*
	two.NOM	girl-PART	get-PST-3PL	good.ACC	grade.ACC

'Two girls got a good grade.'

d. Estonian, singular agreement

[...]	*Kaks*	*tüdruku-t*	*sa-i*	*hea*	*hinde.*
	two.NOM	girl-PART	get-PST.3SG	good.ACC	grade.ACC

'Two girls got a good grade.'

Identical patterns persist in adjectival agreement patterns for Hungarian, which allows only singular. In Estonian, predicative adjectival agreement can be studied in two environments, with an overt copula or within secondary predication. In the copular construction, there is obligatory number agreement and in secondary predication, the adjectives prefer singular number, merely allowing for plural. An asterisk marks ungrammatical options and a question mark dispreferred but grammatical options.

(18) a. Hungarian, singular, agreement with adjective

Két	*lány*	*jó.*
two.NOM.SG	girl.NOM.SG	good.NOM.SG

'Two girls are good.'

b. Hungarian, no plural agreement with adjective

**Két*	*lány*	*jó-k.*
two.nom.sg	girl.nom.sg	good-nom.pl

Intended 'Two girls are good'.

c.

Kaks	*tüdruku-t*	*on*	**hea/*	*hea-d.*
two.nom.sg	girl-part.sg	be	good.nom.sg	good-pl

'Two girls are suitable'.

d.

Kaks	*tüdruku-t*	*osutu-si-d*	*hea-ks/*	*?hea-de-ks*
two.nom.sg	girl-part.sg	turn.out-pst-3pl	good-tra.sg	good-pl-tra

'Two girls turned out to be suitable'.

These examples show that variation in number should also be checked against other factors in a generic translation questionnaire. These factors include numerals other than "one", and clarifying how quantifier and numeral phrases are built up in the language. These factors may determine agreement patterns with numeral phrases. Non-verbal and verbal predication may also cause unexpected results in a large-scale typological translation questionnaire-based survey. Even within a language with predicative adjectives, patterns may diverge.

Before discussing further, it is useful to remind that "number" is discussed here in a multitude of ways; therefore, we distinguish the term "number" and "numeral". The term "numeral" applies to words (or symbols) that stand for numeral quantity. The term "number" pertains to the grammatical category (singular, plural, dual) and the features of nouns, pronouns, adjectives and verb agreement that expresses count distinctions.

As we can see after an examination of South-East Asian languages and Hungarian, there are language-specific structural factors that determine the ban on semantic agreement. In Hungarian *numeral* and quantifier phrase subjects, agreement must always be singular regardless of the *numeral* or quantifier (one, *two, three*, some, many etc.). Note that this feature does not extend to the *category of number* (singular versus *plural*) as nouns in *plural number* trigger *plural agreement*. The lack of detailed knowledge of quantifier, numeral, and determiner phrase structures forms a limitation for a method of this kind.

The language-internal reasons for the variation need thus further study, and it is required for the case of English as well, which displays variation and makes use of a locative marking strategy ("in"). It seems that languages with prepositions are more prone to varying versus rigid agreement patterns. English, Arabic, and Dutch have prepositions, and their agreement varies, but Hungarian and Estonian, which employ case marking as the element that links the numerals in the construction, do not. The difference in the structures that the predicate agrees with, that is, the NP/QP/DP is likely to be different in these

cases, but this requires further study. We could exclude semantic agreement in Hungarian because of the structure of agreement with numeral phrases in example (16a), but Estonian in (16b) would then remain unexplained. It is possible that in languages with prepositions, N2, the second numeral that stands for the superset or the whole, interferes more readily with processing as a potential head to agree with, as it precedes linearly more tightly the element that the partitive construction agrees with, and it is formally more ambiguous (being nominative) than a form that has a case suffix. It is also possible that the salience of N2 in the discourse plays a role, or that the grammars of different languages handle the salience of the referent groups in a diverging way. The situation is comparable to the agreement patterns of collective nouns such as *the committee* in language varieties such as English as it is used in the UK versus US. In the UK as opposed to the US, both agreement patterns are in use.

Some of the FPP strategies and agreement research could be understood better if placed within the context of other partitive or measure structures in agreement environments cross-linguistically, and here we can offer mere insights into gaps in research. Regarding this matter, it is also likely that we did not see a correlation between the partitive strategy and agreement type, because of the lack of sufficient data to generalize.

From the second pilot survey, an additional interesting point appeared: possible interaction with definiteness markers, as in Italian, Hungarian, or Dutch: *een op (de) drie* (Dutch), literally: 'one (on) the three'. Variation within these expressions emerged from the study as well (*de* 'the'). The variation between the variants with and without definite articles requires further study of spoken or at least spontaneous language.[32] We can only hypothesize that overt definite markers and spontaneous agreement patterns might correlate; this is left for further study.

Comparing Hungarian to Dutch, which allows definiteness marking with N2, we see that Hungarian, the only uncontested Uralic language with definite and indefinite articles, does so, too: *egy a háromból* (one def.art three-ela), 'one in [the previously mentioned set of] three'. In Dutch, the definite article is redundant in the structure, as there are no specific three referents in the discourse. The structure is an FPP. In Hungarian, the structure with the definite article is not an FPP, because its superset contains three referents only: they are discourse-linked.

However, this word order and construction is ungrammatical or dispreferred for most native informants (Réka Hajner, Kata Kubínyi, Katalin Hegyi, pers. comm.). Additional information revealed that semantic agreement seems to become available with numerical state adverbials (e.g., *ketten* 'in two').

[32] Agreement here should become singular only, i.e., grammatical, something to consider for further work on Arabic fraction types.

Examples with an overt nominative numeral subject (19a, b) are subject to variation in grammaticality judgements. However, for those who find it grammatical, there is semantic agreement. Examples (19c, d) with numerical state adverbials such as *ketten* 'in two' show plural agreement, but whether this displays semantic agreement is dubious as there is a subject drop. No definite article appears in (19a–e). Examples (19a, b) are considered either ungrammatical or substandard by various linguistically educated speakers (Kata Kubínyi, Katalin Hegyi, pers. comm.).[33]

Example (19e) shows that a numeral *egy* 'one' or *kettő* 'two' in an FPP shows singular agreement.

(19) Hungarian

a. ??*Három-ból* *egy-en* *jött-ek* *el.*
three-ELA one-ADV come.PST-3PL PV
'One in three came.'

b. ??*Három-ból* *egy-en* *boldog-ok.*
three-ELA one-ADV happy-3PL
'One in three are happy.'

c. *Három-ból* *kett-en* *jött-ek* *el.*
three-ELA two-ADV come.PST-3PL PV
'Two in three came.'

d. *Három-ból* *kett-en* *boldog-ok.*
three-ELA two-ADV happy-3PL
'Two in three are happy.'

e. *Három-ból* *egy/kettő* *boldog /* *eljött.*
three-ELA one-ADV/two happy.3SG PV.come.PST.3SG
'One/two in three is happy/came.'

The type of FPP grammaticalization strategy employed, i.e., whether separative or locative, is not found to correlate with the optional variability of singular versus plural agreement. This suggests that there are other differences in the structures of the languages that may cause the variation. The alternation in (19) is partly explained by the adverbial nature of the numeral, where the semantic agreement type must apply, without an overt nominative numeral "one" that

[33] See Tóth et al. on Uralic for more information on Hungarian partitives with *-ik*; it is clear that the partitive suffix *-ik* cannot be used in FPPs in Hungarian as in numerals with *-ik*, the cardinality s exactly as the numeral denotes: az *egy**ik** a háromból* one-IK DEF.ART three-ELA 'one in three'. See also É. Kiss (2018) for the suffix *-ik*.

would trigger the grammatical, singular agreement. The Hungarian adverbial strategy based on an essive case ending on the N1 suggests an additional adverbial numeric state or essive strategy type that could be called "AS" (similative).

The following figures illustrate the agreement (Figure 9) and the type of FPP partitive strategy (Figure 10). The FPP and subject agreement values are shown in Figure 9 and the FPP strategies are presented in Figure 10: as in those languages: Arabic Gulf, Tunisian Arabic, Burmese, Khmer, Hungarian, Farsi (/Persian), Irish, Turkish, Maltese, Estonian, Dutch, Italian, French, and English.

Figure 9 (Map 3): Agreement with the subject: rigid (grammatical) or variable (allowing for semantic agreement as well). Key: Variable: blue. Rigid: red. Not applicable: yellow

Figure 10 (Map 4): FPP strategies. In/on (Locative): red. From (separative): blue. Mixed type (Separative and Locative): purple

Various semantic constraints can be hypothesized to hold, such as:
a. the numeral in Q2 multiplies the numeral in NP1 to obtain the number of referents in NP2.
b. the DP2 can be definite or not (on conditions yet to be determined).

Partitives in spoken and written languages may affect the agreement forms of the sentence, as written language in the corpora may be more normative and less dependent on variation that occurs under cognitive load. For future studies, it seems that an experimental processing method is likely to provide insights.

6. Limitations

A word on limitations is also in order. This study is exploratory, presenting the limits of the variation on a sample that is based on four Arabic variants, complemented with languages that belong to genealogically different Asian and European languages. The generalizations in the present paper are limited to the data based on our two pilot surveys, translation questionnaire-based elicitation, personal language proficiency, and corpus work of the authors, thus there is a lack of sufficient data and insights to generalize more.

For instance, the translation method in sampling leaves aside examples such as Hungarian (or any other) fractions, which have a possessive structure of a fraction (20a) or an ordinal numeral construction (20b), which were missing from the translation questionnaire-based data but provided by the editors of this volume, Kata Kubínyi and Katalin Hegyi, pers. comm.

(20) a. *Csak* *egy* *harmad-a/-uk* *szerencsés.*
just INDEF third-3SG/PL.POSS lucky.SG
'Only a third is lucky.'

b. *Minden* *harmadik* *szerencsés.*
every third lucky.SG
'Every third one is lucky.'

Additionally, semantic, plural agreement in adverbial structures was not elicited through the questionnaire, but provided in a comment of an online presentation, as in (21).

(21) *Ketten/* ??*Egyen* *három-ból* *szerencsés-ek.*
two-ADV one.ADV three-ELA lucky-3PL
'Two/One in three are lucky.'

Various readers have pointed out that there is word order variation and that some word orders ameliorate the structure (22a) or render it unacceptable

(22b). Example (22d) is a grammatically acceptable word order variant of (22c). Example (22b), lacking a definite article, is ungrammatical, and is not deemed as a grammatically acceptable word order variant of (22a). Note that examples (22c, d) are not FPPs, as opposed to Dutch, where the definite article is in free variation, in *een op de drie* lit. 'one in the three'. These are questions that are left for further study.

(22) a. *Három-ból egy szerencsés.*
three-ELA one lucky.SG
'One in three is lucky.'

b. **Egy három-ból szerencsés.*
one three-ELA lucky.SG
'One in three is lucky.'

c. *Egy a három-ból szerencsés.*
one DEF three-ELA lucky.SG
'One in three is lucky.'

d. *A három-ból egy szerencsés.*
DEF three-ELA one lucky.SG
'One in three is lucky.'

A reviewer points out that another interesting topic is the verb—preverb order that may vary. In *háromból egy jött el* 'one in three came', with a preverb that follows the finite verb as the FPP is in the focus position. However, the FPP can also be a topic, and the preverb appears attached to the finite verb, as in *háromból egy eljött* 'one in three came'. We can observe that topichood versus focushood does not influence the agreement pattern either, as it is invariantly grammatical not semantic.

Some of the FPP agreement research could be placed within the context of other partitive structures. For instance, variation in definiteness emerged from Hungarian and from the ON-strategies, as in the Dutch *een op (de) drie* [one on DEF three] 'one in three'. No clear correlations between the agreement patterns and the presence of the definite article could be observed with our methods. In Hungarian word order contributes to the availability of the fractional proportional partitive reading.

The FPP type and variable agreement does not correlate with language families, thus suggesting that general cognitive mechanisms (e.g., limits on processing, salience, memory) might be involved in structures where language-internal factors are excluded. These mechanisms could not be addressed in our study.

7. Summary

Based on a pilot study of the partitive N1 linker N2 type expressions such as "one in three", for which we use the working term *fractional proportional partitives*, or FPPs, we have shed light upon an understudied partitive structure that is frequent and widely spread in languages and that causes variation in agreement in a wide variety of languages as well as within closely related variants.

In the present paper, we have established that languages vary in how they encode FPPs, and how FPPs trigger subject agreement. The focus is on the Arabic languages and variants Maltese, Gulf Arabic, Tunisian Arabic, and Standard Arabic. L2 English (L1 Arabic), Hungarian, Khmer, and Burmese agreement with FPP structures have also been studied to illustrate the limits of studying the variation in grammaticalization and agreement patterns. Various European and Asian languages have been explored via a pilot survey study to expand the sample.

The sample languages display mainly two different patterns or strategies in marking the part–whole relationships in FPP: separative and locative. Using a questionnaire method and elicitation, the results were as follows: Arabic displays mostly the separative ("one from three") strategy, but English, Khmer, and Burmese languages have the locative strategy ("one in three"). The Hungarian marking involves the elative case, corresponding to separative ("from"), and Tunisian Arabic has both strategies ("in" and "from"). In addition to the locative and separative strategies, there is another widespread strategy for conceptualizing part–whole relationships:[34] the possessive strategy. In the possessive strategy, wholes are conceptualized as possessors and parts are conceptualized as possessed items. It is noteworthy that the first and second pilot survey and elicitation did not detect any possessive strategies for FPPs. This could be so, because FPPs are not the most common type of partitives, as the referents are more abstract and "one" may apply to many referents (as is the case with "one in three"). We found the possessive strategy of the structure "N1 linker N2" only after additional data query and elicitation in Khmer. Note that fractions that contain a possessive structure were found also in Hungarian, but these structures may be present in other languages as well, left for further study. One language may have several strategies of grammaticalization of FPPs. Khmer sports four options, three of which are locative ("in", "on", and "among"), and one is possessive ("of"). Tentatively, we can assume that the FPP type of fractionality and proportionality is not as compatible with possession as the separative and locative constructions are. At present, we can only conclude that due to lack of sufficient data we cannot generalize here.

[34] As described in Luraghi–Huumo (eds.): *Partitive cases and related categories*.

We found that genealogically distant languages may have similar strategies: Maltese, Standard and Gulf Arabic versus Hungarian (and Irish) are typologically similar in using the separative strategy. English, Burmese, Khmer, and partly, Tunisian Arabic are similar in using the locative strategy. Genealogically close languages, such as the Arabic variants, may thus diverge in their strategy type.

Note that for some languages, respondents reported different data, as some languages have multiple strategies for encoding various FPPs. Within the locative strategy, we have found two main types, the IN (as in English, Burmese, Khmer) and an additional ON (as in Italian, Dutch, Estonian, French, Norwegian, Khmer) strategies in our sample. Khmer also featured AMONG. The Hungarian adverbial strategy based on an essive N1 suggests an additional type that could be dubbed as a numerical state strategy or a similative AS. Additionally, interaction with and variation within definiteness markers emerged as a topic for further study, as in Italian, Hungarian, or Dutch: *een op (de) drie* 'one (on) the three'.

Agreement with FPP subjects can be divided in two types in our sample: variable and rigid. For example, Hungarian is "rigid" based on elicitation, as plural subject agreement—semantically motivated agreement—is rejected with the FPP phrase. Agreement between FPP subjects and the predicates in languages such as Hungarian is predominantly singular with "one in three", which we called "grammatical". This, however, has language-internal causes related to agreement with number (numeral) phrases. Language-internal causes explain the lack of plural agreement with languages such as Burmese as well, where semantic agreement cannot be observed as there is no subject–verb agreement. English (as spoken by Arab speakers) and Arabic (Maltese, Standard, Gulf, and Tunisian) display variation: agreement is singular or plural, grammatical or semantic. We have provided tables grouping languages according to their agreement patterns and the rigidness of the agreement patterns.

This research also explored some of the limits of the methods used for obtaining large-scale typological generalizations in exploring FPPs and subject-predicate agreement. Methodologically, our observation is that a larger translation-based questionnaire sample collection should be preceded by a study on subject agreement patterns, verb morphology, word order, and the structure of numeral phrases in the target languages.

This contribution has provided insights into partitives that are less studied, fractional proportions. Various open questions are left for further study. For instance, the pilot studies and the elicitation detect just one language, Khmer, with the possessive strategy for FPPs, but much variation between the forms of the locative strategy. Even well-studied languages such as Hungarian seem to have much regional variation and division of judgments about the data on FPPs.

List of abbreviations

1 – first person
3 – third person
ACC – accusative
ADJ – adjective
AS – similative
ADV – adverb(ial)
ALL – allative
ART – article
CLF – classifier
COP – copula
DAT – dative
DEF – definite
DU – dual
ELA – elative
F – feminine
FUT – future
INDF – indefinite
IPFV – imperfective
M – masculine
N – numeral; noun/nominal; neuter
NOM – nominative
OBJ – objective agreement; the object (function)
PART – partitive
PL – plural
POSS – possessive
PRT – particle
PV – preverb
SG – singular
SGM – singular masculine
SUF – suffix
TOP – topic
TR – transitive
TRA – translative
V – verb

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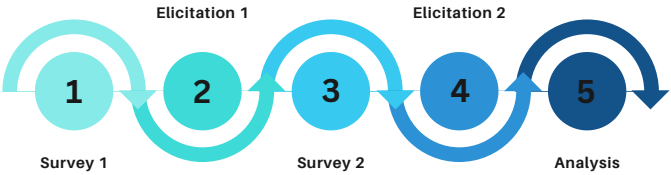
Appendix 1
Research design of the study on agreement and grammaticalization pattern of FPPS

THE RESEARCH DESIGN

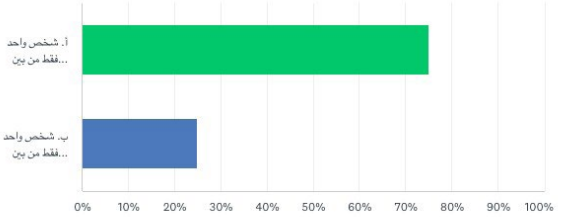


FPP Research design flow chart.pdf

Appendix 2
Results of the Arabic survey

أرغب في التنافس للحصول على منحة دراسية في جمهورية المجر:

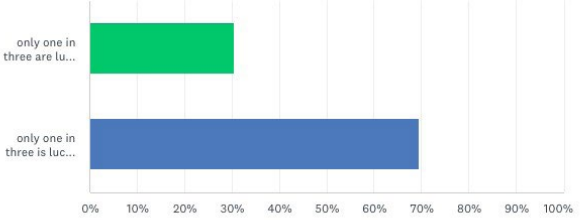
Answered: 36 Skipped: 0



ANSWER CHOICES	RESPONSES	
أ. شخص واحد فقط من بين ثلاثة أشخاص محظوظ للحصول عليها	75.00%	27
ب. شخص واحد فقط من بين ثلاثة أشخاص محظوظين للحصول عليها	25.00%	9
TOTAL		36

How would you finish the sentence: "I am applying for a scholarship in Hungary, but I know that

Answered: 36 Skipped: 0



ANSWER CHOICES	RESPONSES	
only one in three are lucky to get it."	30.56%	11
only one in three is lucky to get it."	69.44%	25
TOTAL		36