Ukrainian Aspect and Object Case in ukTenTen
The Partitive Genitive of Perfective Verbs and Mass Nouns

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Abstract   The goal of our study is to establish the usage patterns of the Ukrainian partitive genitive and accusative objects based on a corpus of modern Ukrainian (ukTenTen 2020). This article focuses on differences between concrete and abstract mass nouns as objects of perfective-imperfective verb pairs. Our corpus study targets relations between the grammatical aspect of verbs, Aktionsart prefixes and the partitive genitive, which has been traditionally associated with perfectivity. We found that Ukrainian imperfective verbs occur regularly with partitive genitive objects, and that aspect does not influence the object case of abstract mass nouns.

Keywords   Verb classes. Abstract nouns. DOM. Grammatical aspect. Incremental theme. Aspectual composition.

Summary   1 Introduction. – 2 The Ukrainian Case System and Intensional Verbs (the "Genitive Verbs"). – 3 Aspect in Ukrainian. – 4 Methods. – 4.1.1 The Selection of the Verbs for the Analysis. – 4.1.2 The Selection of Nouns for the Analysis. – 5 Results. – 6 Discussion. – 7 Summary.

1 Introduction

Ukrainian grammars often contain references to 'partitive genitive' and 'partiality' in their discussions of object case and Aktionsart prefixes. We review these discussions in our essay, as we found Ukrainian aspect and object case an understudied topic in the current partitive related research. The goal of our study is to examine more precisely to what extent the Ukrainian genitive-accusative object case alternation of mass nouns interacts with the Ukrainian grammatical aspect. We will make forays in areas where variation has already been discovered about the partitive genitive, checking the findings against the data in the ukTenTen 2020 corpus.[1] The main focus is on the differences between the occurrences of the genitive in the following three sentences, (1)-(3).[2]

(1)	*Цього*	*дня*	*годиться*	*зварити*	*борщу*	*з*	*півнем.*
	C'oho	*dnja*	*hodyt'sja*	*z-varyty*	*boršč-u*	*z*	*pivnem.*
	this	day	good	PREF-cook.PERF	borscht-GEN	with	rooster.INST

'On this day, it is good to cook borscht with a rooster.'

In Ukrainian grammars, 'partitive genitive' is a term for genitive case inflection with a specialised meaning of referring to quantities of referents, such as mass nouns as complements of perfective verbs. This phenomenon is illustrated with the ukTenTen corpus example (1), where *boršč* 'borscht', a concrete mass noun, appears in a sentence with a perfective verb and genitive case. Ukrainian has 'grammatical aspect', which is expressed in terms of 'perfective' and 'imperfective'

[1] For recent similar corpus studies on verb classes, see Jurkiewicz-Rohrbacher 2019; Laugalienė 2022; Vaiss 2022.

[2] Because of space restrictions, we notify the reader only here that translations of the citations in Ukrainian, Ukrainian examples, and the glosses of examples from previous sources are provided by Lesia Chaika and Natalia Lehka. The translations of the lists of the functions of the genitive case in Ukrainian (Šypovyč, Ihnatolja, Dančenko 2020, 199), groups of verbs used with the genitive (as in Mežov 2008, 5-6) and with the accusative (Pljušč 2005, 104-6) are given without providing the original texts, translated by Lesia Chaika and Natalia Lehka.

verb forms. Aspect is often discussed in terms of aspectual pairings in Ukrainian literature on the topic (Vyxovanec', Horodens'ka 2004; Pljušč 2005), and Slavic in general (Jakobson 1971; Timberlake 1975; Comrie 1976; Dahl 1985). This distinction will become relevant in this essay as well.

(2)   *Прохолодний*   *душ*   *зранку*   *додасть*
      Proxolodnyj   *duš*   *zranku*   *dodast'*
      cool   shower   in.morning   PREF.add.PERF
      бадьорост-і   *і*   *свіжості*   *тілу.*
      bad'orost-i   *i*   *svižosti*   *tilu.*
      vigour-GEN   and   freshness   to.body
      'A cool shower in the morning will add vigour and freshness to the body.'

In example (2), the abstract mass noun *bad'orist'* 'vigour' appears in a sentence with a perfective verb and genitive case, so it can well be considered as an example of partitive genitive. A central question of this essay concerns the opposition between sentences in (2) and (3). In (3), the genitive of an abstract noun appears in a sentence with an imperfective verb.

(3)   *Такий*   *напій*   *додає*   *бадьорост-і,*   *а*
      Takyj   *napij*   *dodaje*   *bad'orost-i*   *a*
      such   drink   PREF.add.IMPF   vigour-GEN   and
      приготувати   *його*   *надзвичайно*   *просто.*
      pryhotuvaty   *joho*   *nadzvyčajno*   *prosto.*
      prepare   it   extremely   easy
      'Such a drink adds vigour, and it is extremely easy to prepare.'

We will discuss data that suggest that it is not completely unproblematic to assume a partitive genitive with abstract nouns, and that grammaticalisation may have affected groups of mass nouns differently depending on verb classes. The case alternation of *boršč* 'borscht' and other Ukrainian mass nouns in our sample that are concrete (*voda* 'water' and *cukor* 'sugar') follow the well-known Slavic pattern of partitive genitives, but the abstract nouns such as *bad'orist'* 'vigour' do not. Tentatively, we will discuss the variation and grammaticalisation patterns with genitive objects to two possible causes: verb classification and semantic differences between abstract versus concrete mass nouns.

     The Ukrainian partitive genitive has parallels in many Baltic and Slavic languages (see Kiparsky 1998; Padučeva 1998; Chuikova 2012; 2021; Paykin 2014; Seržant 2014; Breu 2020). This linguistic phenomenon has increasingly been studied since Wierzbicka's work (1967).

Wierzbicka posed questions about the reasons for the different combinability of Polish perfective and imperfective verbs with measure and quantity object phrases, and she shows that imperfective Polish verbs do not occur with measure or quantity objects.[3] Vyxovanec' (1992, 120) describes two types of partitive genitive in Ukrainian. The first type is called the 'quantitative partitive', and it indicates incomplete coverage of the object by the action, like some portion of milk that is bought, as in (4a). The second type is the 'temporal partitive', which indicates the complete coverage of the object by the action, but with a limitation on this action in time, as in (4b).

(4)

a. *Дівчина   купила   молока.*
    Divčyna   kupyla   moloka.
    girl   bought.PERF   milk.GEN
    'The girl bought milk.' (understood as indefinite quantity: some milk)

b. *Він   позичив   лопати.*
    Vin   pozyčyv   lopaty.
    he   PREF.borrowed.PERF   shovel.GEN
    'He borrowed a shovel.'

We will concentrate on the quantitative partitive genitive as in (1) and (4a) in this article. We will typically use the term 'genitive' in this essay for the case inflection, as we examine more precisely to what extent the Ukrainian genitive case is an object case used for mass objects of perfective verbs (the quantitative partitive genitive).

Some notes on the terminology as used in this essay are in order, before discussing the sources and the corpus data. We apply the term 'aspect' for a wider range of phenomena that pertain to the properties of events or the linguistic means to express them. The adjective 'aspectual' is also understood here in a wider sense. It includes also what has been referred to as Aktionsart that emerges in derivation,

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3 The case alternation of accusative and genitive in Slavic and Baltic bears resemblance to the Finnic accusative-partitive object case alternation as described in sources such as e.g., Kiparsky 1998; Klaas 1999; Metslang 2001; Huumo 2010; Lees 2015; Seržant 2015; or Larjavaara 2019. In Larsson 2001 and Luraghi, De Smit, Igartua 2020 it is argued that the partitive case in Finnic languages has arisen because of Baltic and Slavic influence. This essay cannot do justice to the vast Russian based literature on the phenomenon. The writing has been much influenced by the literature on Finnic and aspectual composition and discussions of partitive in Germanic (see, e.g., Sleeman, Giusti 2021 for recent literature, and a Czech-Dutch comparison, Vymazalová 2014). More on Polish aspectual composition can be found in Młynarczyk 2004 and Rozwadowska, Willim 2004; on Czech and several other Slavic languages, see Filip 1997.

to lexically encoded properties of verbs with their arguments, quantificational and referential properties of the arguments that relate to the properties of events, and some event-delimiting or event-modifying adjuncts. In various discussions of aspect, often, the term 'incremental theme' is used (Dowty 1991; Krifka 1992) for a thematically related object that increases, decreases, or changes in some other way in a series of a fixed scale during the event that the verb denotes. 'Incremental theme verbs' are verbs that denote the processing of their objects (themes) piecewise, portion by portion, like in eating (an apple), or adding (add more borscht onto a plate).[4] 'Intensional verbs' are a working term we use as shorthand for various groups of verbs that impose special semantic or referential properties on their objects, which we will clarify in the present essay. Suffice it to say here that intensional verbs are frequently classified as genitive verbs in Ukrainian grammars (like verbs denoting wishes, desires, demands, or wanting something). As opposed to incremental theme verbs that encode a change, intensional verbs do not encode a change.

Note, however, that we use the term 'aspect' as shorthand for 'grammatical aspect' as in the opposition of *dodaty* PERF and *dodavaty* IMPF 'add' and *zvaryty* PERF and *varyty* IMPF 'cook'. Verbs that appear in such perfective-imperfective pairs are called 'aspectual pairs' in this article. The two counterparts or members of aspectual pairs are called 'partners'. Thus, examples of the 'perfective partners' of these grammatical aspectual pairs are *zvaryty* PERF and *dodaty* PERF, and the 'imperfective partners' are *varyty* IMPF and *dodavaty* IMPF. We use 'Aktionsart' for derivational verbal prefixation, which typically modifies the lexical meaning of the basic lexical verb, as in *do-davaty* IMPF 'add'.[5] Note that the word-for-word translations of the prefixed verbs do not always allow to distinguish the meaning of the derived and underived verb versions as easily as in *do-davaty* IMPF 'add' and *davaty* IMPF 'give'. In these forms, the addition of *do-* resembles the English *to*, denoting a goal: 'give (more) to' is a kind of 'add'. The German *zu-* or the Dutch *toe-* are also similar in combinations with verbs, and in a similar way, these combinations

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4 Incremental theme is a central concept in discussing the temporal relationship between verbs and objects in the events they denote, also in Slavic (cf. Zuchewicz 2020). Event types as well as verbs and their arguments that can express these events are often discussed using the terminology of 'aspectual classes' or 'Vendler classification' of states, activities, accomplishment, and achievements following Vendler 1957, sometimes referred to as 'actionality'.

5 The description here is simplified much and presented here for establishing basic terminology to operate with, not to take a stand in much debated issues. Perfectivity is distinguished from telicity, even though the phenomena they cover tend to overlap (cf. Borik 2006; Tamm 2007, see also these sources for testing for these phenomena). Also, the term 'boundedness' is frequently used to capture the semantic parallel between verbal aspect and object matter.

are seldom completely transparent. Such derivational pairs will not be referred to as 'aspectual pairs' but as 'verb forms', if they do not change the grammatical aspect of the verb. If it is relevant in the ensuing discussion to be precise, we use 'grammatical aspect' for perfectivity and imperfectivity. Since we regularly express thoughts about nouns and verbs in the same sentence, we frequently simplify the terminology in use. For the same reason of brevity, we frequently use 'concrete' and 'abstract objects' instead of "object complements that are in the singular number and denote concrete mass concepts and abstract mass concepts".

Our goal is to describe, based on previous literature on Ukrainian, how the genitive of the object relates to the properties of the verbs (specifically, grammatical aspect, Aktionsart, and lexical semantics or verb classification) and the properties of the noun. Our further aim is to clarify the extent of the variation in Modern Ukrainian based on a corpus study (ukTenTen 2020). We explore the patterns and their cause with special focus on mass nouns that vary on the scale of concreteness and abstractness.

In the empirical corpus study, we focus on a selection of the accusative-genitive alternation with typically prefixed verbs with perfective and imperfective aspect, such as *do-daty* and *do-davaty* 'add' and *z-varyty* and *varyty* 'cook' in order to examine if the object case depends on the grammatical aspect, on the Aktionsart, and the quantificational properties of the object noun. We examine the following 'testing factors' that pertain to grammatical aspect, Aktionsart prefixes, and nominal quantification.

1) Grammatical aspect: Is there a distinction between perfective and imperfective verbs in terms of genitive and accusative object marking?

2) Verbal (aspectual or Aktionsart) prefixes and lexical semantics: Are there differences between verb prefixes that are related to partiality in previous literature on Ukrainian, such as *z-/s-*, *do-* and *na-*?

3) Nominal properties: Do concrete mass nouns and abstract mass nouns display differences in object case marking?

The essay is structured as follows. In Section 2, we discuss the genitive case in the Ukrainian case system and its functions, including the object function. In Section 3, we discuss the Ukrainian aspect. Section 4 describes the corpus method. Section 5 presents the results, Section 6 is a discussion, and Section 7 is a summary.

2   The Ukrainian Case System and Intensional Verbs (the "Genitive Verbs")

Pljušč (2018, 120; 2005, 107) writes that the partitive genitive is (mostly) combined with perfective and not with imperfective verbs.[6] Pljušč (2005, 107) also notes that, in this case, the noun is mass and has indefinite content, in the wording of Pljušč, "indefinite content and the measure of manifestation of materiality" (*neoznačenist' vmistu, miry vyjavu rečovynnosti*). She notes that the accusative is also possible in these environments, with the condition of the object being completely covered by the action (5). There is no mention of bare plurals.

(5)   *Спечем*   *картоплю*   *при*   *зорі*   *і*   *юшки*   *наготуєм.*
       Spečem   *kartoplju*   *pry*   *zori*   *i*   *juški*   *nahotujem.*
       PREF.bake.PERF   potato.ACC   under   star   and   soup   prepare
       'We bake the potatoes in twilight/under the stars and prepare soup.'

Let it be briefly noted, before a more thorough discussion, that next to the partitive genitive, the objects in negated sentences and objects of a variety of verb classes can be in the genitive. The examples are taken from Pugh and Press's work (1999, 98; 256), provided in (6).[7]

(6)

a.   *Він*   *не*   *продав*   *стола.*
     Vin   *ne*   *prodav*   *stola.*
     he   NEG   PREF.sold.PERF   table.GEN.SG
     'He did not sell a table.'

b.   *Ми*   *чекали*   *автобуса.*
     My   *čekaly*   *avtobusa.*
     we   waited.1PL.IMPF   bus.GEN.SG
     'We were waiting for a bus.'

c.   *Хочемо*   *спокою/*   *миру.*
     Xočemo   *spokoju /*   *myru.*
     want.1PL.IMPF   peace.GEN   peace.GEN
     'We want peace.'

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6   Pljušč (2018, 120) also refers to Kuznecova with year 1963 and page number 18, but this source is not found among Pljušč's references. It has been noted (see Kiparsky 1998; Padučeva 1998; Chuikova 2012; 2021; Paykin 2014, among others) that the partitive genitive in Russian can combine also with imperfective verbs under some circumstances.

7   See Kryshevich 2010 for an account of the Ukrainian genitive of negation.

d.	*Ми*	*чекали*	*п'ятий*	*автобус.*
	My	*čekaly*	*p"jatyj*	*avtobus.*
	we	waited.1PL.IMPF	fifth[ACC.SG]	bus[ACC.SG]
'We were waiting for bus no. 5.'

In (6a), the direct object appears in the genitive case because of the negation in the sentence. In (6b) and (6c), the genitive case depends on the verbs such as *čekaty* 'wait' and *xotity* 'want'. However, if the object is specified, the accusative case is attested (6d). According to Pugh and Press (1999, 256) verbs of wanting, desiring, demanding and wishing are mostly used with genitive if the object is an abstract noun, a concept, unspecified, or unknown – we apply the terminology 'intensional verbs' to this group.[8] In Ukrainian grammars, the genitive case is described as having various functions (Šypovyč, Ihnatolja, Dančenko 2020, 199). The genitive can appear on the following types of objects:

1. direct objects with verbs with the negation particle *ne* 'not', as in (6a);
2. direct objects that are quantitatively not specified or specified just partially (partitive genitive) (*kupyv medu* '(he) bought honey', *prynis soli* '(he) brought salt', *nabery vody* 'fill it with water');
3. with collective nouns (*zahin dobrovol'civ* 'a detachment of volunteers', *hurt divčat* 'a group of girls') and with nouns of measure (*centner borošna* 'centner of flour', *kilohram cukru* 'kilogram of sugar').

For more detailed information about the rest of the functions of the genitive, see Šypovyč, Ihnatolja, Dančenko (2020, 199).

Mežov (2008, 5-6) points out that there are seven groups of verbs where the nouns bearing the genitive case are direct objects without the partitive meaning:

1. verbs of desire, will, achievement of the result, e.g., *xotity* 'want', *bažaty* 'wish', *volity* 'prefer', *vymahaty* 'demand', *domahatysja* 'aspire', *dosjahaty* 'achieve', *žadaty* 'desire', *potrebuvaty* 'need', *prahnuty* 'strive for';
2. verbs of avoiding an object, e.g., *bojatysja* 'fear, be afraid of', *ljakatysja* 'get scared', *osterihatysja* 'beware', *storonytysja* 'avoid', *straxatysja* 'fear', *unykaty* 'avoid', *curatysja* 'shun' etc);

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8 As our goal is to review how traditional Ukrainian grammars describe the partitive genitive related phenomena and not to improve the descriptions, we occasionally indicate in a footnote if a Ukrainian source does not specify useful information for our later discussion or if a reviewer has suggested improvements of the descriptions.

3. verbs of depriving of an object, e.g., *pozbavljaty* 'deprive', *zrikatysja* 'renounce';
4. verbs of expecting an object, e.g., *čekaty* 'wait', *očikuvaty* 'expect, await', *dočekatysja* 'wait until (something)', *ždaty* 'wait';
5. verbs of relation to an object, e.g., *dotrymuvatysja* 'follow, observe (e.g., a rule)', *trymatysja* 'persist; hold on to, clutch', *torkatysja* 'touch';
6. verbs of learning, acquiring an object, e.g., *učytysja* 'learn', *navčatysja* 'study';
7. verbs of sufficient coverage of an object (the word *enough* appears frequently if these verbs are translated), e.g., *napytysja* 'drink enough, get drunk', *najistysja* 'eat enough/be full', *nasluxatysja* 'listen enough', *nadyvytysja* 'watch enough (of something)'.

Pljušč (2005, 104-6) also describes groups of verbs that take accusative objects. She claims that the semantics of their objects varies because of the semantics of the respective verbs, and she distinguishes the following verb groups:
1. verbs with the semantics of physical action (e.g., *buduvaty mist* 'build a bridge'). They are used with inanimate objects and sometimes with animates in the accusative case. If an accusative object is used with an imperfective verb, it can express an external object fully covered by the action. If it is used with a perfective verb, then it expresses a "resultative object";
2. verbs with the semantics of movement in space. They are used with abstract nouns, animates, or nouns denoting objects (things) (e.g., *pryvezty vuhillja (učniv)* 'bring coal (students)');
3. verbs with the semantics of speech. With these verbs, the accusative case marks a specific conversation object or an abstract object that must be specified by the addressee (e.g., *rozkazaty kazku* 'tell a fairytale', *opysaty portret* 'describe the portrait', *sxarakteryzuvaty heroja* 'describe the character');
4. verbs with the semantics of an intellectual activity. In this case, the object in the accusative case can be an abstract noun, sometimes a specific noun, or a noun denoting a person or another animate (e.g., *tvoryty čudo* 'create a miracle', *doslidyty problemu* 'study the problem', *učyty virš* 'learn a poem');
5. verbs with the semantics of an internal condition of a person, expressing feelings. Such verbs are used with abstract nouns in the accusative case. This meaning type is primarily characteristic of the accusative objects that are expressed by an abstract noun (e.g., *cinuvaty spokij* 'appreciate peace', *ljubyty krasu* 'love beauty', *šanuvaty starist'* 'respect old age').

According to Vyxovanec' (1992, 119), the accusative is the main direct object case used in modern Ukrainian; however, the genitive case can also mark a direct object (Vyxovanec' 1992, 120). One of the features that distinguishes the accusative case from the genitive in Ukrainian is partitivity. While the genitive case indicates the partitive meaning of the object, the accusative is not compatible with that meaning. Vyxovanec' (1992, 120) describes two types of partitive genitive. Vyxovanec' (1992, 120) calls them quantitive and temporal uses of the genitive; see example (4). Nouns that can denote partiality or divisibility (*častkovist' abo podil'nist'*) in the genitive usually refer to substances (materials), for instance, *moloko* 'milk', *voda* 'water', *xlib* 'bread', *m"jaso* 'meat', *ryba* 'fish', *sil'* 'salt' (Vyxovanec' 1992, 120). Ševčuk (2010, 131) extends the number of nouns that are used in the partitive genitive case and divides them into classes. Ševčuk (2010, 131) as well as Vyxovanec' (1992) specify that the partitive genitive can mark nouns denoting various materials, substances, man-made items or products of natural origin, such as metals (*bronza* 'bronze', *sriblo* 'silver', *zalizo* 'iron'), chemical elements (*kysen'* 'oxygen', *voden'* 'hydrogen'), liquids (*voda* 'water', *olija* 'oil', *moloko* 'milk'), fabrics (*šovk* 'silk', *polotno* 'canvas', *sytec'* 'chintz'), food (*boršč* 'borscht', *kava* 'coffee', *sil'* 'salt', *xlib* 'bread'), medicines (*aspiryn* 'aspirin', *cytramon* 'citramon'), plants (*morkva* 'carrot', *kavun* 'watermelon', *kalyna* 'viburnum'), materials (*visk* 'wax', *pisok* 'sand', *cement* 'cement'). Pljušč (2005, 107) also mentions that the partitive genitive appears with nouns of materials and substances such as metal, loose, liquid, and gaseous items, drinks, or food etc.

Pljušč (2005, 82) gives an explanation about Ukrainian abstract nouns: "Nouns with an abstract meaning include generalisations of objectified concepts – qualities, properties, actions, processes; for example, diligence, kindness, blueness, learning, acceleration, dimension, flight". She points out that a sizable number of abstract nouns have only a singular form and some of them have only a plural form (e.g., *košty* 'money', *zaručyny* 'engagement', *vybory* 'elections'). Abstract nouns are usually formed based on adjectives or verbs and by means of suffixes such as *-ist'*, *-ot(a)*, *-ann(ja)*, *-enn(ja)*, etc. (Pljušč 2005, 82). Pljušč (2005, 82) also mentions that abstract nouns can be used with an indirect meaning. In that case, they lose or gain in their abstractness (e.g., *polum"ja v peči* 'flame in the cooker' and *polum"ja sercja* 'flame of the heart', *raptovyj vyxor* 'sudden whirlwind' and *vyxor dumok* 'whirlwind of thoughts'). Therefore, there is no strict division of nouns by concreteness and abstractness.

This essay focuses on singular nouns only. To render the examples easily readable for a non-Ukrainian speaking reader, a brief note on the Ukrainian nominal paradigms is in order. Ukrainian nouns have cases, numbers, and genders. There is a feminine, masculine, neutral and common gender. In the Ukrainian case paradigm, there are

seven cases: nominative, genitive, dative, accusative, instrumental, locative and vocative. There are also four declensions. Nouns of the same gender can still receive diverging endings if they belong to different declensions, which means that the ending of a form must be seen in its place in the case paradigm. The ending that sounds identical can fill a different function, for instance, *-y*, *-i*, *-a* or *-u* in different genders, numbers, and declension classes. For instance, the noun *vodu* with the ending *-u* is accusative as it is feminine, while the noun *borščču* with the ending *-u* is genitive as it is masculine. In our study, in combinations with perfective and imperfective verbs, we have used nouns such as *voda* 'water', *bad'orist'* 'vigour', *boršč* 'borscht', *cukor* 'sugar', *optymizm* 'optimism', *vpevnenist'* 'confidence' and *dosvid* 'experience'. All these nouns have genitive and accusative forms, and semantically they are mass nouns; see Section 4 for more details on the principles for selection. For our further discussion, it is relevant to note the semantic distinction between count and non-count nouns. Non-count nouns are typically mass nouns, and mass nouns can be concrete and abstract. Nouns have two numbers, singular and plural, and it is relevant that not all abstract nouns are also mass nouns: they can be counted and pluralised.

In the sources above, which served as our basis for corpus study, we found less material on abstract mass nouns than would have been necessary for a more thorough discussion of partitive genitive objects in Ukrainian. The question of why concrete mass nouns and abstract mass nouns display differences in object case marking was not explicitly addressed in the Ukrainian sources we consulted. We did not find discussions of groups of abstract mass nouns concerning their semantic groups or their status as instances of partitive genitive. However, abstract mass nouns were occasionally used in examples illustrating other points about the structure of Ukrainian, and we have included many of them in our literature review and considered them in the discussion of the results of our empirical corpus study.

3 Aspect in Ukrainian

Ukrainian verbal categories are tense, mood and aspect.[9] This essay considers only aspect. The category of aspect is inherent to all Ukrainian verbs. The category of aspect allows the expression of actions and states as whole (*cilisnist'*) and not whole (*necilisnist'*). Ukrainian grammars distinguish two main types of verbs: perfective verbs

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9 There are also categories of number, gender and person, but according to Vyxovanec' and Horodens'ka (2004, 223), these categories are not particular verbal categories, since they belong to other parts of speech as well.

(*dokonani dijeslova*), which express a completed action, and imperfective verbs (*nedokonani dijeslova*), which express action in progress (Vyxovanec', Horodens'ka 2004, 225).[10] Ukrainian sources describe the formation of perfective and imperfective verbs by the morphological processes of prefixation or suffixation. Typically, perfective verbs are formed based on imperfective verbs, by prefixes. This process is called "perfectivisation". Imperfective verbs can be formed based on perfective verbs by suffixes. This process is called "imperfectivisation" (Vyxovanec', Horodens'ka 2004, 225). Such morphologically related perfective and imperfective verbs form an aspectual pair. In our essay, we illustrate the following pairs of aspectual verbs, among others: *dodaty* (PERF) – *dodavaty* (IMPF) 'add', *zvaryty* (PERF) – *varyty* (IMPF) 'cook', *nabuty* (PERF) – *nabuvaty* (IMPF) 'gain', *dovaryty* (PERF) – *dovarjuvaty* (IMPF), *navaryty* (PERF) – *navarjuvaty* (IMPF), and *pobažaty* (PERF) – *bažaty* (IMPF). However, Vyxovanec' and Horodens'ka (2004, 225) point out that not all verbs form aspectual pairs. To form an aspectual pair, verbs must have an identical lexical meaning. Often, however, perfective verbs that are formed based on an imperfective verb via prefixation do not only change the grammatical aspect but also the lexical meaning of the verb.[11] Imperfective verbs that denote actions, processes and states in progress that evolve towards a boundary readily form an aspectual pair with perfective verbs that denote the completeness of action, progress, or state, as in PERF: *zvaryty* and IMPF: *varyty* 'cook'. Imperfective verbs whose meaning does not evolve towards a boundary do not form an aspectual pair with perfective verbs, because the action, progress or state cannot be completed, as in *bihaty* 'run', *xodyty* 'walk', *smijatysja* 'laugh', *plavaty* 'swim' (Vyxovanec', Horodens'ka 2004, 225).

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[10]   This corresponds to what is referred to in Verkuyl's (1993) terms as a distinction of durative and terminative or, in other sources, to unbounded and bounded, atelic and telic (e.g., Dahl 1985; Krifka 1992). However, the Ukrainian aspect is grammatical, which means that typically verbal aspect does not contribute to the clausal aspect compositionally as it does in the aspectual systems of typically discussed languages (which are Germanic). The Ukrainian aspect typically does not pertain to the internal structure of events composed of each other and in combination with the properties of internal arguments (e.g., van Hout 2000), but to the viewpoint on the situation or event. The viewpoint is taken either from the outside (on the event or a situation as a whole) or from the inside (from the internal course of the event or situation), as described, for instance, in Comrie 1976, Dahl 1984 and 1985, and Smith 1991. In sum, we do not expect the properties of the object to influence the aspectual semantics in a clause. There is one more type of verbs, those that can express both perfective and imperfective meaning. We do not discuss it here, because we did not examine this verb type in our corpus study, leaving it for further research.

[11]   Vyxovanec' and Horodens'ka (2004) do not explicate aspectual pairs with the verb we use, 'cook'. Our rendering of their description applied to 'cook' is that the imperfective *varyty* 'cook' can be perfectivised as *z-varyty* with the prefix *z-* without a change in the lexical meaning. This is thus an aspectual pair. The verb can be prefixed by an Aktionsart prefix, as in *perevaryty* with the prefix *pere-*, rendering an extra lexical meaning of 'boil too much, overcook' to the verb. This is not considered as an aspectual pair.

In our essay, we focus mainly on verbs that form an aspectual pair. Vyxovanec' and Horodens'ka (2004, 227) claim that the number of aspectual pairs in Ukrainian is small. Imperfective verbs that are formed based on perfective verbs by means of suffixation preserve the identical lexical meaning and differ from the perfective verb only in aspect, while perfective verbs that are formed based on imperfective verbs by means of prefixation can change the verb's lexical meaning. The examples in Table 1 based on how Macjuk (2013, 169) distinguishes the ways of formation of aspectual verb pairs.

Table 1 The ways of forming Ukrainian aspectual verbs

Formation	Imperfective form	Perfective form
alternation of suffixes	*kup-uva(ty)* 'buy'; *dopys-uva(ty)* 'finish writing'	*kup-y(ty)* 'buy'; *dopys-a(ty)* 'finish writing'
change of the place of stress	*sklykáty* 'convene'; *zasypáty* 'fill up'	*sklýkaty* 'convene'; *zasýpaty* 'fill up'
adding prefixes, most often *z- (s-)*, *za-*, *na-*, *po-*, *pry-*, *pro-*	*pysaty* 'write'; *v"januty* 'wither'	*na-pysaty* 'write'; *zi-v"januty* 'wither'
adding prefixes and changing suffixes at the same time	*pad-a(ty)* 'fall'; *viš-a(ty)* 'hang'	*v-past(ty)* 'fall'; *po-vis-y(ty)* 'hang'
adding prefixes to verbs with a different but semantically similar root	*braty* 'take'; *govoryty* 'talk'	*v-zjaty* 'take'; *s-kazaty* 'talk'
alternation of the sounds in the root	*zbyraty* 'collect'; *nazyvaty* 'name'; *posylaty* 'send'	*zibraty* 'collect'; *nazvaty* 'name'; *poslaty* 'send'
a simultaneous alternation of the sounds in the root and a change in the suffixes	*zmitaty* 'sweep away'	*zmesty* 'sweep away'

Vyxovanec' and Horodens'ka (2004, 227) specify that the main suffixes that are used for imperfectivisation are the suffixes *-uva-*, *-ovuva-*, *-va-* and *-a-*. They also emphasise that only imperfective verbs that evolve towards a boundary can form an aspectual pair with perfective verbs that are built up via prefixation. Such imperfective verbs tend to include verbs of concrete physical actions or types of intellectual activities (Vyxovanec', Horodens'ka 2004, 227-8). See also Vyxovanec' and Horodens'ka (2004, 228-32), who discuss the formation of imperfective and perfective verbs in more detail than Macjuk, whose aim with aspect verbs is L2 instruction.

Since in our corpus study we used mostly perfective verbs such as *dodaty* 'add', *navaryty* 'cook any amount' and *zvaryty* 'cook', we

focus on the prefixes *do-*, *na-* and *z-* as described by Vyxovanec', Horodens'ka (2004, 228). They claim that the prefixes *z-/s-* (and *po-*) are the main prefixes that form perfective verbs without creating new lexical meanings.[12] Even if they are, the meanings of imperfectivised verbs are identical to the meaning of the respective primary imperfective verbs without prefixes (Vyxovanec', Horodens'ka 2004, 228). So, we can state that the verb *zvaryty* PERF 'cook' in our examples expresses only completed action – 'cooked borscht' – in contrast to its aspectual partner in the pair, *varyty* IMPF 'cook', which denotes a process of cooking. The prefixes *na-* and *za-* may also be used to form the aspectual, perfective partner from an imperfective verb, but not as often as with *z-/s-* (and *po-*). Unfortunately, the source (Vyxovanec', Horodens'ka 2004) does not contain precise information about the prefix *do-*, which is the Aktionsart prefix of the verbs *dodavaty* 'add' and *dodaty* 'add' from our corpus data. However, Ševčuk (2010, 129) notes that "[t]he prefixes *v-(u-)*, *vy-*, *vid-*, *do-*, *z-(s-)*, *na-*, *nad-*, *pere-*, *pid-*, *po-*, *pry-*, *pro-* can give the verb an additional meaning of partiality, limitation of action in time". Vyxovanec' and Horodens'ka (2004, 229-30) also point out the partiality related to time in the semantics of these prefixes and elaborate on each of these prefixes. Ševčuk (2010, 129) specifies that "[p]refixed verbs (with prefixes *v-(u-)*, *vy-*, *vid-*, *do-*, *z-(s-)*, *na-*, *nad-*, *pere-*, *pid-*, *po-*, *pry-*, *pro-*) can be combined with a noun in the genitive and accusative cases. [...] Verbs of the perfective form with the prefix *na-* function in combination with nouns in the genitive case". Vyxovanec' (1992, 120) also mentions that the quantitative partitive genitive can be used with verbs with the prefixes *v-(u-)*, *vy-*, *vid-*, *do-*, *z-(s-)*, *na-*, *nad-*, *pere-*, *pid-*, *po-*, *pry-*, and *pro-*.

These relevant pointers based on the literature lead us to our corpus testing factors 1 and 2, as identified in the Introduction. In sum, the reviewed Ukrainian grammars and studies suggest that genitive objects appear with the perfective and not with the imperfective verbs, and that the appearance of 'quantitative partitive genitive' may depend on the nature of the prefixes.[13]

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12 Usually, imperfective verbs are not formed on the basis of perfective verbs with the prefixes *z-/s-*. From an imperfective verb such as *varyty* IMPF 'cook', Ukrainian can rather productively create a perfective verb *zvaryty* PERF 'cook'. The verb *zvaryty* PERF 'cook' cannot be further productively imperfectivised by aspectual suffixation. There is a verb that is imperfectivised on the base of the perfective verb, *zvarjuvaty*; however, it has a lexicalised semantics: 'weld'. In rare cases, perfective verbs with the prefix *z-/s-* can form an imperfective verb by suffixation. In these cases, the imperfective verbs have the same lexical meaning as the imperfective verbs without the prefix; for example: *nyščyty* IMPF 1 – *znyščyty* PERF – *znyščuvaty* IMPF 2 'destroy'. According to the authors (Vyxovanec', Horodens'ka 2004, 228), the imperfective verbs *nyščyty* and *znyščuvaty* have an identical lexical meaning.

13 For a more formal approach to aspect and prefixation in Czech and several other Slavic languages, see Filip 2003.

4   Methods

We conducted a corpus search of accusative and partitive genitive mass noun objects to determine their occurrence with aspectual pairs in Ukrainian. The extended results are available online, in a data sheet (osf.io/qcnx8).

We used Sketch Engine for our sample, more specifically, the "ukTenTen", the corpus of Ukrainian from 2020. The reason for choosing Sketch Engine (Kilgarriff et al. 2004; 2014) for the empirical study is that it is a large database system that contains 600 corpora in more than 90 languages. It is a tool for linguists that helps to understand how different languages work. Sketch Engine allows for conducting analyses of texts and shows what is typical, what is uncommon, and what is not attested in languages. It enables finding examples of usage of a word or a phrase, collocations, or patterns and in establishing variation.

The Ukrainian corpus ukTenTen20 contains texts that were collected on the Internet, and it is a part of the TenTen corpus family, which consists of web corpora that were created using identical principles and methods. It has a target size of 10+ billion words. The data for the Ukrainian Web Corpus 2020 were taken from texts from May 2014 to July-August 2020. The corpora contain 2.5+ billion words and more than 3.2 billion tokens. There are four subcorpora in the corpus: Ukrainian TLD.ua, Ukrainian Web 2014, Ukrainian Web 2020 and Ukrainian Wikipedia 2020.

4.1   The Selection of the Verb-Noun Combinations for the Analysis

In Section 3, we searched in earlier literature what is established about Ukrainian verb classes that have alternating object cases. Then we searched what earlier sources had specified about the semantic properties of the object types that can undergo case alternation. We relied on the sources described in Sections 1-3 that contained Ukrainian verb and noun lists with their description. In those sources, we identified the properties of verbs and objects that were classified according to their role in the choice of the object case (Timberlake 1975; Vyxovanec' 1992; Pugh, Press 1999; Vyxovanec', Horodens'ka 2004; Pljušč 2005; Mežov 2008; Ševčuk 2010; Pljušč 2018; Šypovyč, Ihnatolja, Dančenko 2020).

More specifically, concerning the 'aspectual' testing factor 1 for the corpus study, one relevant point raised in previous literature concerns the distinction between perfective and imperfective: the Ukrainian partitive genitive is known to appear with perfective and not with imperfective verbs (Pljušč 2005, 107; 2018, 120). For the

'Aktionsart' testing factor 2, we mainly followed the lead in Ševčuk (2010, 129), who mentions prefixes that add the additional meaning of partiality (*častkovist'*) and boundedness or delimitedness of the action in time (*obmežennja diji u časi*). Also, Vyxovanec' (1992, 120) discusses prefixes related to partitivity. These sources determined how we chose the prefixes that are related to partitivity in previous literature, *z-/s-*, *do-* and *na-*. The literature on the exact semantic constraints on the partitive genitive nouns was, however, scarce. We followed Ševčuk (2010) for finding concrete mass nouns. Although Pljušč (2005) does not write about partitive genitives with abstract nouns, we use the discussion in Pljušč (2005, 82) to explore the testing factor 3, 'partitive genitives factor' about the case alternation on mass nouns. The ensuing subsections detail the choice of testing materials.

4.1.1 The Selection of the Verbs for the Analysis

We deselected verbs that do not have object genitive-accusative case alternation: verbs that have only genitives as their object markers (intensional verbs). We also deselected verbs listed as verbs with only accusative objects in the verb lists. We excluded reflexive verbs. The verbs without an aspectual partner, those without a clear and transparent aspectual pair, were also excluded. Only verbs that formed clear aspectual pairs as represented in Table 1 – either with a suffix, prefix or other ways as specified in earlier Ukrainian sources – were chosen.

We searched for verbs with a general meaning that can also form a combination with a prefix. We were also searching if there were pairs formed with a more general perfectivising prefix, which is in some sources – but not in traditional grammars – referred to as 'empty' (such as *z-/s-*). In those pairs, we also searched for the perfective verb with another prefix (such as *po-*, *pere-*, *do-* or *na-*).

In terms of prefixation, we excluded semantically opaque combinations, thus resulting in a specialised lexicalised meaning; this restriction excluded many verbs from the selection. The selected combinations of the verbs and the prefixes were transparent in meaning, with no special lexical restrictions on the objects. We found the combinations with the prefixes *na-* and *do-* suitable, as they are mentioned as prefixes with the ability to function as quantifiers of mass objects. We aimed at verbs that allow 'portioning' their objects, in other words, mostly incremental theme verbs. These verbs allow combinations with mass nouns. Specifically for corpus testing, they were selected and categorised according to their ability to combine or not to combine with mass nouns. Additionally, the verbs were selected and classified as either allowing concrete themes as objects (such as *varyty* 'cook'), abstract ones (such as *nabuty* 'gain, acquire'), or both (such as *dodaty* 'add'). A pair of intensional verbs, the invariantly genitive-object verbs

pobažaty PERF, *bažaty* IMPF 'wish', were added in the corpus search and elaborated on briefly in the discussion section for comparison.[14] Table 2 summarises the grammatical aspect and prefix type of the verbs in the study, as well as the type of mass object they allow.

Table 2 The selected verbs and the type of mass object they combine with

Verb	Aspect	Prefix	Suffix	Object
dodaty 'add'	PERF	*do-*		abstract or concrete
dodavaty 'add'	IMPF	do-	-va-	abstract or concrete
zvaryty 'cook'	PERF	z-		concrete
varyty 'cook'	IMPF			concrete
nabuty 'gain'	PERF	na-		abstract
nabuvaty 'gain'	IMPF	na-	-va-	abstract
navaryty 'cook (any amount)'	PERF	na-		concrete
navarjuvaty 'cook (any amount)'	IMPF	na-	-juva-	concrete
dovaryty 'cook (till done)'	PERF	do-		concrete
dovarjuvaty 'cook (till done)'	IMPF	do-	-juva-	concrete
pobažaty 'wish'	PERF	po-		abstract or concrete
bažaty 'wish'	IMPF			abstract or concrete

In this way, the corpus search was set up like an experiment to examine the effect of various aspectual properties of the verbs and the semantic properties of the mass nouns on the object case.

14 This pair was added for additional information on intensional verbs. Even if the pair is not recorded as an aspectual pair in the dictionary, we regard it as a pair based on the description of *po-* in Vyxovanec' and Horodens'ka (2004, 228). The discussion section will include a small-scale study on *bojatysja* 'be afraid of, fear' with the objects 'dog' and 'darkness'.

4.1.2 The Selection of Nouns for the Analysis

It has been established in literature that partitive genitive objects emerge with mass nouns. Within the semantic group of mass nouns, we searched for nouns that were lexical-semantically and pragmatically plausible object complements for the chosen verbs. The choice is based on Pljušč (2005) and Ševčuk (2010), who proposed classes of nouns prone to appear with genitive partitive, such as metals, chemicals, liquids, food, medicines, plants, and materials. The concrete mass nouns 'sugar', 'water', and 'borscht' were selected.

In the selection process, as with verbs, both semantic and morphological factors played a role. All count nouns were deselected, either a) concrete (or predominantly concrete, 'table', 'pillow'), b) ambiguously concrete or abstract, which would be dependent on their context or individual interpretation, e.g., 'school' as a building or institution, or c) abstract, such as 'number' or 'idea'. Nouns with frequent metaphorical extensions and mass/concrete metonymies (e.g., democracy: the western democracies) were excluded.

We checked if abstract mass nouns deviate from concrete mass nouns in their case alternation behaviour. Thus, we hypothesised that there is variation among mass nouns on the concrete-abstract axis. While we selected *voda* 'water', *cukor* 'sugar' and *boršč* 'borscht' as Ukrainian examples of concrete mass noun objects, we complemented them with *bad'orist'* 'vigour', *optymizm* 'optimism', *vpevnenist'* 'confidence' and *dosvid* 'experience' for abstract mass nouns. In the MRC Psycholinguistic Database,[15] the selected concrete nouns belong to the most concrete segment (600-700) on the concreteness rating scale that ranges from 100 to 700. *Borscht* is not included in the database that contains only words in English; for *boršč* we checked the rating scale for the hypernym *soup*. The abstract mass nouns 'optimism', 'vigour', 'experience', and 'confidence' are in the suitable range of rating in the database.[16] The Ukrainian words or concepts of optimism, experience, and confidence had clear English translational counterparts, English words, in the database. The noun *bad'orist'* 'vigour' does not have a precise translation that would be frequent enough to appear in the rating. Therefore, we considered its synonyms, hypernyms, and words perceived as similar in abstractness as proof of its place among the most abstract group: these English

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15 MRC Psycholinguistic Database: `https://websites.psychology.uwa.edu.au/school/MRCDatabase/uwa_mrc.htm`.

16 The least concrete and most abstract segment contains mainly function words (but not only, e.g., 'from', 'of', 'so', 'for', 'therefore', 'were', 'impossible'), so our choice of abstract nouns belongs to the second most abstract segment of the MRC abstractness/concreteness scale, that of 200-300.

words were 'attitude', 'behaviour', 'distraction', 'enthusiasm', 'excitement', 'impulse', and 'temptation'.

Morphologically, nouns with clearly distinguishable genitive and accusative masculine and feminine forms were selected.[17] Table 3 presents the accusative and genitive case forms of the mass nouns of the sample.

Table 3   Accusative and genitive case forms of the mass nouns of the sample

Noun, Translation	Semantic class	Gender m/f	Genitive	Accusative
cukor 'sugar'	concrete	M	*cukr-u*	*cukor*
voda 'water'	concrete	F	*vod-y*	*vod-u*
boršč 'borscht'	concrete	M	*boršč-u*	*boršč*
optymizm 'optimism'	abstract	M	*optymizm-u*	*optymizm*
bad'orist' 'vigour'	abstract	F	*bad'orost-i*	*bad'orist'*
vpevnenist' 'confidence'	abstract	F	*vpevnenost-i*	*vpevnenist'*
dosvid 'experience'	abstract	M	*dosvid-u*	*dosvid*

In order to obtain a balanced set of features to analyse, we searched for additional verb-object combinations to complement the verb sets *dodaty* PERF 'add' and *varyty* IMPF 'cook', which were the most suitable for our study. The verbs are included in Table 2. Not all chosen suitable combinations, however, yielded abundant instances of the combinations for conducting comparisons of all possible features of verbs and objects. We have searched for *nabu(va)ty optymizm/bad'orist'* 'gain optimism/vigour', and *doda(va)ty dosvid* 'add experience', but we did not find any examples for the perfective and imperfective combinations with these objects. We note it here and exclude them from the tables, figures, and most of the later discussions.

4.2   Corpus Search

This Section is included for those readers who are interested in replicating the study to validate the results, or for those readers who wish to complement the dataset with comparable data collected with an identical methodology, for Ukrainian or other languages.

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17   One may wonder why plurals, although semantically similar to mass nouns in cumulativity, were excluded. Partly, they were excluded on morphological grounds (singular and plural may have ambiguous forms in accusative or genitive), partly on semantic grounds. Plurals are more difficult to control for animacy, which is a well-known factor in the languages of the world as well as in Ukrainian with respect to mapping to case (cf. Neidle 1988).

We searched with the Word Sketch function for the verb-object collocations and entered them in an Excel table. We added all examples if the number of occurrences was less than 500 and coded them for their genitive or accusative objects manually. When there were more occurrences than 500, we used the function of 'Shuffle Sample' to create a representative sub-selection of 500 occurrences with Sketch Engine.[18] In all cases, we deselected examples that were instances of doublets (identical sentences with identical context but found on different websites), results of machine translation, negation and quantifiers as attested factors influencing or determining case in Ukrainian. Also, all measure genitives ('a pot of borscht') were removed, as they are similar to quantifiers. We also removed other instances where the target noun was actually a complement within another phrase (e.g., in a complex noun phrase) and not the object of the verb. We also removed passives. In some cases, nominal apposition with a superordinate term appeared, such as 'I cooked soup – borscht', and we removed such cases. We also removed sentences that turned out to be misclassifications of verb-object combinations, such instances with inversion where 'water' was a subject, not an object, and used in the nominative case. We composed a table where we counted the genitives and accusatives with perfective versus imperfective verbs. The result table **[tab. 4]** and the corresponding figures **[figs 1-9, 11]** are presented in Section 5. Additional combinations of features are found to support the discussion in Section 6 **[figs 12-13]**.

The number of sentences with accusative and genitive objects that will be presented in the results section is typically based on the shuffle function sampling, which can be considered representative for testing the given combination. However, as a result of the manual exclusion of the unsuitable sentences (negation, quantifiers, etc), the number of manually analysed sentences is mostly less than 500.

The following passages detail the reasons for exclusion, with the corresponding lists of the number of items removed from the original Sketch Engine search results. Note that the examples with D refer to the examples on the online data sheet.

From the search on the verb *dodaty/dodavaty* 'add' and the object *voda* 'water', we excluded the following items: 4 sentences with

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18   A similar method using shuffle function for a sampling 500 sentences was applied by Vaiss (2022), who used it to establish that the Russian and Ukrainian verbs for 'watch, look' have a significantly lower degree of transitivity compared to their equivalents in Estonian. It did not matter for the number of hits in the present study whether we started the Word Sketch from one or another direction: it was a matter of convenience. For the words *bad'orist'* 'vigour' with a perfective verb, we used the Word Sketch starting with the noun. For the noun *voda* 'water', we started the search via the verbs (PERF and IMPF). With the noun *bad'orist'* 'vigour', in combination with an imperfective verb, we used Word Sketch starting with the verb.

'water' as a subject, 2 sentences machine translated (Ukrainian text not produced by humans), 9 negative sentences (see examples 9 = (4D), 10 = (12D) and 11 = (13D) on the data sheet), 231 sentences with quantifiers (see examples 12 = (7D) and 13 = (17D) on the data sheet), 2 sentences with their objects in the plural, 21 sentences with 'water' misclassified as an object (being in fact a different type of complement).

For those readers who are interested in replicating the study, here we discuss some instances of excluded examples that represent types that were abundant in the results of our corpus search.

Example (7) = (3D) presents the perfective verb form *dodadut'* 'they add' and example (8) = (16D) presents the imperfective verb form *dodaje* 'it adds' with the dative case *vodi*. This mistake was regular in the type of search we conducted because of the three-place predicate nature of the verb. The object in this case is present, *aromat* 'aroma', but we excluded all sentences that had a misclassified object.

(7) = (3D)

Вони	*додадуть*	*воді*	*аромат*	*і*	*зроблять*
Vony	*dodadut'*	*vodi*	*aromat*	*i*	*zrobljat'*
they	PREF.add.3PL.PERF	water.DAT	aroma	and	make
шкіру	*більш*	*м'якою.*			
škiru	*bil'š*	*m"jakoju.*			
skin	more	soft			

'They will add aroma to the water and make the skin softer.'

(8) = (16D)

Мідь	*додає*	*воді*	*неприємний*	*терпкий*
Mid'	*dodaje*	*vodi*	*nepryjemnyj*	*terpkyj*
copper	PREF.gives.IMPF	water.DAT	unpleasant	astringent
присмак	*у*	*низьких*	*концентраціях.*	
prysmak	*u*	*nyz'kyx*	*koncentracijax*	
taste	in	low	concentrations	

'Copper gives water an unpleasant astringent taste in low concentrations.'

In examples (9) and (10), a verb form of perfective *dodaty* 'add' and imperfective *dodavaty* 'add' respectively are combined with the genitive object in negation.

(9) = (4D)

Не	*перемішуйте.*	*I,*	*головне,*	*не*	*додайте*
Ne	*peremišujte.*	*I,*	*holovne,*	*ne*	*dodajte*
NEG	PREF.stir.2PL.IMPF	and	most.importantly	NEG	PREF.add.PERF

води!
vody!
water.GEN

'Do not stir. And, most importantly, do not add water!'

(10) = (12D)

Намагайтеся	*не*	*додавати*	*води,*	*якщо*	*бачите,*
Namahajtesja	*ne*	*dodavaty*	*vody,*	*jakščo*	*bačyte,*
try	not	PREF.add.IMPF	water.GEN	if	see.2PL

що	*гіпс*	*застигає.*
ščo	*hips*	*zastyhaje.*
that	plaster	hardens

'Try not to add water if you see the plaster harden.'

In example (11), we present an imperfective verb form of *dodavaty* 'add' that is combined with the accusative object in negation. All together there were 130 examples with the accusative objects in negative sentences, which in itself is an interesting finding to report; here, it illustrates a highly frequent type of data that we have manually excluded.

(11) = (13D)

Наприклад,	*не*	*додавайте*	*воду*	*у*	*туш*
Napryklad	*ne*	*dodavajte*	*vodu*	*u*	*tuš*
for.example	neg	PREF.add.IMPF	water.ACC	to	mascara
або	*ацетон*	*у*	*лак*	*для*	*нігтів.*
abo	*aceton*	*u*	*lak*	*dlja*	*nihtiv.*
or	acetone	to	polish	for	nails

'For example, don't add water to mascara or acetone to nail polish.'

In examples (12) and (13), the perfective verb form of *dodaty* 'add' and its aspectual partner, the imperfective verb form of *dodavaty* 'add' respectively occur together with a quantifier after which follows the genitive object.

(12) = (7D)

A	*що,*	*коли*	*до*	*вентилятора*	*приєднати*	*холодильник,*
A	*ščo,*	*koly*	*do*	*ventyljatora*	*pryjednaty*	*xolodyl'nyk,*
and	what	if	to	fan	connect	refrigerator
та	*ще*	*й*	*додати*	*трішки*	*води?*	
ta	*šče*	*j*	*dodaty*	*triška*	*vody?*	
and	also		PREF.add.PERF	a.little	water.GEN	

'And what if you connect a refrigerator to the fan, and also add a little water?'

(13) = (17D)

Аби	*знизити*	*витрати,*	*недобросовісні*	*виробники*
Aby	*znyzyty*	*vytraty,*	*nedobrosovisni*	*vyrobnyky*
to	reduce	costs	unscrupulous	producers
додають	*більше*	*води*	*або*	*використовують*
dodajut'	*bil'še*	*vody*	*abo*	*vykorystovujut'*
PREF.add.IMPF	more	water.GEN	or	use
сировину	*поганої*	*якості.*		
syrovynu	*pohanoji*	*jakosti.*		
raw.material	poor	quality		

'To reduce costs, unscrupulous producers add more water or use poor quality raw materials.'

From the search on the verb *dodaty/dodavaty* 'add' and the abstract object *bad'orist'* 'vigour', we excluded the following items: 1 sentence machine translated, clearly not worded by a human, 1 sentence that is doubled, 8 negative sentences.

From the search on the verb *zvaryty/varyty* 'cook' and the abstract object *boršč* 'borscht', we excluded the following items: 6 sentences with measure genitives, 1 sentence machine translated, 2 sentences with passive, 42 negative sentences, 2 sentences with doubled nouns, 68 sentences with objects in plural, 2 sentences that are doubled.

From the search on the verb *dodaty/dodavaty* with the noun *cukor* 'sugar', 2 sentences were excluded in the results of imperfective and 2 from the perfective sentences. In both cases, there was one malformed word and one quantifier in the phrases.

From the search on the verb *dodaty/dodavaty* with the noun *optymizm* 'optimism', negative sentences were excluded: 250 sentences were excluded in the results of imperfective and 91 from the perfective sentences.

From the search on the verb *dodaty/dodavaty* 'add' and the object *vpevnenist'* 'confidence', we excluded the following items: 4 sentences with 'confidence' as a subject, 68 negative sentences, 15 sentences with quantifiers, 1 sentence with another object than confidence and 1 sentence because it was identical to another sentence in the excel file.

From the search on the verb *nabuty/nabuvaty* 'gain' and the object *dosvid* 'experience', we excluded the following items: 11 sentences with 'experience' as a subject, 2 sentences with object in instrumental case, 4 sentences machine translated, 20 negative sentences, 9 sentences with quantifiers, 2 sentences with their objects in the plural, 11 sentences in passive construction.

From the search on the verb *nabuty/nabuvaty* 'gain' and the object *vpevnenist'* 'confidence', we excluded the following items: 3 negative sentences and 1 sentence that occurred twice.

From the search on the verb *navaryty/navarjuvaty* 'cook' and the object *boršč* 'borscht' we excluded the following items: 2 sentences with their objects in the plural.

From the search on the verb *dovaryty/dovarjuvaty* 'cook' and the object *boršč* 'borscht' we excluded the following item: 1 negative sentence.

From the search on the verb *pobažaty/bažaty* 'wish' and the object *optymizm* 'optimism' we excluded the following items: 3 sentences with quantifiers.

5   Results

The visualisations in Figures 1-4 present the data with the concrete mass nouns *boršč* 'borscht', *voda* 'water' and *cukor* 'sugar', and Figures 5-9 present the data with abstract mass nouns as *bad'orist'* 'vigour' or *optymizm* 'optimism' etc. Figures 10, 11 are additional, on the intensional verb *pobažaty/bažaty* 'wish' and the object *optymizm* 'optimism', and a summary figure, Figure 11, visualising Figures 1-9. The summary of the results can be found in Table 4. Note that there is an open access data sheet that contains proof of all combinations described in the ensuing Figures. The numbers with 'D', provided additionally next to the example numbers, refer to example numbering on the online data sheet at osf.io/qcnx8.
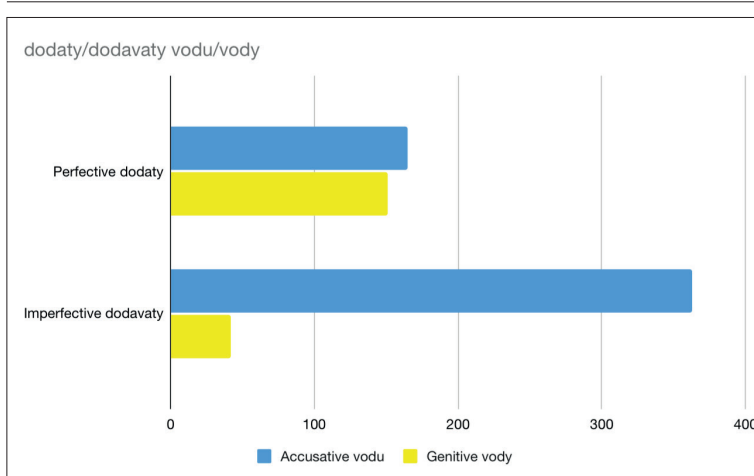
Figure 1   The verb *dodaty*/*dodavaty* 'add' and the object *voda* 'water'

5.1   Concrete Mass Nouns

The Figures 1-4 present the data with concrete mass nouns.

We see proportions of usage **[fig. 1]**. The object *voda* 'water' when combined with an imperfective verb *dodavaty* 'add' is used in 42 cases in the genitive case and in 363 cases in the accusative case. At the same time, with the perfective verb, the object *voda* 'water' is in 165 cases in the accusative case and in 151 cases in the genitive case. It is thus clear that the accusative case appears more with imperfective than perfective verbs and in the case of perfective verbs the number of accusative and genitive objects is almost equal.[19] In examples (14) and (15), we present an example from the ukTenTen corpus of the perfective verb *dodaty vody* and *vodu* 'add water'. Example (14) illustrates the perfective *dodaty* 'add' and the accusative *vodu* 'water'.

(14) = (1D)

Яйця	*розбити*	*в*	*миску,*	*посолити,*
Jajcja	*rozbyty*	*v*	*mysku,*	*posolyty,*
eggs	crack	in	bowl	add.salt
додати	*воду*	*i*	*збити.*	
dodaty	*vodu*	*i*	*zbyty.*	
PREF.add.PERF	water.ACC	and	beat	

'Crack the eggs into a bowl, add salt, add water and beat.'

---

19   The perfective variant with negation and an accusative object is absent with the combination 'add water', that is, not attested in our data.

Example (15) illustrates the perfective *dodaty* 'add' and the genitive *vody* 'water'.

(15) = (2D)

До	цієї	суміші	можна	додати
Do	*cijeji*	*sumiši*	*možna*	*dodaty*
to	this	mixture	is.possible	PREF.add.PERF

води	в	пропорції	1:1.
vody	*v*	*proporciji*	*1:1.*
water.GEN	in	proportion	1:1

'Water can be added to this mixture in a proportion of 1:1.'

Example (16) illustrates the imperfective *dodavaty* 'add' and the genitive *vody* 'water'.

(16) = (10D)

Все	це	змішують	і	додають	води.
Vse	*ce*	*zmišujut'*	*i*	*dodajut'*	*vody.*
All	this	PREF.mix.3PL.IMPF	and	PREF.add.3PL.IMPF	water.GEN

'All this is mixed and water is added.'/'They mix all this and add water.'

Example (17) illustrates the imperfective *dodavaty* 'add' and the accusative *vodu* 'water'.

(17) = (11D)

З	гречаного	борошна,	в	яке	додаємо
Z	*hrečanoho*	*borošna,*	*v*	*jake*	*dodajemo*
from	buckwheat	flour	to	which	PREF.add.1PL.IMPF

воду	і	яйце,	робимо	густе	тісто.
vodu	*i*	*jajce,*	*robymo*	*huste*	*tisto.*
water.ACC	and	egg	make.1PL	thick	dough

'We make a thick dough from buckwheat flour, to which we add water and an egg.'

We see proportions of usage in Figure 2: the object *cukor* 'sugar', when combined with an imperfective verb *dodavaty* 'add', is used in 6 cases in the genitive case and in 449 cases in the accusative case. At the same time, with the perfective verb, the object *cukor* 'sugar' is in 50 cases in the genitive case and in 444 cases in the accusative case. It is thus clear that the genitive case appears more with the perfective than with the imperfective verb, and the number of accusative uses is almost equal for both the perfective and the imperfective verb [fig. 2].
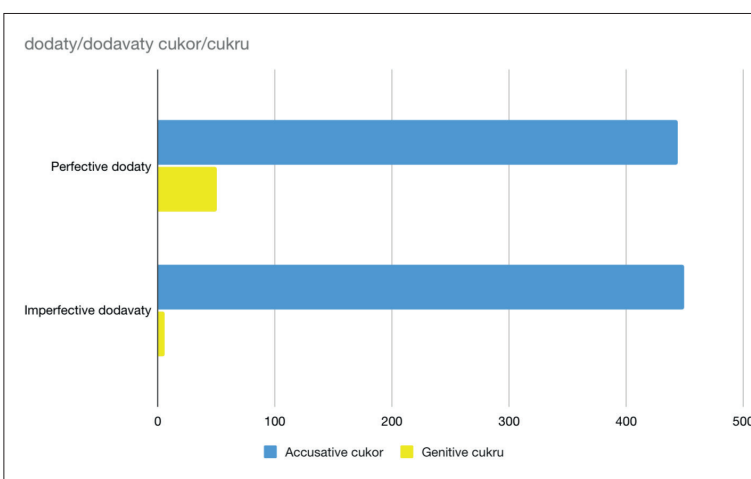
Figure 2 The verb *dodaty/dodavaty* 'add' and the object *cukor* 'sugar'
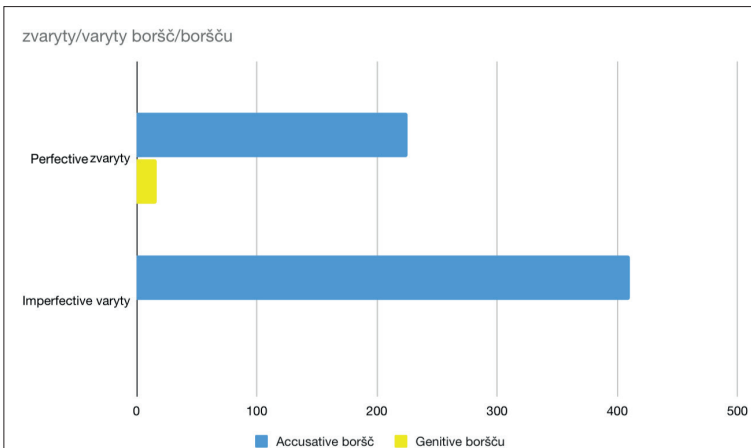

Figure 3 The verb *zvaryty/varyty* 'cook' and the object *boršč* 'borscht'

We see proportions of usage in Figure 3: the object *boršč* 'borscht', when combined with an imperfective verb *varyty* 'cook', has no cases (N=0) where the object is used in the genitive case, while it is used in 410 cases in the accusative case. For the perfective verb, the object *boršč* 'borscht' is used in 225 cases in accusative case and in 17 cases in genitive case. The accusative case is used more frequently for both imperfective and perfective verbs, while the genitive case does not appear at all with imperfective verbs (N=0) **[fig. 3]**.
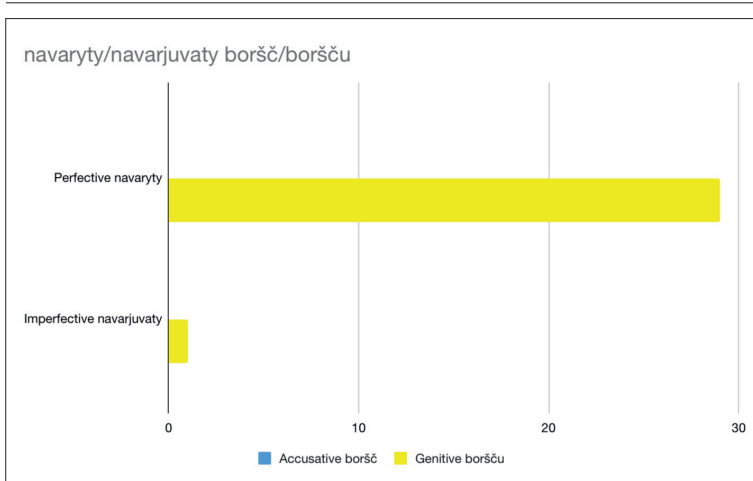
navaryty/navarjuvaty boršč/borščи

Figure 4   The verb *navaryty/navarjuvaty* 'cook' and the object *boršč* 'borscht'

Example (18) illustrates an instance of *boršč* 'borscht' in the accusative case and the imperfective verb *varyty* 'cook'.

(18) = (30D)

Як	варить	борщ	твоя	мама?
Jak	*varyt'*	*boršč*	*tvoja*	*mama?*
how	cook.IMPF	borscht.ACC	your	mother

'How does your mother cook borscht?'

Example (19) illustrates an instance of *boršč* 'borscht' in the accusative case with the perfective verb *zvaryty* 'cook'.

(19) = (31D)

З	нею	зварити	борщ	можуть	навіть
Z	*neju*	*zvaryty*	*boršč*	*možut'*	*navit'*
with	it	PREF.COOK.PERF	borscht.ACC	can	even
маленькі	діти.				
malen'ki	*dity.*				
little	children.				

'Even little children can cook borscht with it.'

Example (20) illustrates an instance of *boršču* 'borscht' in the genitive case with the perfective verb *zvaryty* 'cook'.

(20) = (32D)

Цього	*дня*	*годиться*	*зварити*	*борщу*	*з півнем.*
C'oho	*dnja*	*hodyt'sja*	*zvaryty*	*boršču*	*z pivnem.*
on.this	day	it.is.good	PREF.cook.PERF	borscht.GEN	with rooster

'On this day, it is good to cook borscht with a rooster.'

Example (21) illustrates grammatically incorrect sentences, which are marked with an asterisk. In (21a), there is a sentence with *boršču* 'borscht' in the genitive case with the imperfective verb *varyty* 'cook', which we have constructed. In (21b), we have modified the grammatically correct (18), which has an accusative, replacing the object case with the genitive. Native speaker's judgment about (21b) is also that it is incorrect.

(21) = (33D)

a.

*Вона	*варила*	*борщу*	*на кожне свято.*
Vona	*varyla*	*boršču*	*na kožne svjato.*
she	cooked.IMPF	borscht.GEN	for every holiday

'She cooked borscht for every holiday.'

b.

*Як	*варить*	*борщу*	*твоя*	*мама?*
Jak	*varyt'*	*boršču*	*tvoja*	*mama?*
how	cook.IMPF	borscht.GEN	your	mother

'How does your mother cook borscht?'

We see in Figure 4 that the object *boršč* 'borscht', when combined with the imperfective verb *navarjuvaty* 'cook', is used just once (N=1) in the genitive case. The website of the Ukrainian dictionary[20] gives the following equivalent for the cooking-related sense of this version of the verb: 'prepare any amount of food by cooking' that suits the combination with the object *boršč* 'borscht'. Simultaneously, with the perfective verb, the concrete mass noun *boršč* is in 29 cases in the genitive case. The imperfective and the perfective verbs are not used with the accusative object at all (N=0) **[fig. 4]**.

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20 https://sum.in.ua/.

In (22), we see *navarjuvaty boršču* 'cook an amount of borscht': an imperfective verb with the genitive object.

(22) = (24D)

Я	*наварювала*	*борщу,*	*і*	*цей*	*борщ*
Ja	*navarjuvala*	*boršču,*	*i*	*cej*	*boršč*
I	PREF.cooked.IMPF	borscht.GEN	and	this	borscht
за	*один*	*день*	*з'їдали –*	*було*	*кому.*
za	*odyn*	*den'*	*z"jidaly –*	*bulo*	*komu.*
in	one	day	eat.3PL	was	someone.

'I cooked borscht, and this borscht was eaten in one day – there was someone (to do it).'

Example (23) illustrates the perfective *navaryty* 'cook' and the genitive *boršču* 'borscht'.

(23) = (29D)

Приведи	*Алю,*	*я*	*наварила*	*борщу –*
Pryvedy	*Alju,*	*ja*	*navaryla*	*boršču –*
bring	Alya,	i	PREF.made.PERF	borscht.GEN
сказала	*Каті*	*в*	*наступний*	*раз.*
skazala	*Kati*	*v*	*nastupnyj*	*raz.*
told.3.SG	Katya	in	next	time

'Bring Alya, I have made (a certain amount of – LCh) borscht - she answered Katya.'

Perfective verbs with genitive objects are illustrated in (24) and (25), *navaryty boršču* 'cook a certain amount of borscht'. Note that there is a parallelism between the two actions that are juxtaposed in (24). In both examples, the verbs are prefixed with *na-*.

(24) = (27D)

Наварила	*борщу,*	*насипала*	*в*	*тарілку.*
Navaryla	*boršču,*	*nasypala*	*v*	*tarilku.*
PREF.cooked.PERF	borscht.GEN	PREF.poured.PERF	into	plate

'(I/you/she) has cooked (a certain amount) borscht and has poured it into a plate.'

Note that, again, there is a parallelism in the prefix in the two actions that are juxtaposed in (25).

(25) = (28D)

Бабуся	*наварила*	*борщу,*	*наліпила*	*вареників.*
Babusja	*navaryla*	*boršču,*	*nalipyla*	*varenykiv.*
grandma	PREF.cook.PERF	borscht.GEN	PREF.made.PERF	dumplings.GEN

'Grandma has cooked borscht (a certain amount), has made dumplings (a certain amount).'

In the series of 'cook' with the prefix *do-*, we found 6 imperfective verbs, which were the only sentences in the corpus, all of which appeared with an accusative object only. Examples (26) and (27) illustrate the imperfective *dovarjuvaty* 'cook so that it is ready' and the accusative *boršč* 'borscht'. Note that both occurrences of imperfective forms are combined with a motion verb: the motion verbs of running and going.

(26) = (25D)

У	*цій*	*метушні*	*жінка*	*забула*	*про*	*всі*
U	*cij*	*metušni*	*žinka*	*zabula*	*pro*	*vsi*
in	this	commotion	woman	forgot	about	all
образи	*і*	*швидко*	*побігла*	*доварювати*	*борщ.*	
obrazy	*i*	*švydko*	*pobihla*	*dovarjuvaty*	*boršč.*	
insults	and	quickly	ran	PREF.cook.IMPF	borscht.ACC	

'In this commotion, the woman forgot about all the insults and quickly ran to finish cooking borscht.'

(27) = (26D)

Тільки	*не*	*здумайте*	*йти*	*доварювати*	*борщ*
Til'ky	*ne*	*zdumajte*	*jty*	*dovarjuvaty*	*boršč*
just	neg	think	go	PREF.cook.IMPF	borscht.ACC
або	*домивати*	*підлоги!*			
abo	*domyvaty*	*pidlohy!*			
or	PREF.clean.IMPF	floors			

'Don't even think of going to finish cooking borscht or to finish cleaning the floors!'

dodaty/dodavaty bad'orist'/bad'orosti

Perfective dodaty

Imperfective dodavaty

0   50   100   150

■ Accusative bad'orist'   ■ Genitive bad'orosti
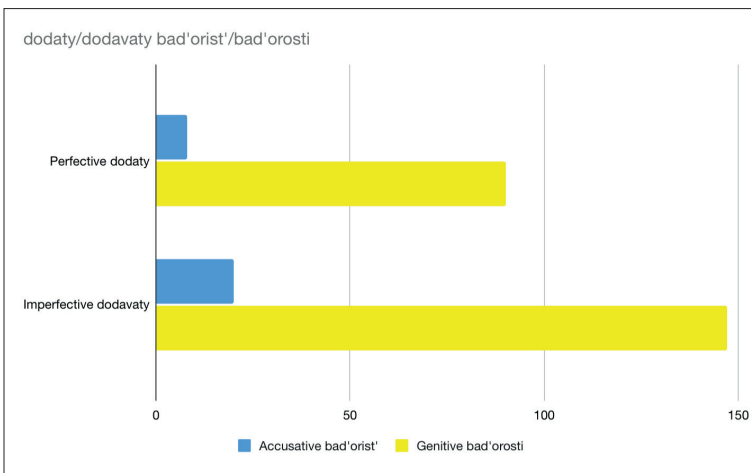
5.2   Abstract Mass Nouns

Figures 5-9 present the data with abstract mass nouns.

We see the proportions in Figure 5: the object *bad'orist'* 'vigour', when combined with the imperfective verb *dodavaty* 'add', is used in 147 cases in the genitive case and in 20 cases in the accusative case. At the same time, with the perfective verb, the object *bad'orist'* 'vigour' is used in 8 cases in the accusative case and in 90 cases in the genitive case. It is thus clear that the genitive case appears more frequently with both the perfective and imperfective verb *dodaty/dodavaty* 'add' **[fig. 5]**.

We see the proportions in Figure 6: the perfective verb *dodaty* 'add' appears 209 times with the object *optymizm* 'optimism' in the genitive case and just once in the accusative case. The imperfective verb *dodavaty* 'add' appears 250 times with the object *optymizm* 'optimism' in the genitive case and once in the accusative case. Thus, the object *optymizm* 'optimism' is very rare in the accusative case with the verbs *dodaty/dodavaty* 'add'.
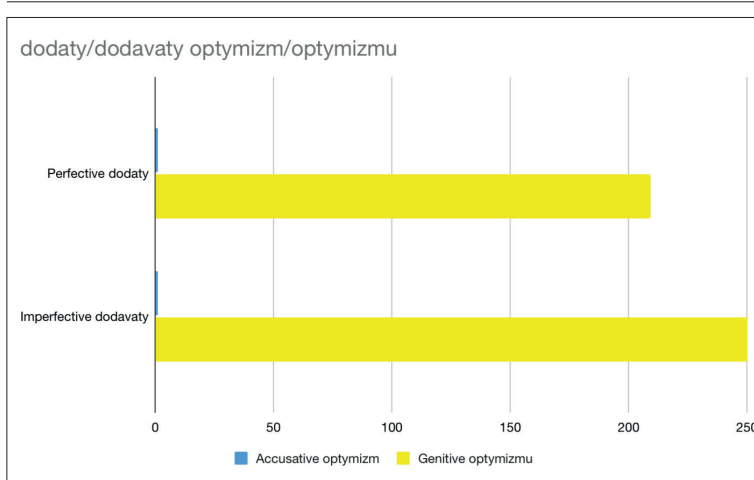
Figure 6 The verb *dodaty/dodavaty* 'add' and the object *optymizm* 'optimism'

Example (28) illustrates the perfective *dodaty* 'add' and the genitive *optymizmu* 'optimism' **[fig. 6]**.

(28) = (20D)

Сумно?	*Безнадійно?*	*Але*	*ж*	*сказав-бо*
Sumno?	*Beznadijno?*	*Ale*	*ž*	*skazav-bo*
sadly	hopelessly	but	PRT	said
апостол	*Павло*	*свої*	*парадоксальні*	*слова,*
apostol	*Pavlo*	*svoji*	*paradoksal'ni*	*slova,*
apostle	Paul	his	paradoxical	words
що	*не*	*одному*	*додали*	*оптимізму:*
ščo	*ne*	*odnomu*	*dodaly*	*optymizmu:*
which	not	one	PREF.added.PERF	optimism.GEN
"А	*де*	*збільшився*	*гріх,*	*там*
"A	*de*	*zbil'šyvsja*	*hrix,*	*tam*
and	where	increased	sin	there
зарясніла	*благодать"*			
zarjasnila	*blahodat'"*			
abounded	grace			

'Sad? Hopeless? But the apostle Paul said his paradoxical words, which added optimism to more than one person: "But where sin increased, grace increased all the more".'
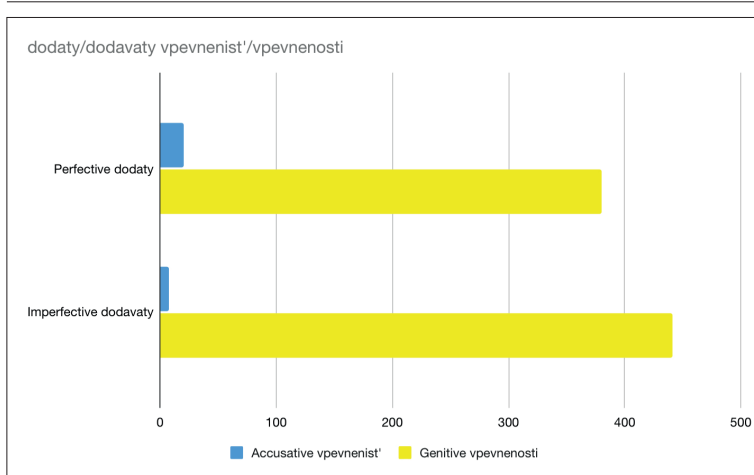
Example (29) illustrates the imperfective *dodavaty* 'add' and the accusative *optymizm* 'optimism'.

(29) = (21D)

Нехай	*поряд*	*із*	*зміцненням*	*нашої*		*держави*
Nexaj	*porjad*	*iz*	*zmicnennjam*	*našoji*		*deržavy*
let	along	with	strengthening	our		state
змінюється	*на*	*краще*	*наше*	*з*	*вами*	
zminjujet'sja	*na*	*krašče*	*naše*	*z*	*vamy*	
change	for	better	our	with	you	
життя,	*а*	*загартовані*	*сила*	*і*	*воля*	
žyttja,	*a*	*zahartovani*	*syla*	*i*	*volja*	
life	and	hardened	strength	and	will	
додають	*оптимізм*	*у*	*майбутньому!*			
dodajut'	*optymizm*	*u*	*majbutn'omu!*			
PREF.add.IMPF	optimism.ACC	in	future			

'Along with the strengthening of our state, may our life with you change for the better, and hardened strength and will add optimism in the future!'

We see in Figure 7 that in a positive sentence the perfective verb *dodaty* 'add' appears 380 times with the object *vpevnenist'* 'confidence' in the genitive case and 20 times in the accusative case. The imperfective verb *dodavaty* 'add' appears 441 times with the object *vpevnenist'* 'confidence' in the genitive case and 8 times in the accusative case. The abstract object in the genitive case is again more frequent here **[fig. 7]**.

We see the proportions of usage in Figure 8. The abstract noun *dosvid* 'experience', when combined with the imperfective verb
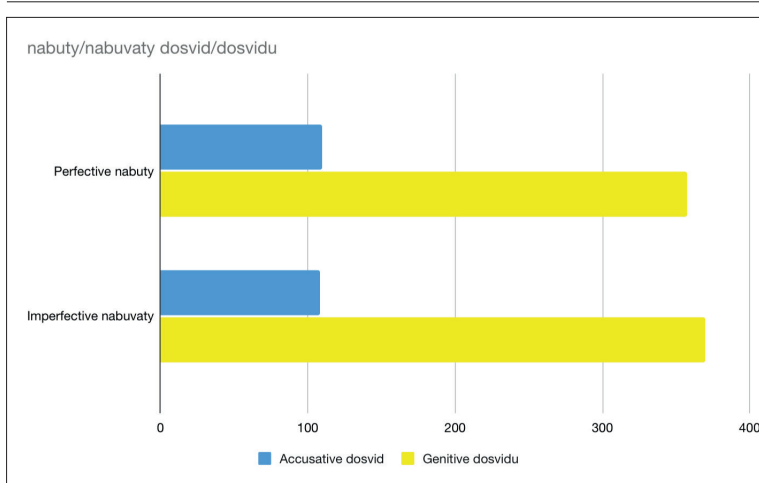
Figure 8   The verb *nabuty*/*nabuvaty* 'gain' and the object *dosvid* 'experience
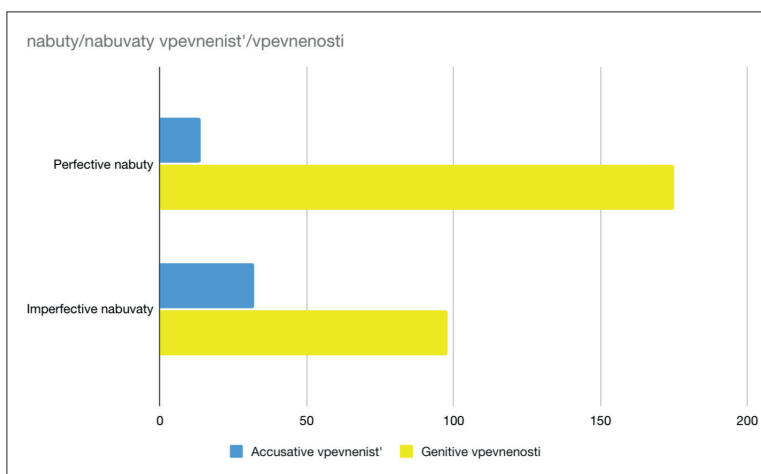

Figure 9   The verb *nabuty*/*nabuvaty* 'gain' and the object *vpevnenist'* 'confidence'

nabuvaty 'gain', is used in 370 cases in the genitive case and in 108 cases in the accusative case. At the same time, with the perfective verb, the abstract object *dosvid* 'experience' is used in 110 cases in the accusative case and in 357 cases in the genitive case **[fig. 8]**.

We see the proportions in Figure 9: the object *vpevnenist'* 'confidence' when combined with the imperfective verb *nabuvaty* 'gain' is used in 98 cases in the genitive case and in 32 cases in the accusative case. With the perfective verb, the abstract noun *vpevnenist'* is in 14 cases in the accusative and in 175 cases in the genitive **[fig. 9]**.

5.3 Intensional Verbs

This subsection presents the pattern of aspect and object case of an intensional verb pair, *pobažaty* PERF and *bažaty* IMPF *optymizm(u)* 'wish optimism' **[fig. 10]**.

We see in Figure 10 that the object *optymizm* 'optimism', when combined with the verb form *bažaty* IMPF, 'wish' is used in 10 cases in the genitive case. At the same time, with the prefixed verb form, *pobažaty* PERF 'wish', the abstract noun *optymizm* is found in 12 cases in the genitive case. The verb forms do not occur with the accusative object. Figure 11 serves as a visual aid.

In Table 4, we present a summary of all analysed aspectual pairs. Please note that in some cases, we have not found examples of the verb and the object in our sample. These cases of low frequency with no examples (N = 0) were excluded in Figure 11 but included in Table 4 **[fig. 11] [tab. 4]**.

Table 4   Summary of the results on the aspect of the verbs and the case and properties of the object nouns. An asterisk (*) marks items of low frequency

| Verb	Aspect	Prefix	object noun	nominal proper-ties	N and % of accusative objects	N and % of objects with genitive
dodaty 'add'	perfective	*do-*	*voda* 'water'	concrete	165 (52.21%)	151 (47.78%)
dodavaty 'add'	imperfective	do-	*voda* 'water'	concrete	363 (89.62%)	42 (10,37%)
dovaryty 'cook'*	perfective	do-	*boršč* 'borscht'	concrete	0	0
dovarjuvaty 'cook' *	imperfective	do-	*boršč* 'borscht'	concrete	6 (100%)	0(0%)
dodaty 'add'	perfective	do-	*cukor* 'sugar'	concrete	444 (89.87%)	50 (10.12%)
dodavaty 'add'	imperfective	do-	*cukor* 'sugar'	concrete	449 (98.68%)	6 (1.31%)
navaryty 'cook' *	perfective	na-	*boršč* 'borscht'	concrete	0	29 (100%)
*navarjuvaty** 'cook' *	imperfective	na-	*boršč* 'borscht'	concrete	0	1 (100%)
zvaryty 'cook'	perfective	z-	*boršč* 'borscht'	concrete	225 (92.97%)	17 (7.02%)
varyty 'cook'	imperfective	-	*boršč* 'borscht'	concrete	410 (100%)	0 (0%)
dodaty 'add'	perfective	do-	*vpevnenist'* 'confidence'	abstract	20 (5%)	380 (95%)
dodavaty 'add'	imperfective	do-	*vpevnenist'* 'confidence'	abstract	8 (1.78%)	441 (98.21%)
nabuty 'gain'	perfective	na-	*dosvid* 'experience'	abstract	110 (23.55%)	357 (76.44%)
nabuvaty 'gain'	imperfective	na-	*dosvid* 'experience'	abstract	108 (22.59%)	370 (77.4%)
dodaty 'add'	perfective	do-	*optymizm* 'optimism'	abstract	1 (0.47%)	209 (99.52%)
dodavaty 'add'	imperfective	do-	*optymizm* 'optimism'	abstract	1 (0.39%)	250 (99.6%)
dodaty 'add'	perfective	do-	*bad'orist'* 'vigour'	abstract	8 (8.16%)	90 (91.83%)
dodavaty 'add'	imperfective	do-	*bad'orist'* 'vigour'	abstract	20 (11.97%)	147 (83.02%)
nabuty 'gain'	perfective	na-	*vpevnenist'* 'confidence'	abstract	14 (7.4%)	175 (92.59%)
nabuvaty 'gain'	imperfective	na-	*vpevnenist'* 'confidence'	abstract	32 (24.61%)	98 (75.38%)
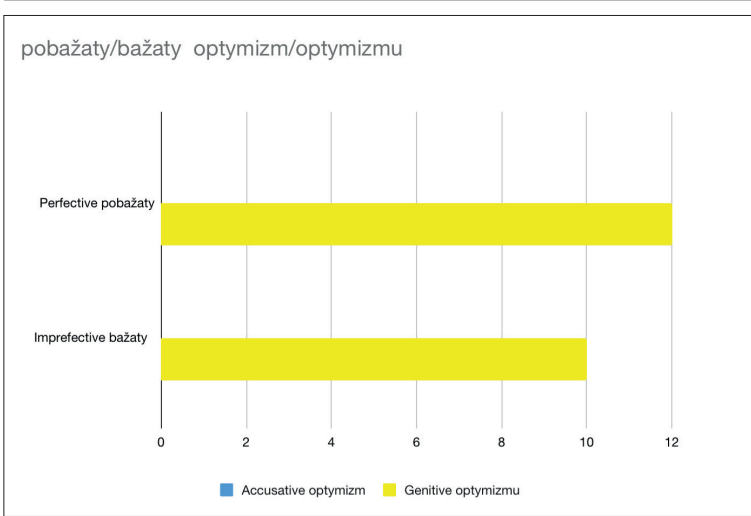
Figure 10 The verb *pobažaty*/*bažaty* 'wish' and the object *optymizm* 'optimism'
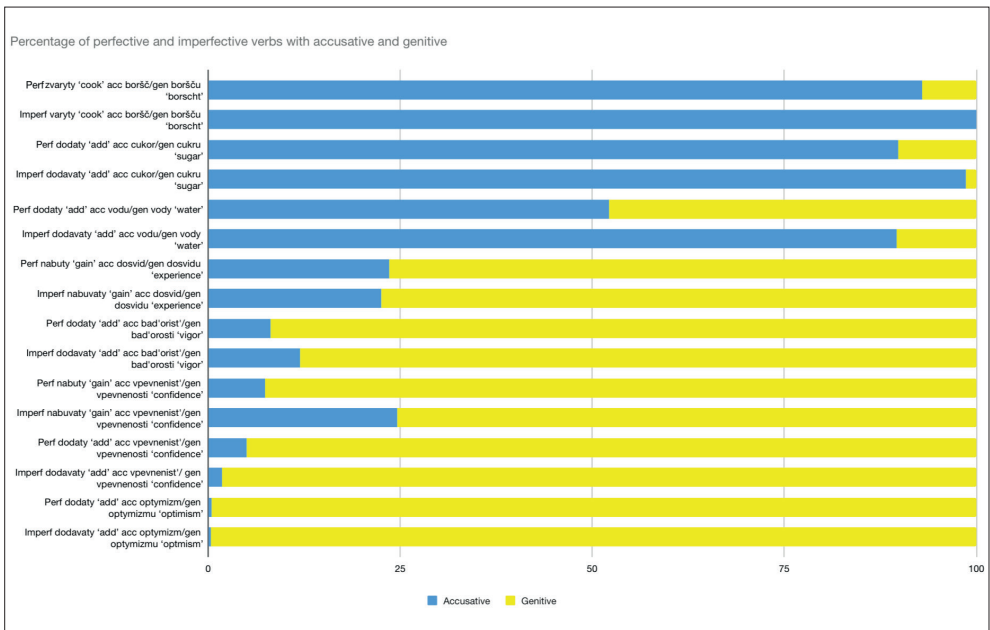
Figure 11 Summary of the usage of verbs with concrete and abstract mass nouns as objects in the accusative and the genitive case

6   Discussion

We have found that the verbs denoting 'add' allow us to compare the case alternation on the mass nouns, abstract and concrete. Additional combinations of verbs and nouns have been studied to supply more evidence. We have found differences between nouns that span across verb classes. For the discussion of the data, we performed an occasional smaller scale corpus search that we will discuss in the ensuing passages.

In the case of concrete mass nouns, imperfective verbs are less likely to appear with the genitive object than their usually prefixed counterpart, perfective verbs. The combination of the imperfective *varyty* 'cook' and *boršč* 'borscht' has only accusative objects in our sample, while the combination of the perfective *zvaryty* 'cook' and *boršč* 'borscht' has 7% of the genitive objects. However, *navaryty/navarjuvaty* 'cook (some certain amount)' has only genitive objects with *boršč* 'borscht', showing the significance of the partitivity feature of the prefix for the partitioning or portioning of the cumulative object of indeterminate quantity. In these verb forms, the prefixes do not perfectivise the partner in the grammatical aspectual verb pair.

The prefixes *do-* and *na-* with imperfective verbs and with the concrete object *boršč* (*dovaryty/dovarjuvaty* and *navaryty/navarjuvaty* 'cook') yield, however, few samples in the corpus and vary in their behaviour. The aspectual verb pair *navaryty/navarjuvaty* 'cook (any amount)' and *boršč* 'borscht', see examples (22) = (24D), (23) = (29D), (24) = (27D), (25) = (28D), have only 30 results, all examples are genitive and appear only with the imperfective verb partner.[21] Verb semantics clearly plays a role here, as a determining factor for the possibility of any object case variation. In the case of *dovaryty/dovarjuvaty* 'cook (until done)' (see examples (26) = (25D), (27) = (26D)) a genitive object is impossible as only the whole predefined object can be cooked until done. The object is portioned and quantised in the previous discourse if this prefix is applied: one can only finish something that has been started already. The verb with this prefix does not 'portion' the object further, even if *boršč* 'borscht' in itself denotes a mass noun with indefinite quantity. The aspectual verb pair *navaryty/navarjuvaty*, vice versa, favours a genitive object as it shows here that the amount of object is of a certain quantity that was not defined ('portioned') in its preceding context. The prefix *do-*, as opposed to the prefix *na-*, implies an earlier start for the cooking of the same borscht – the cooking has been started earlier and, at the point of speech, it is communicated that it will be

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[21]   Note that the examples with D refer to the examples on the online data sheet.

or it was cooked so that this particular amount of borscht is ready. On the contrary, with the prefix *na-*, a new portion is produced. The quantity of borscht remains the same with *do-*; thus, while quantitatively indeterminate, *boršč* 'borscht' is not being 'portioned', and thus not compatible with the partitive genitive interpretation and the genitive case-marking on the object.[22]

If the mass object is more frequent with the accusative than with the genitive, then the concreteness, aspect, and the presence of a prefix play a role. The verb *doda(va)ty* 'add' shows that the abstract mass nouns are predominantly in the genitive, and the concrete mass nouns are in the accusative. However, the individual mass abstract nouns displayed differences among each other and also in relation to their case behaviour in combination with the two partners of the aspectual pair. For instance, in *doda(va)ty vpevnenist' / optymizm(u)* 'add confidence/optimism' and *nabu(va)ty dosvid(u)* 'gain experience', the aspectual partners displayed only insignificant differences regarding object case marking. The imperfective partner *nabuvaty dosvid(u)* 'gain experience' even resulted in having a slightly larger share of genitive objects than the perfective one in the corpus. In this combination, the result is unexpected. We can conclude about abstract mass nouns that the grammatical aspect of the verb is largely insignificant for their object case. Figure 12 demonstrates the expected pattern, showing the share of partitive genitive defined as the combination of a genitive concrete mass noun object and a perfective verb.

Figures 12 and 13 contain the data of all examined verb pairs in our corpus [figs 12-13]. We can confirm based on our corpus study that concrete mass nouns give empirical evidence for the phenomenon referred to as the partitive genitive in Ukrainian. The pattern is as expected. Imperfective verbs have accusative objects, and perfective verbs are divided. The partitive genitive emerges with the perfective aspect and concrete mass objects. Figure 13 visualises the puzzle for abstract mass nouns.

The puzzle concerns Ukrainian abstract mass nouns, more specifically, the lack of straightforward evidence for the phenomenon referred to as the partitive genitive. Some instances of partitive genitive may well be among the examples, but the expected pattern we see for concrete mass nouns in Figure 12 is strikingly absent in Figure 13. Therefore, the accusative-genitive object case alternation

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22 Verbs of movement (to go to do something, as in *Vin pišov dovarjuvaty boršč* [IMPF, ACC] 'He went to cook borscht') are combined with the imperfective suffixed infinitive; here the verb is prefixed with *do-*. Combining a motion verb with an imperfective instead of a perfective verb is well attested in our corpus examples and might provide evidence for parallels between nominal and verbal domains (cf. also Zuchewicz 2020).
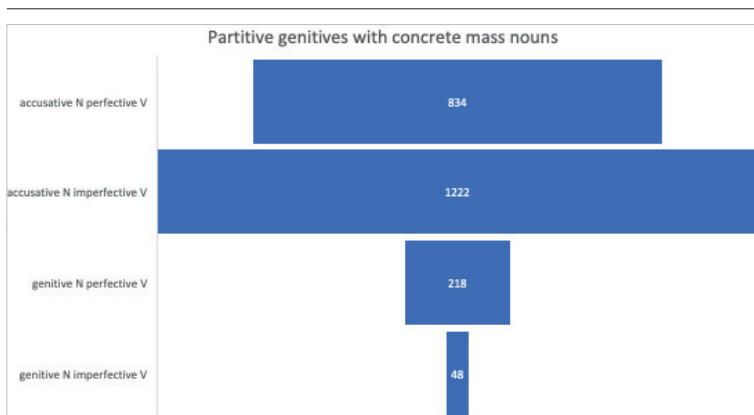
Figure 12 The share of partitive genitive and accusative with concrete mass nouns

cannot rely on a uniform nominal feature for determining the case of objects.[23]

The striking difference that underlies the variation between mass nouns, concrete versus abstract, calls for a cross-linguistic and diachronic investigation. As a result of our investigation, we found evidence for a split among mass nouns in the development of Romance and Germanic, and Uralic provides variation data for a synchronic split between concrete and abstract mass nouns.

Several earlier sources point out the abundance of specific partitive related phenomena in culinary literature (Carlier, Lamiroy 2014, 479; 485; Glaser 2024), since culinary texts contain abundant examples for concrete mass nouns. Carlier and Lamiroy (2014) discuss five stages of the partitive article and note that in stage III French, characterised by the hybrid status of the Romance partitive preposition and article, abstract nouns lack the hybrid partitive. In stage IV,

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23   The other avenue is to approach the unexpected variation from the pragmatic or cognitive properties of the mass nouns. Further research could explore the psycholinguistic work on concreteness and abstractness, as represented in the MRC Psycholinguistic Database. Note that our sample of mass nouns belongs to the two outer extremes on the concrete-abstract ratings scale of the database. It is, therefore, plausible that nouns placed mid-scale are also more heterogeneous in terms of partitive genitives. Other cognitive factors may also contribute to the peculiar features of partitive genitive in mass nouns. For instance, abstract and concrete nouns may diverge in how they are processed in their contexts (Schwanenflugel 1991), or there may be a variety of factors, each relevant for a different group of abstract nouns (Wiemer-Hastings 1998). These factors may prevent some abstract mass nouns from being perceived as mass by native speakers of Ukrainian. Also, the frequency of the nouns could play a role in processing and production.
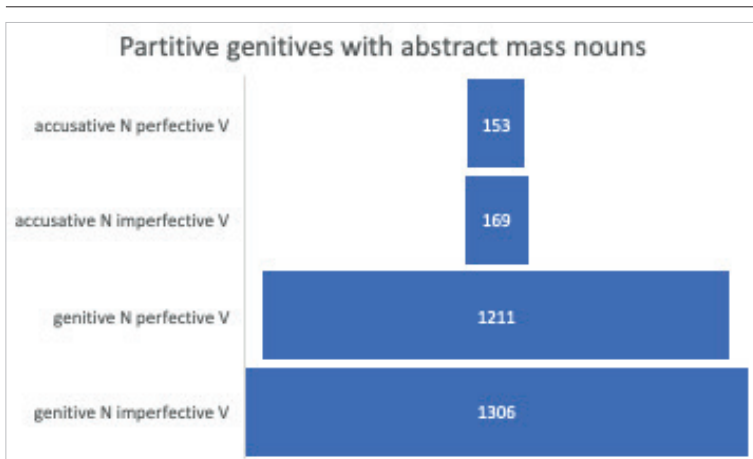
Partitive genitives with abstract mass nouns

accusative N perfective V	153
accusative N imperfective V	169
genitive N perfective V	1211
genitive N imperfective V	1306

Figure 13 Share of partitive genitive and accusative with abstract mass nouns

the partitive with abstract nouns is still uncommon (Carlier, Lamiroy 2014, 497). In Modern French, which corresponds to stage V, abstract nouns tend to lack the partitive article only if embedded under a PP. Otherwise, Carlier and Lamiroy (2014, 498) generalise that "[t]he partitive article is no longer necessarily linked to the notion of unspecified quantity and becomes common in combination with abstract nouns". Glaser (2024, 5) points out in her discussion of the sixteenth century cookbook of East Swabian that "[f]or abstract nouns, somewhat different conditions apply" with regard to their behaviour in terms of partitivity. She also points out that cookbooks in general are a special text type: they typically lack abstract nouns.

In diachronic studies of Romance and Germanic, the registers for researching variation within the domain of abstract nouns are restricted. In some Uralic languages, the cause of variation in the case marking within the group of mass nouns can be established across more registers. In Estonian, abstract and concrete mass nouns differ as far as partitive marking is concerned.[24] The examined Ukrainian

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24 Scalar and quantificational features that are common across categories affect the behaviour of nouns, verbs, and adjectives in a regular way (e.g., Kennedy, McNally 2005, among many others). Some abstract mass nouns are inherently bounded (or quantised) without being countable. Typically, such abstract mass nouns are unbounded, following the convincing line of thought in previous research on Estonian and Finnish (Ackerman, Moore 2001; Erelt et al. 1993; Kiparsky 1998, to mention some). As a suggestion for further perspectives on understanding the variation on mass objects in Ukrainian, a finer distinction in the behaviour of abstract mass nouns derived from adjectives could be studied. In Estonian, derived abstract nouns have their own scalar and boundedness properties. For instance, if the derived abstract mass noun is based on an adjective that is scalar but has no bound (e.g., 'popular', 'sad'), then the derived object is marked with

abstract nouns that differ from other mass nouns in case marking are also morphologically complex. Here, Finnic can offer new perspectives on further exploration. For instance, in Estonian, there is a significant difference between the case behaviour of abstract mass nouns based on their morphological structure, such as 'temperature' (underived), 'warm(th)' (derived), and 'cold' (derived).[25] As an interim summary, we have some supporting synchronic as well as diachronic evidence from the variation in Romance, Germanic, and Uralic languages that mass nouns vary regularly along the abstract-concrete axis. We may assume thus that Modern Ukrainian can be compared to general tendencies affecting the grammaticalisation of – and variation within – partitive structures.

Since in Modern Ukrainian, abstract mass nouns do not display a completely random pattern in case marking, we suggest examining the verb classes more precisely in their interaction with their objects. Case marking differences between concrete and abstract mass nouns are dependent on verb classification, as seen in Sections 2 and 3. Verbs that denote a change (typically, various incremental theme verbs) differ from those that do not (typically, intensional verbs). The vast literature on aspectual composition or on parallels between nouns and verbs in the tradition of Slavic studies (e.g., Mehlig 1996; Chuikova 2021) could be considered with Ukrainian mass nouns in view.

Without wishing to provide more than some suggestions for further study, we propose examining the interdependence between the lexical semantic features of the verb and the quantificational and other features of the object noun. Shifts in the lexical semantics of verbs are well attested in literature. Levin (1993, 172) discusses how verbs that are listed in one subclass of verbs are also found listed as members of other verb classes, but also highlighting that there are regularities (her discussion concerns creation verbs). Many traditional grammars list instances where the semantics of the verb undergoes a shift in figurative or metaphorical use, whereby a concrete object is understood abstractly. It has been noted in the literature that the figurative use of verbs is paired with genitive objects.[26]

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the partitive case ('add' V + 'popularity/sadness' OBJ > partitive marking); otherwise, the object is marked with the accusative case (Tamm 2014).

25   While all these nouns are synonyms in temperature expressions, they can have different features of boundedness that matter for case assignment, because there is another layer of semantic features that influences case (Tamm 2011). This layer is available for adjective-based, derived abstract mass nouns such as *soe* 'warmth, temperature above zero' and *külm* 'cold, temperature below zero'. It is not available for the equally abstract mass noun *temperatuur* 'temperature'.

26   Chuikova (2012, 102) notes that there is a strong tendency in Russian to have genitive objects that cannot be replaced by the accusative ones, if an abstract noun is used in a figurative sense or largely desemantised (part of a set phrase), and if it is not used in its direct meaning.

It cannot be excluded that a shift in verb meaning and the object case are related. They are regularly related in many languages, including for instance Finnic languages. In many Finnic languages, verbs such as 'want a good grade' or 'love Mary' have a partitive object case because of unbounded (imperfective) verb semantics. The abstractness, concreteness, countability or definiteness of the object does not matter for the object case of these verbs. If a verb allows both object cases, such as 'find', then the accusative typically emerges with a bounded – perfective verb meaning. The partitive occurs with the unbounded (imperfective) verb meaning. In the sense of 'find a key', the object is accusative, and in the metaphorical sense of 'find it (that it is) correct', the object is partitive. In the latter case, nothing is being 'found' in any concrete sense. In the lexical semantics that matters for object case, a verb like 'find' may fall in two classes. In some of its lexical meanings it belongs to the same class as 'want' or 'love' and differs from other concrete meanings of 'find'.

Ukrainian object case assignment may in part occur following a similar principle of patterning with verb meaning, not any direct inherent properties of the noun. For instance, an incremental theme verb (e.g., 'add') whose semantics entails portioning of its theme object (or subject), is semantically shifted to another lexical semantic class. This shift may relate to metaphorical uses and abstract objects. While changes in a concrete object can be semantically mapped to the progress of an event and time transparently, this mapping becomes opaque in case of metaphors and abstract objects. Consider the difference in adding more borscht on the plate, where the changes in the events are transparently related to the object matter. On the contrary, the event of adding optimism is less transparently related to optimism.

The interpretation of an incremental theme verb crucially depends on the quantificational properties of the theme argument, but this is irrelevant with abstract nouns. With perfective verbs, the partitive genitive interpretation depends on the possibility of interpreting the object as a portion of a mass, but again, abstract nouns render this distinction irrelevant. Abstract nouns may be of indefinite quantity, but they are also difficult to interpret as 'portionable'. Consider how to imagine a portion of experience, vigour, optimism, or confidence as opposed to a portion of borscht, water, or sugar. Abstract mass nouns, at least not typically, do not participate in the progress of an event as concrete mass nouns do. Thus, even if abstract mass nouns denote indeterminate quantity like other mass nouns or indefinite plurals, the incremental theme reading cannot readily be applied to an argument that is an abstract noun. An abstract entity cannot be portioned in increments. It seems that these increments are relevant not only for incremental theme verbs but also grammatical aspect and object case marking in Ukrainian.

Kuznetsova and Nesset (2015) show that Russian has considerable object case variation with verbs that have appeared exclusively with genitive case only in the past, such as 'be afraid', and they suggest that the variation is not random. We conducted an additional small scale corpus search and established that the verb *bojatysja* 'fear, to be afraid of' occurs in ukTenTen with the concrete singular noun *sobaka* 'dog' in 13 examples with the genitive case and in 3 examples with the accusative case. With the abstract noun *temrjava* 'darkness' and the verb *bojatysja* 'fear, to be afraid of', all the 110 examples that were found for this combination had a genitive object irrespective of tense, suggesting possible differences between the object case assignment of intensional verbs between modern variants of the two Slavic languages.[27] Additionally, we have some evidence from a small-scale experimental study, a Ukrainian discourse completion task that constrained the answers to the present tense: the objects of the intensional verb *bažaty* 'wish' were encoded invariantly in the genitive (Lehka, Chaika 2022). Ukrainian object case may be more dependent on verb class than the Russian one, based on our preliminary corpus and experiment-based forays into Ukrainian intensional verbs.

It is important to note that the literature on Ukrainian verb classes (Section 3) shows how entire verb classes determine the object case, either the genitive or the accusative. Both object cases pattern with abstract objects. Abstractness in itself does not change the object case pattern of a verb, as far as can be seen from the examples from the sources. Based on earlier traditional grammars, the group of accusative verbs always marks abstract objects that are only marked with the accusative, and intensional verbs have concrete noun objects that are only marked with the genitive (with exceptions under well-defined conditions). Abstract mass nouns clearly do not emerge with an inherently determined genitive. For further research, based on the possibility of parallels between nominal and verbal quantification that is reflected in object case marking, we suggest a similar avenue to explore.[28] Tentatively, the similarity concerns intensional verbs that frequently have abstract objects (e.g., 'optimism', 'experience', etc) and incremental theme verbs (e.g., 'add') used with abstract objects, which share an intensionality feature that may cause variation in object cases.

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27   These data reflect the total sum of singular objects in these combinations of verbs and objects. We excluded all sentences with the plural, negation and misclassifications.

28   From a related study on Russian intensional verbs, we find Kagan (2012) and Partee et al. (2012) discussing Russian genitive objects of intensional verbs in connection with negation and subjunctivity. Kagan (2012) explains the genitive of Russian abstract objects via the lack of the relative version of existential commitment.

7   Summary

This article has aimed at filling what we perceive as a gap in understanding aspect and object case alternation in Ukrainian. Ukrainian grammars often contain references to 'partitive genitive' and 'partiality' in their discussions of object case and Aktionsart prefixes. As one of the most important contributions of this article, we have reviewed the traditional grammar literature that is accessible only in Ukrainian. We have verified the descriptions from the point of view of two authors who are native Ukrainian speakers in their early twenties and a modern corpus of Ukrainian, ukTenTen 2020. We used the Sketch Engine system to provide quantifiable results and modern language samples for the relationships between Ukrainian aspect and case.

The relevant literature contains descriptions of grammatical aspect, verbs, prefixes, object case, and nominal properties, which we have used to explore the nature of the partitive genitive in Ukrainian. In the domain of verbs, we have reviewed the Ukrainian literature on aspect that characterises the verb category in Ukrainian, verbal prefixes, and verb classes in terms of their restrictions on object cases. The factors that previous sources discuss and that pertain to verb and noun semantics have been based on examples from older literary language. These factors have now been tested on a corpus containing modern Ukrainian, ukTenTen 2020. The corpus data show that there is a distinction between perfective and imperfective verbs in object case assignment. With the versions of the verb *varyty* 'cook', the partitive genitive appears predominantly with the perfective and not with the imperfective verb. However, as expected, the derivational Aktionsart prefix matters. Verbs with the prefix *na-* have genitive objects and significantly differ in the object case alternation from *z-/s-*, based on our study on the verb *varyty* 'cook'. However, *do-* diverges from them in a different way, because its meaning entails an action that is completed with regard to a predefined quantity of an object. The partitive genitive is therefore simply not compatible with the semantics that the prefix *do-* imposes on the object in the discourse: quantity that cannot be 'portioned' further.

In our study of abstract and concrete mass nouns, we found differences in object case marking, but it was difficult to establish if the genitive was of the partitive genitive type. The question of why concrete mass nouns and abstract mass nouns display differences in object case marking has not been explicitly addressed in the Ukrainian or any other sources we consulted. We did not find references to abstract mass nouns concerning their status as instances of partitive genitive. We have established that only concrete mass nouns give straightforward empirical evidence of the phenomenon referred to as the partitive genitive in Ukrainian. Our results point towards a

variety of factors that might apply for the diverging groups of mass nouns and their emergence as partitive genitives. We have provided some evidence from diachronic and synchronic sources from other languages where a cleavage between abstract and concrete mass nouns emerges in partitives.

We have provided some pointers to further research, as we have established that the combinations vary also based on verb classes. Our finding is that the perfective aspect and nominal indefinite quantity, traditionally seen as the uniform defining features of partitive genitives, could be reconsidered. Increments are also relevant for defining the phenomenon as we see based on abstract nouns. Even if abstract mass nouns denote indeterminate quantity like other mass nouns or indefinite plurals, the incremental theme reading cannot readily be applied to an argument that is an abstract noun: it cannot be portioned in increments. Increments are thus relevant not only for incremental theme verbs but also for perfective verbs where the progress of the events is unrelated to the themes.

We offer this work as a step in the direction of explaining the relationship between aspect, verbs, and object case variation in Ukrainian.

Abbreviations and Notations

1	first person
2	second person
3	third person
ACC	accusative
DAT	dative
GEN	genitive
F	feminine
IMPF	imperfective
PERF	perfective
M	masculine
NOM	nominative
PL	plural
PREF	prefix
PRT	particle
SG	singular
PTC	participle

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