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CONTAINMENT AND SUPPORT: SIMILARITIES AND VARIATION IN LITHUANIAN, LATVIAN AND ESTONIAN*

Abstract. This paper aims to describe how spatial semantic categories of CONTAINMENT and SUPPORT are expressed in three languages, – Lithuanian, Latvian and Estonian, – which are spoken in the same area, though only the first two of them are genealogically related. Our research is based on a production task (n = 60 for each language) consisting of answers to picture stimuli representing major subtypes of CONTAINMENT and SUPPORT: full containment, partial containment and interlocking for CONTAINMENT and support-from-below, adhesion, hanging and encirclement with contact for SUPPORT. The results show that the core types of CONTAINMENT and SUPPORT, namely, full-containment and support-from-below, are expressed most homogenously and using least terms in all three languages, but other sub-types trigger more variety. Cross-linguistically, CONTAINMENT is expressed similarly in the Baltic languages, but in terms of conceptualization and expression of SUPPORT, Latvian and Estonian share more commonalities. This provides new evidence for semantic diversity of the Baltic languages and language-contact induced peculiarities of Latvian.
Keywords: Lithuanian; Latvian; Estonian; spatial semantics; containment; support; cross-linguistic differences; spatial cases; adpositions.

1. Introduction and background to the approach

Containment and support are usually called topological[1] spatial relations which are defined as spatial situations with the two elements of the spatial

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[1] Levinson and Wilkins (2006, 3) outline the framework to the study of spatial language in which static contexts are divided into non-angular (*topology*) and angular (*frames of reference*). Although it is common to use the term *topological* for non-angular

scene, the Figure and the Ground[2], being contiguous or in a close proximity with each other (Levinson, Wilkins 2006, 3–4, 514). Containment and support meet the conditions of topology in the sense that the Figure and the Ground have certain features (e.g., interior, exterior, boundary) that enable topological relations of containment, touching, covering, intersecting, or overlapping. However, as noted by Landau (2017, 329, 344), labelling containment and support as topological relations does not reflect the functional aspects of containing and supporting; namely, the force-dynamic interaction between the Figure and the Ground which is extremely important for conceptualization of so-called geometrically constrained topological spatial relations. This brings us to a long-lasting debate on how topology (and geometry) and function (or force-dynamic properties) affect the perception of spatial relations, and which of these two factors is more involved in the usage of different spatial terms.

The aforementioned question is probably one of the main reasons why containment and support relations have received so much attention. Earlier analysis defines the means for expressing containment and support (usually prepositions) in terms of geometry (e.g., Cooper 1968; Bennett 1975, among others). The geometric core-meaning approach is gradually extended with additional properties, e.g., Herskovits, in addition to geometrically defined ideal meaning of a preposition, provides a list of use types generated by pragmatic near-principles of salience, relevance, tolerance and typicality (Herskovits 1986, 18, 73ff). It seems obvious that geometry alone cannot provide an appropriate account for spatial perception and language. The question is as to what extent geometry and / or function are determining. Vandeloise (1991; 1994) emphasises functional properties.

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prepositions, such as English *in*, *on*, *at*, this label is not fully accurate. Strictly speaking, both support and containment are geometrically constrained relations because once we think of support, we have to involve vertical axis and once we think of containment, in most everyday situations a much weaker interpretation than topological containment is used (in most situations it is a convexity-based geometric relation; topological containment is a very strong and less frequently found).

[2] In this article, we use the terms *Figure* and *Ground* to name the two basic constituents of the spatial scene. The Figure object is the object that has to be located whereas the Ground object is a reference point in relation to which the Figure is located (Talmy 1972; 2000a).

If the Ground object performs the function of, for instance, containment, its dimensionality turns out to be of secondary importance. The functional geometry approach focuses on the interaction between geometric information and extra-geometric information where the latter is defined as dynamic-kinematic routines (typical everyday spatial interactions) combined with our knowledge of the objects and their interplay (Coventry, Garrod 2004, 55). Experimental evidence shows that different spatial scenes have different impacts of geometry and function. The less prototypical geometric relations, the more functional information is considered, and vice versa (Coventry et al. 1994; Garrod et al. 1999). In a recent study, Landau (2017) states two different classes of English prepositions: functional or force-dynamic (*in* and *on*) vs. geometric (*right / left* and *above / below*). She observes that the core meanings of containment and support prepositions are determined by force-dynamic properties. Although *in* and *on* appear very early in L1 (Johnston, Slobin 1979), their acquisition is gradual and long-term depending on the introduction of new contexts containing these prepositions. *Above / below* and *right / left*, however, are defined in terms of geometric features, such as distance and direction, and their acquisition is not as complex, thus geometric terms are fully mastered earlier (Landau 2017, 15). Taking into account different geometric and functional attributes, topological prepositions in English are also studied by Navarro i Ferrando (1998), Feist (2000), Feist, Gentner (2003; 2012) and Gärdenfors (2014), among others.

The previously mentioned works deal with the question of geometric vs. functional properties exploring one language. Cross-linguistic treatment of spatial domains is one more crucial issue that is well-explored showing a large diversity of both spatial conceptualization and spatial language. For example, when expressing containment and support relations, English employs prepositions *in* and *on* reflecting the ability of the Ground to control the Figure by containing and supporting, but Korean speakers structure the corresponding semantic domains according to the tight / loose fitting of the Figure in or on the Ground object (Bowerman 1996, 145ff; Bowerman, Choi 2003; Yun, Choi 2018). In Levinson and Wilkins (2006), the spatial domains of containment and support are explored using the Topological Relations Picture Series (TRPS) of 71 drawings depicting 22 partially overlapping subtypes (Bowerman, Pedersen 1992). The results show high cross-linguistic and cross-cultural variation and different patterns

of distribution of spatial information. A TRPS-based study by Gentner and Bowerman (2009) focuses on containment and support expressions in Dutch and English. Dutch (along with German) seems to be one of the "most exotic" languages in structuring the support domain (Gentner, Bowerman 2009, 470) as it carves this semantic space with three different prepositions: Dutch *op* for support-from-below (or "solid support"), *aan* for attachment (or "tenuous support") and *om* for encirclement with contact (see also Cuyckens 1991; Beliën 2002; van Staden et al. 2007). In English, all these subtypes of support are expressed by a sole preposition *on*. Consistently, such a linguistic encoding has consequences for language acquisition. Dutch children acquire the support domain later than English children. Furthermore, among the prepositions of the support domain, they firstly acquire *op*, which covers prototypical support. Similar results are presented in recent research by Landau et al. (2017), in which a newly developed battery of 44 pictures is applied in order to explore the internal structure of containment and support and compare the encoding of these categories in Modern Greek and English. In accordance with previous cross-linguistic research, containment is carved into loose-fit and tight-fit full containment, loose-fit and tight-fit partial containment, interlocking and embeddedness, but the support category is divided into gravitational support, embedded support, support via adhesion, support via hanging and support via point-attachment. Certain types represent the core of the categories and thus are more natural and acquired by children at an earlier stage (Landau et al. 2017; Johannes et al. 2016).

The idea for the present study mainly comes from three aspects discussed above: the impact of geometry and function on spatial relations, the complex structure of spatial categories and cross-linguistic variation of such a structure. In this paper, we aim to present how containment and support are expressed in three languages: Lithuanian, Latvian and Estonian. Relying on existing studies, especially by Landau (2017), Landau et al. (2017), Galton (2000), Levinson, Wilkins (2006), Gentner, Bowerman (2009), we argue that the categories of CONTAINMENT and SUPPORT[3] are broad and complex, consisting

[3] Categories of containment and support denote conceptual domains covering variety of spatial situations. Conceptual categories do not represent language specific categories. Small caps here and henceforth mark conceptual categories.

of different subtypes. In order to compare the cross-linguistic similarities and variation in expressions of CONTAINMENT and SUPPORT, we have chosen an experimental approach with precisely defined category subtypes: the SUPPORT category is divided into 4 subcategories whereas CONTAINMENT is divided into 3, which will be expressed in more detail further. In this research, we also test the functional constraints for the perception of containment and support and attempt to compare them to geometric ones. We assume that both geometry and function (or everyday spatial experience) are important in perception of these spatial relations. Our previous study (Žilinskaitė-Šinkūnienė et al. 2019) focuses on geometric constraints on spatial language. We have applied an extended Region Connection Calculus framework (RCC; Randell et al. 1992; Cohn et al. 1992; Šķilters et al. (MS)) trying to identify the determining geometric primitives for the perception of containment and support relations. We analysed 8 support stimuli displaying above / below orientation of two equal circles, the Figure and the Ground, in external connectedness, partial overlap and partial occlusion, as well as 5 containment stimuli depicting non-tangential proper-part (*NTTP*, centred and oblique), tangential proper part (*TTP*, oblique), and inverse relations of non-tangential and tangential proper part. Interestingly, the results of the production task showed that the support stimuli were hardly described employing a typical support preposition, namely Lithuanian (henceforth – LT) [*ant* + Gen.] and Latvian (henceforth – LV) [*uz* + Gen.] 'on'. Even in the situation of canonical vertical alignment with the Figure situated in the upper part, support prepositions LT [*ant* + Gen.] resp. LV [*uz* + Gen.] 'on' occur rather marginally since the participants do not focus on the functional feature of support, but they instead concentrate on the orientation of the Figure in relation to the Ground; namely, they use the terms for above orientation or proximity. This indicates that the role of object knowledge shapes spatial relations to a more substantial extent than assumed before. The results of containment stimuli suggest that *NTTP* and *TTP* containment is expressed with the Locative case in the Baltic languages. Importantly, the Locative case of spatial nominals (*inner part*, *middle*, *center* of the Ground object) appears more frequently than the Locative of the Ground lexeme (*circle*). On the one hand, these results show the expression of containment and support in the geometric framework, but on the other hand, they also reveal some discrepancies between the geometric and functional approaches, implying that both containment and support should be further analysed using functional

stimuli which display real-life objects in everyday situations and reflect usual force-dynamic interaction of the Figure and the Ground objects.

2. Means for expressing spatial relations in Lithuanian, Latvian and Estonian

The language sample consists of three languages (Lithuanian, Latvian and Estonian) which are spoken in the same area of Northern Europe. Estonian is a Finnic language (Uralic, Finno-Ugric), but Lithuanian and Latvian are Baltic languages (Indo-European, Eastern-Baltic branch). Even though the Baltic languages are closely related, as a result of language-contact, in certain aspects they are considerably different. Throughout history there have been different currents of external influence, but in general, Lithuanian was mostly influenced by Slavonic languages and German (the latter was more significant in the first period of written Lithuanian language[4]). Latvian was mostly affected by Finnic languages (Livonian and Estonian) and Middle Low German, while Slavonic influence was extensive in the Eastern part of Latvia (Latgale). Researchers have observed striking similarities between Finnic and Latvian as areal phenomena or syntactic borrowings (Endzelin 1951; Wälchli 2001b; Holvoet 2001b, 89–90). Considering spatial language, there are noticeable differences between the Baltic languages which are usually mentioned in relation to Finnic languages. Perhaps the most obvious parallels are observed in expressions of clothing, e.g.:

(1) Latvian *Viņ-ai* *ir* *kurp-es* ***kāj-ās***.
3-DAT.SG.F be.3.PRS shoe-NOM.PL foot-LOC.PL
'She is wearing shoes.' (personal knowledge)

(2) Livonian[5] *Tiņ,* *toņ* *mōņikā,* *pitkā* *vīzõz*
INTJ INTJ peasant.NOM.SG long.NOM.SG bast-shoe.NOM.SG
jālga-s *[...].*
foot-INE
'*Tiņ, toņ,* peasant, you are wearing bast shoes.' (Loorits 1936, 43)

[4] The printed sources in national languages in both Latvia and Lithuania date from the 16th century. In the 16th–17th century Lithuania three varieties or traditions of written Lithuanian existed: the written language in Lithuania Minor (or the Duchy of Prussia) and two variants in Lithuania Major (or the Grand Duchy of Lithuania) (Zinkevičius 1996, 227–255). In Lithuania Minor, the texts were mostly translated from German but in Lithuania Major – generally from Polish. Latvian religious texts were translated from German.

[5] We are grateful to Valts Ernštreits for providing this example to us.

(3) Estonian *Poisi-l* *on* *saapa-d* ***jala-s***.
boy-ADE.SG be.3.PRS shoe-NOM.PL foot-INE
'A boy is wearing shoes.' (Pjall' 1955, 45)

This Finnic construction, which is also found in Finnish (Karlsson 1999, 108), Veps (Brodskij 2008, 19) and Votic (Ariste 1968, 24), is taken over by Latvian. Differences between the Baltic languages and interesting correspondences between Latvian and Finnic also appear in expressing certain types of support. But before moving to the experimental data, we will describe the means for encoding space in Lithuanian, Latvian and Estonian.

2.1. Estonian

Fino-Ugric languages are usually described as agglutinative, but Estonian diverges from them and is characterised as "more fusional and analytic than the languages belonging to the northern branch of the Finnic languages" (Erelt 2007a, 7). It has fourteen cases that encompass series of spatial cases differentiated according to movement (stasis / kinesis) and orientation (inner / outer), namely, Elative-Inessive-Illative and Ablative-Adessive-Allative (Erelt et al. 2007), cf. forms of these cases for lexemes *kauss* 'bowl' and *laud* 'table' in Table 1. The endings of the spatial cases are added to the Genitive form of nouns or adjectives. The Illative has the ending *-sse* (*kausi-sse*), but it has also the short form (*kaussi*) which is preferred for certain lexemes. The short form may end with the vowel, as in the Table 1 (*kaussi*), or may have endings *-de*, *-te*, *-he*, *-hu* (as in *keelde*, *kätte*, *pähe*, *suhu* 'into language, hands, head, mouth', Tuldava 1994, 86).

Table 1. **Series of spatial cases in Estonian**

	inner cases	*outer* cases
SOURCE *kust?* 'where from'	**Elative** *kausi-st* 'from the bowl'	**Ablative** *laua-lt* 'off the table'
LOCATION *kus?* 'where'	**Inessive** *kausi-s* 'in the bowl'	**Adessive** *laua-l* 'on the table'
GOAL *kuhu?* 'where to'	**Illative** *kausi-sse* or *kaussi* 'into the bowl'	**Allative** *laua-le* 'onto the table'

In addition to spatial cases, spatial information is also expressed employing adpositional phrases. Most of them are postpositional (74%), but there are also prepositions (16%) and ambipositions (10%) (Grünthal 2003, 56–59;

for ambipositions see Ruutma et al. 2016). Postpositions, e.g., *sees* 'in', *peal* 'on', *otsas* 'at the end, at the top', *juures* 'at', *kõrval* 'next to, beside', *ääres* 'by', originally are the Inessive or Addesive forms of the nouns *pea* 'head', *ots* 'tip, end', *juur* 'root', *kõrv* 'ear', *äär* 'edge'. Most of the postpositions require the Genitive case and nearly all of them are declinable; namely, according to their meaning, they may appear in inner or outer spatial cases, cf.

Estonian (personal knowledge)

(4) *Õun* *on* ***kausi*** ***see-s*** / ***kausi-s***.
apple.NOM.SG be.3.SG bowl.GEN.SG in-LOC bowl-LOC
'An apple in a bowl.'

(5) *Raamat* *on* ***laua*** ***pea-l*** / ***laua-l***.
book.NOM.SG be.3.SG table.GEN.SG on-ADE table-ADE
'The book is on the table.'

The alternation of spatial cases and certain adpositions in Estonian does not necessarily imply their synonymy. Studies on the Adessive and postposition *peal* 'on' reveal that different morphosyntactic and semantic factors are involved in choosing one or another means. Experimental study demonstrates that the kind of the Ground and the nature of relation between the Figure and the Ground play an important role: the Adessive is preferred when the Ground is a place and the relation between the Figure and the Ground is abstract, but *peal* – when the Ground is a thing and the relation is spatial and non-canonical (Klavan et al. 2011). When spatial relation is canonical, both means are attested and thus other factors, such as the type of the Ground and the kind of contact, become determining (idem). Corpus-based research of the Adessive and *peal* 'on' also confirms the importance of the nature of the Ground: inanimate static Grounds favour the Adessive while mobile Grounds are used in adpositional phrase (Klavan 2014).

Estonian also has verb particles that usually express location and direction, e.g., *kukkus alla* 'fell off' (Erelt 2007b, 101). Recent research on Estonian motion verbs shows that according to Talmian lexicalization patterns, Estonian takes an intermediate position between verb-framed and satellite-framed languages as it elicits both lexicalization patterns; it may conflate both manner or path in a verbal root (Taremaa 2017, 288).

2.2. The Baltic languages

The Baltic languages are inflectional languages with similar case systems. Excluding Vocative, Standard Lithuanian has 6 cases (Nominative, Genitive, Dative, Accusative, Instrumental and Locative). Latvian nominal paradigm differs in that it lacks an instrumental case as the Baltic Instrumental is formally merged with the Accusative in singular and the Dative in plural (Fennel 1975; Andronov 2001; Holvoet 2010; among others).

It is worth mentioning that the Baltic languages had more cases in their paradigms: there were four locative cases in East Baltic. They are called postpositional locative cases, because historically they were formed by attaching postpositions to already existing case-forms (Zinkevičius 1996, 111–113). The rise of them is usually explained by the influence of the Finnic series of spatial cases. The four locative cases were differentiated in terms of orientation (inner vs. outer cases) and motion (static vs. kinetic cases): Inessive (present Locative, expressing inner location), Illative ('into'), Adessive ('in one's personal sphere' for animate Grounds and 'at, by, near' for inanimate ones), and Allative ('to, towards'). Semantic properties of these cases are also shown in Table 2, where spatial meanings for inanimate Grounds are provided. However, postpositional locative cases are highly polysemous. This is especially valid to outer cases, since their non-spatial or abstract meanings are often related to the animacy of the Ground object.

Table 2. **Spatial cases in Old Lithuanian**

	interior	exterior
stasis	**Inessive** *miške* 'in the forest'	**Adessive** *miškiep* 'next to the forest'
kinesis	**Illative** *miškan* 'into the forest'	**Allative** *miškop* 'to the forest'

Nowadays Adessive and Allative are extinct (except for a few Lithuanian dialects and some adverbs of Allative origin, like *vakarop* 'towards evening', in Standard Lithuanian). Illative is not considered as a member of the case system. Even though the latter case is fully productive in Modern Lithuanian, it is usually stylistically marked[6] (more about the four locative cases in Kavaliūnaitė 2002; Žilinskaitė-Šinkūnienė 2016).

[6] With certain exceptions, e.g. linguistic cliché (legal discourse), where only Illative is possible: *patraukti baudžiamojon atsakomybėn* 'prosecute'.

In Old Latvian, the outer cases were not used except for a few examples of the Allative[7], e.g. *celt / mesties kājop* 'arise', *laist / iet vīrop* 'let someone go to husband', which means 'to get married'. Location and direction were expressed using both Inessive and Illative cases in singular (without any semantic difference) and Inessive in plural, but finally only Inessive (present Locative) was established as a sole locative case (Rosinas 1987; 2001; cf. Vanags 1992).

Standard Baltic languages have only one Locative case. It primarily marks topological or geometrical inclusion in both small- and large-scale[8] environments and the Ground object performs a function of containment, e.g.:

(6) Lithuanian *O mano* ***krepš-yje*** *lauktuv-ės tau –*
but 1.SG.POSS bag-LOC.SG present-NOM.PL 2.SG.DAT
du džino buteliai.
two.NOM.M gin-GEN.SG bottle-NOM.PL

Latvian *Bet* ***man-ā*** ***som-ā*** *ir ciemkukul-is*
but 1.SG.POSS-LOC bag-LOC.SG be.PRS.3 present-NOM.SG
tev – div-as pudel-es džina. (LILA)[9]
2.SG.DAT two-NOM.F bottle-NOM.PL gin-GEN.SG
'But in my bag there is a present for you – two bottles of gin.'

The dynamic counterpart of the Baltic Locative case in Standard languages are the prepositions LT [*į* + Acc.] and LV [*uz* + Acc.] 'to'. However, in Latvian, the same function can also be expressed by the Locative case, cf. the Latvian expression of the goal of motion with [*uz* + Acc.] in (7) and with the Locative case in (8). In Standard Lithuanian, both these phrases are expressed with preposition [*į* + Acc.] 'to':

(7) Latvian *Es arī grib-u ie-t* ***uz*** ***slidotavu,***
1.SG.NOM also want-PRS.1SG go-INF to rink.ACC.SG
bet man-i ne-ņem.
but 1SG-ACC NEG-take.PRS.3

[7] Otherwise the Allative is attested in present-day adverbs like *augšup* 'up', *lejup* 'down', *mājup* 'towards home', *šurp* 'hither', *turp* 'thitherward(s)'.

[8] Small scale spatial relations are within the visual scope whereas large-scale spatial relations are perceived while moving and navigating (and generating cognitive maps).

[9] Lithuanian and Latvian data come from several sources: *Lithuanian-Latvian-Lithuanian parallel corpus* (LILA, 8 million tokens), *Corpus of the contemporary Lithuanian language* (CCLL), *Corpus of contemporary Latvian* (LVK2018, 12 million tokens).

Lithuanian *Aš* *irgi* *nori-u* ***į*** ***čiuožyklą***. (LILA)
1.SG.NOM also want-PRS.1SG to rink.ACC.SG
'I also want to go to the skating rink but no one takes me there.'

(8) Latvian *Pasažier-iem* *liek* *iet* ***kajīt-ēs***.
passenger-DAT.PL tell.PRS.3 go.INF cabin-LOC.PL
Lithuanian *Keleiviams* *liepiama* *eiti* ***į*** ***kajutes***. (LILA)
passenger.DAT.PL tell.PPRP.NA go.INF to cabin.ACC.PL
'Passengers are asked to go to cabins.'

According to Zaika (2016), who also refers to Miljuxina (2012), the alternation of the Locative and [*uz* + Acc.] is based on the intention to highlight either the endpoint of motion or the dynamic character of motion. For this reason, [*uz* + Acc.] seems to be incompatible with verbs with the preverb *ie-* which indicate that the endpoint is reached (Holvoet 1993, 135). Thus, it would be impossible to use the preposition [*uz* + Acc.] in the two following Latvian sentences:

(9) Latvian *Florenc-e* *ie-iet* ***frizētavā***.
PN-NOM PVB-go.PRS.3 salon-LOC.SG
Lithuanian *Florencij-a* *į-eina* ***į*** ***kirpykl-ą***. (LILA)
PN-NOM PVB-go.PRS.3 to salon-ACC.SG
'Florence walks into the hairdressing salon.'

(10) Latvian *mašīn-a* *ie-triec-ā-s* ***kok-ā***.
car-NOM.SG PVB-crash-PST.3-RFL tree.LOC.SG
Lithuanian *mašin-a* *at-si-trenk-ė* ***į*** ***medį***. (LILA)
car-NOM.SG PVB-REFL-crash-PST.3 to tree.ACC.SG
'The car crashed into the tree.'

The Lithuanian [*į* + Acc.] 'to' may also alternate with the Locative case, but this alternation is different from the one in Latvian as it occurs with some semantic groups of verbs only, e.g., *klimpti* 'sink, stick in', *smegti* 'sink, subside', *grimzti* 'sink, plunge', *dėti* 'put', *guldyti* 'lay down', *sėti* 'sow', *sodinti* 'plant', *tilpti* 'fit in', *talpinti* 'put, place, contain', *rinktis* 'gather (together)' (for concise description see Valiulytė 1998, 44–63; for comparison with Slavonic languages see Zaika 2016).

For expressing static spatial relations other than containment, the Baltic languages employ prepositions governing different cases[10]. The same prepositional phrases are also used in dynamic contexts, thus governed by verbs of motion they denote the goal of motion, cf. canonical support preposition LT [*ant* + Gen.] and LV [*uz* + Gen.] 'on' in (11) and (12):

(11) Lithuanian ***Ant*** ***stal-o*** *stovėj-o* *lėkštės,*
on table-GEN.SG stand-PST.3 plate-NOM.PL
iš-teplio-t-os *padaž-u.*
PVB-steam-PST.PP-NOM.PL.F sauce-INSTR.SG

Latvian ***Uz*** ***galda*** *stāvēj-a* *ar* *mērc-i*
on table-GEN.SG stand-PST.3 with sauce-ACC.SG
no-zies-t-i *šķīvj-i.* (LILA)
PVB-steam-PST.PP-NOM.PL.M plate-NOM.PL
'There were plates (standing) on the table steamed with sauce.'

(12) Lithuanian *Paslaugi-ai* *pa-dėj-au* *kav-ą* *j-ai*
helpful-ADV PVB-put-PST.1.SG coffee-ACC.SG 3-DAT.SG.F
ant ***stal-o***.
on table-GEN.SG

Latvian *Pakalpīg-i* *no-lik-u* *kafij-u*
helpful-ADV PVB-put-PST.1.SG coffee-ACC.SG
uz ***viņ-as*** ***gald-a***. (LILA)
on 3-GEN.SG.F table-GEN.SG
'Helpfully I have put coffee on her table.'

The Baltic languages also have postpositions. According to traditional account, their meaning is not spatial (e.g., LT *dėka* 'thanks to' or LV *dēļ* 'because of', *labad*, *pēc* 'for'). However, Holvoet suggests that Latvian employs more postpositions: they are indeed spatial and are based on relational nouns, such as *vidū* 'in the middle', *virsū* 'on the top', *priekšā* 'in front of', *apakšā* 'below' etc.[11] Postpositional usage of such words are predominant, but they may also occur prepositionally, cf. (13) and (14) :

[10] Lithuanian prepositions govern the same case both in singular and plural; they take either the Genitive, Accusative or Instrumental. Latvian prepositions take the Genitive, Dative or Accusative case in singular, but in plural they govern the Dative. A concise description of emergence of the Dative as the prepositional case in the plural, based on Endzelīns' assumptions, can be found in Berg-Olsen 2004, 105–107.

[11] Originally, they are the Locative case forms of relational nouns *virsa* 'top', *vidus*

Latvian (LVK2018):

(13) *Kāpēc Emm-as* ***spogul-im*** ***virs-ū*** *meln-s* *plīvur-s?*
why Emma-GEN.SG mirror-DAT.SG top-LOC.SG black-NOM.SG.M veil-NOM.SG
'Why is there a black veil on Emma's mirror?'

(14) *Cilvēk-s* *guļ* ***virs-ū*** ***kok-a*** ***zar-iem,***
man-NOM.SG lie-PRS.3 top-LOC.SG tree-GEN.SG branch-DAT.PL
rok-a *ārā.*
arm-NOM.SG out
'A man lying on the branches of the tree with the arm out.'

Relational noun-based adpositions can take either the Genitive (which originally is a possessive Genitive) or the Dative. The government of the Dative in spatial constructions with the relational noun-based postpositions originates from the external possession constructions in which the adnominal possessive Genitive was replaced by *dativus sympatheticus*. Contrary to Lithuanian and the other IE languages, in Latvian this process was not restricted solely to animate possessors (Holvoet 1993; 2011).

In addition to relational noun-based adpositions, Latvian also has a separate class of ambipositions that in the Latvian grammatical tradition has been described as semi-prepositions (*pusprievārdi*) (MLVG, 701, 723), but also called *relational adverbs* (term proposed by Lagzdiņa 1997, 193) or *prepositional adverbs* (Smiltniece 2013, 600). Most of relational adverbs have spatial meaning, e.g., *apkārt* 'around', *blakus / blakām* 'next to', *cauri* 'through', *līdzās* 'next to', *līdzi* 'together', *pakaļ* 'after', *pāri* 'over', *pretī / pretim / iepretim* 'in front of' etc., see example (15). These adverbs in certain syntactic structures are able to govern nominals in the Dative and appear in either prepositional (16) or postpositional (17) order. The usage of the Dative case stems from the constructions with relational-noun based adpositions.

'middle', *priekša* 'front', *apakša* 'bottom', but even though "these relational nouns are assisted by case endings and prepositions proper, the claim that these nouns are used adpositionally seems nonetheless justified: it is based on the fact that these nouns have no typical nominal reference." (Holvoet 2011, 87). Cross-linguistically, such relational concepts often evolve to spatial concepts (grammaticalization cline: body part or landmark > relational concept > spatial reference point, Heine 1997, 39; also Svorou 1994).

Latvian (LVK2018):

(15) *Pa-skat-ie-s,* *kād-s* *skaistum-s* ***apkārt!***
PVB-look-IMP.2.SG-RFL what-NOM.SG.M beauty-NOM.SG around
'Look, what a beauty around!'

(16) ***Apkārt*** *pilsēt-ai* *bija* *iz-rak-t-s*
around city-DAT.SG be.PST.3 PVB-dig-PST.PP-NOM.SG.M
dziļ-š *kanāl-s.*
deep-NOM.SG.M canal-NOM.SG
'A deep canal was dug around the city.'

(17) *Zon-ai* ***apkārt*** *dzeloņdrāš-u* *žog-s,* *sarg-i,*
jail-DAT.SG around barbed-wire-GEN.SG fence-NOM.SG guard-NOM.PL
palaikam *kaut* *kur* *rej* *suņ-i.*
from-time-to-time IDEF where bark.PRS.3 dog-NOM.PL
'The jail is surrounded by barbed wired fence, guards, from time to time dogs are barking somewhere.'

Prepositional adverbs can also be omitted and the constructions with the Dative only are used, cf. examples from our data:

(18) *Jost-a* ***ap****-lik-t-a* ***kofer-im****.*
belt-NOM.SG PVB-put-PST.PP-NOM.SG.F suitcase-DAT.SG
'The strap is wrapped around the suitcase.'

(19) *Objekt-s* *ir* ***ap****-lik-t-s* ***kofer-im*** ***apkārt****.*
object-NOM.SG be.PRS.3 PVB-put-PST.PP-NOM.SG.M suitcase-DAT.SG around
'The object is wrapped around the suitcase.'

Thus, along the adpositional phrases with the Dative (19), the Dative in (18) occurs alone and is governed by the verb. According to Holvoet (2001b), the transfer of the Dative from adpositional phrase to the domain of verbal government is explained by two circumstances. Firstly, it was the spread of the *dativus sympatheticus* instead of the possessive Genitive in above mentioned constructions containing relational noun-based adpositions and relational adverbs. Secondly, "the tendency to mark aspectual distinctions by opposing prefixed verbs to phrasal verbs with adverbs that may also function as adpositions has led to the transfer of this dative from adpositional phrases to the domain of verbal government." (Holvoet 2001b, 93).

In addition to the Locative case and adpositions, the Baltic languages express spatial meanings also employing adverbal elements. Verbal prefixes

are common-Baltic, they mark perfectiveness, and in some cases they also convey certain orientational meaning, cf. LT *eiti*, Latvian *iet* 'go' and LT ***į**-eiti*, LV ***ie**-iet* 'go inside' (for more on Baltic prefixes see Kozhanov 2016). Along with the verbal prefixes, Latvian also has verb particles, e.g., *iet* ***iekšā*** 'go in', *iet* ***ārā*** 'go out', *iet* ***cauri*** 'go through', *iet* ***pakaļ*** 'go behind, i.e. follow', *iet* ***līdzi*** 'go along' etc. Latvian verb particles functionally resemble verbal prefixes, e.g., cf. ***ie**-iet* and *iet* ***iekšā*** 'go in', but they exhibit a different degree of grammaticalization of telicity, namely, verb particles perform more imperfective-like functions while preverbs express perfectiveness (Wälchli 2001b, 414–420; cf. Holvoet 2001a, 146). The difference in telicity is obvious when the verb with verb particle also gets the prefix, e.g.:

Latvian (LVK2018)

(20) *Ei, k-o tad tu? K-o tu šitā?*
hey what-ACC.SG then 2SG.NOM what-ACC.S 2SG.NOM thay-way
Kāpēc ***ne-laid*** ***iekšā****? [...]* ***laid*** *taču* ***iekšā****! [...]*
why NEG-let.PRS.2.SG in let-IMP.2.SG really in
Ie-laid-u *viņ-u* ***iekšā*** *un tūlīt pat*
PVB-let-PST.2.SG he-ACC.SG in and immediately
sa-grāb-u aiz apkakl-es.
PVB-grab-PST.2.SG behind collar-GEN.SG
'Hey, what are you doing? Why are you acting like this? Why don't you let me in? Let me in! I let him in and immediately grabbed him by the collar.'

Latvian verb particles share parallel development and mutual diachronic interference with Southern Finnic verb particles (Wälchli 2001a, 315–317; 2001b, 414–420). Lithuanian, however, may employ a few similar verb particles, e.g., in addition to ***į**-eiti* 'go inside' and ***nu**-mesti* 'throw down', one can say *eiti* ***laukan*** 'go out', *mesti* ***žemėn*** 'throw down' where postverbs *laukan* and *žemėn* originally are the Illative forms of nouns *laukas* 'outside' and *žemė* 'earth, soil'. However, such syntagms exhibit dialectal usage mostly (see Girdenis, Kačiuškienė 1986; Mikulskas 2003). In the Northern dialects of Lithuania these postverbs function mainly as aspectual markers (so-called perficientives), while in other dialects they may only have spatial (directional) meaning (Mikulskas 2003).

The above-mentioned grammatical elements for expressing spatial meaning in the Baltic languages show that space is expressed employing both adnominal and adverbal means. In addition, lexical elements, especially the

verb, usually render the meaning of directed motion and manner of motion. Thus, according to Talmian lexicalization patterns (Talmy 2000b), the Baltic languages are satellite-framed. But as noted by Wälchli, such typology is too narrow for its focus on verbs only: "Displacement can be encoded by verbs (verbally), by pre- or postpositions and case (adnominally), and by verbal affixes or verb particles (adverbally), or, as it is actually the case for most languages, by a combination of the verbal, adnominal and adverbal slots" (Wälchli 2001a, 300). Spatial relational information is spread among the different elements of the utterance exhibiting the principle of (overtly) distributed spatial semantics (Sinha, Kuteva 1995).

Even though the Baltic languages share a lot of common features in employing the Locative case and prepositions, there are, however, obvious differences both in usage of common-Baltic elements (e.g., broader semantic scope of the Locative case in Latvian as is shown in examples 8–10) and in employing different spatial grams[12], such as Latvian postpositions, ambipositions and verbal particles. The latter cases are usually explained in the light of contact of Latvian and Estonian. In some cases, syntactic or semantic borrowing is quite clear (as the structure of Latvian expressions for clothing in the example (1)), but other phenomena are more complicated (such as mutual interference of Estonian and Latvian is observed in development of verbal particles (Wälchli 2001b) or the development of Latvian postpositions (Holvoet 1993, 144ff.). This paper does not aim to address the theoretical questions of language contact but rather to provide additional empirical evidence for linguistic variation of expressions of containment and support for these languages by means of experimental study described further.

3. The experiment

3.1. Stimuli and set-up

In order to test functional constraints for the perception of containment and support relations as represented in Lithuanian, Latvian and Estonian, we have developed a battery of 66 pictures depicting small-scale spatial scenes of CONTAINMENT and SUPPORT with two objects serving as Figure and Ground, performing their normal function in every day routines, and reflecting typical aspects of interaction. The set consists of 66 stimuli (35 test stimuli, 28 fillers

[12] The term *spatial gram* is used for any grammatical element which renders spatial meaning (Svorou 1994, 31).

and 3 test items). Within the test stimuli, the category of CONTAINMENT is represented by 3 subcategories (full containment, partial containment and interlocking) while SUPPORT is represented by 4 subcategories (support-from-below, adhesion, hanging and encirclement with contact) of 5 stimuli each. All the stimuli are listed in the Tables 3 and 4. Example of each subcategory is provided in the Table 5.

Table 3. **Stimuli of CONTAINMENT category**

CONTAINMENT		
Full containment	**Partial containment**	**Interlocking**
Apple in bowl	Laptop in bag	Clock in a piece of amber
Drink in glass	Spoon in cup	Bird in glass ball
Shoes in box	Handkerchief in box	Plug in outlet
Round candle in candle holder	Knife in watermelon	Key in lock
Soap in soap container	Flower in vase	Screw in a board

Table 4. **Stimuli of SUPPORT category**

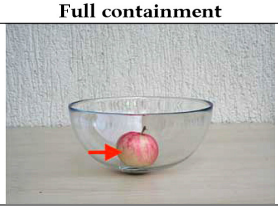
SUPPORT			
Support-from-below	**Adhesion**	**Hanging**	**Encirclement**
Pot on stove	Tape on box	Pendant on chain	Thread around spool
Helmet on rack	Magnet on fridge	Lamp on ceiling	Strap around suitcase
Cup on table	Stamp on envelope	Clock on wall	Strip around bouquet
Knife on cutting board	Sticky note on laptop	Swings on branch	Ribbon around gift
Carpet on floor	Sign on door	Bag on hook	Bindweed around tree

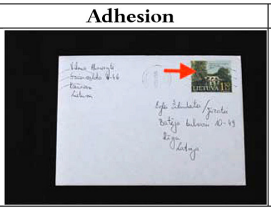
The rationale behind the series of stimuli was to represent different types of the categories of CONTAINMENT and SUPPORT choosing various geometries, positions and interaction of the Figure and the Ground. In the CONTAINMENT category, full containment usually reflects the most natural relation. In partial containment, the Figure protrudes from the Ground and in some cases the larger part of the Figure is not contained in the inner region of the Ground making the relation less "container-like" and highlighting the functional

features such as locational control (Coventry, Garrod 2004). Interlocking exhibits the strongest version of containment (Galton 2000) as the relation between the Figure and the Ground is conceived as a structured whole: if the Figure and the Ground must be separated, one's effort is needed and the whole is damaged. For the SUPPORT category, the support-from-below relation is a canonical one as the Figure and the Ground is in vertical alignment in which the Figure is a relatively movable object located on the surface of the relatively stationary Ground. In the rest of the SUPPORT subcategories, the movement of the Figure is restricted by fastening it differently to the Ground and changing the alignment. Adhesion requires the Figure to be directly stuck to the Ground, making the alignment irrelevant. Hanging covers rather different scenes, allowing various distances between Figure and Ground, but restricts their alignment. Encirclement is a very special case of support: it operates only when the Figure and the Ground is in contact and the Figure is a prolonged object surrounding the Ground.

28 additional pictures were filler-items, in which the Figure was a piece of clothing or adornment, whereas the Ground always was a human being or a body part. The scenes of clothing and adornment are a special case of spatial CONTAINMENT and SUPPORT relations, and they are quite different from the test stimuli since they might show impacts of animacy, such as

Table 4. **Example of each sub-category**

CONTAINMENT		
Full containment	**Partial containment**	**Interlocking**
		

SUPPORT			
Support-from-below	**Adhesion**	**Hanging**	**Encirclement**
			

alternative control (Feist 2000; among others). In addition, such scenes are distinguished for different linguistic behaviour when examined cross-linguistically, e.g., differential case marking (Creissels, Mounole 2011) or syntactic expression diverging from the Basic Locative Construction (Levinson, Wilkins 2006, 11, 16). For this reason, the fillers are excluded from consideration in this study and will be analysed separately.

The experiment started with 3 training items representing three highly unambiguous spatial scenes: a book on a table, a hat on a head and a poster on an advertising board. To avoid order effects, the rest of the stimuli were presented randomly for each participant.

3.2. Task design and procedure

The participants filled in an online questionnaire consisting of 66 picture-stimuli and a demographic part created with *QuestionPro*^{TM} tool. Under each picture, the participants were asked in their native language: "Write down briefly, where the object to which the arrow indicates is located". The Figure object thus was pointed to by an arrow whereas the Ground object was not indicated in any manner (cf. Landau et al. 2017) and the participants were expected to provide a Basic Locative Construction as the answer to the request (BLC, Levinson, Wilkins 2006). We have chosen an open-ended production task (Carlson, Hill 2003, 270) because we did not want to put any constraints upon the answers and, consequently, expected to avoid lexical influence as it is observed that the labelling of the Figure or especially the Ground object can influence spatial expression (Coventry et al. 1994; Feist, Gentner 2003). We have tried to use as unambiguous spatial scenes as we could.

Median time for completing the questionnaire was 22 minutes for Lithuanian participants, 23 minutes for Latvian participants and 17 minutes for Estonian participants (the mean time – 27, 28 and 22 minutes respectively).

All the results were manually coded in *Excel* and analysed using descriptive statistics tools.

3.3. Subjects

60 participants of each language (Lithuanian, Latvian and Estonian) were tested. Male / female distribution was almost equally balanced: 48% and 52% for LT, 50% and 50% for LV, 40% and 60% for Estonian (henceforth – EE). Figure 1 shows the participants' age range and distribution for each language.

Most of the participants have higher education (82% LT, 65% LV and 69% EE) which encompasses different fields: humanities, social sciences, natural

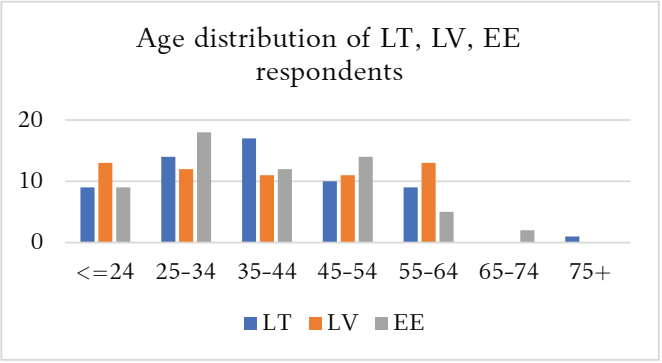


Figure 1. **Participants' age distribution**

sciences, engineering, agriculture, other areas. There were also Latvians and Estonians with pedagogical, medical or arts education, but these did not apply to Lithuanian participants.

Almost all of the participants were native speakers of the language in which they filled in the questionnaire: 98% Lithuanians, 95% Latvians and 98% Estonians. 3% of Latvians have indicated Russian and 2% indicated Estonian as their mother tongue whereas 2% of Lithuanian and Estonian subjects have not specified their native language (but it was not Russian as Russian was included as a separate option). English and Russian were the most well-spoken foreign languages in all three groups: LT 87% / 80%, LV 82% / 82%, EE 92% / 57%. The third foreign language was German for Lithuanians (10%) and Latvians (11%), but Finnish for Estonians (13%).

There were 2100 answers to *where*-questions provided in each language. We included into the analyses only the answers where the Figure and the Ground were recognized according to our task. Thus, the amount of valid data was 2 028 Lithuanian, 1 961 Latvian and 2 032 Estonian phrases (97%, 93% and 97% respectively).

4. Results and discussion

4.1. Overall construction in all three languages

The answers to *where*-questions are usually provided in a Basic Locative Construction or BLC which is "the construction used in the basic locative function" (Levinson, Wilkins 2006, 15ff.). In its full structure, the BLC

in all the three languages consists of a subject (noun or noun phrase), the predicate (finite form of the copula verb *be* or Latvian verb *atrasties* 'be located') and its complement, represented by oblique case or adpositional phrase. Therefore, a spatial Figure-Ground relationship in the scene *Apple in bowl* is marked in this way:

(21) Lithuanian *Obuol-ys* *yra* *ind-e.*
apple-NOM.SG be.3.SG bowl-LOC.SG

Latvian *Ābol-s* *atrod-a-s* / *ir* *bļod-ā.*
apple-NOM.SG be.located-PRS.3-RFL be.3.SG bowl-LOC.SG

Estonian *Õun* *on* *kausi-s.*
apple.NOM.SG be.3.SG bowl-LOC
'An apple is in a bowl.'

However, in most of the cases, the verb is simply omitted providing only the Ground lexeme used in a prepositional phrase or a spatial case. A locational verb in such cases can easily be implied. Such a strategy is common in all three languages: verb-less constructions dominate accounting for 87% Lithuanian, 76% Latvian and 81% Estonian responses. The responses contain a finite form of LT *būti*, LV *būt*, EE *olema* 'be' in 1%, 1% and 13% of the cases. A verb meaning 'to be located, to be situated' is absent in Lithuanian, but exists both in Latvian (*atrasties*) and Estonian (*asuma*). In Latvian, it is used more frequently than the verb *būt* 'be', but in Estonian it occurs only sporadically. Lexical verbs are not frequent, they usually appear together with specific orientational adpositions and determine the overall construction (active / passive / transitive). The distribution of verbs is provided in Table 6:

Table 6. **Verbs in responses to *where*-questions**

	Lithuanian	**Latvian**	**Estonian**
Verb-less responses	87%	76%	82%
Verbs 'be' (LT *yra*, LV *ir*, EE *on*)	1%	1%	13%
Verbs 'be located' (LV *atrodas*, EE *asub*)	-	4%	0%
Lexical verbs	12%	19%	5%

5.2. Containment

The meaning of functional containment and topological or geometrical inclusion in Lithuanian and Latvian is expressed with the Locative case. The same meaning is rendered by the Estonian Inessive. When expressing the three sub-types of the CONTAINMENT category, the LT and LV Locative and EE Inessive of the Ground object noun occur extremely frequently, but their distribution over the three types is quite different (see Table 7). For Latvian, the amount of the Locative in the Table 7 accounts for static contexts only as the Latvian Locative is also used in directional constructions.

Table 7. **Distribution of the Locative (Baltic) and Inessive (Estonian) for the subtypes of CONTAINMENT**

CONTAINMENT **subtypes**	**Lithuanian**	**Latvian**	**Estonian**
Full containment	96%	85%	72%
Partial containment	87%	82%	78%
Interlocking	83%	73%	57%

Further on we will describe each language separately and will highlight the commonalities and variation in expressing the CONTAINMENT category.

4.2.1. Lithuanian

In Lithuanian, full containment is almost always expressed with the Locative case (Table 8). The amount of the Locative gradually decreases for partial containment and interlocking, but is still significantly high. All responses containing the Locative case are verb-less (97%) or correlate with the copula verb *yra* 'is' (2%). When *yra* is used, the Figure is always explicit, e.g., *gėrimas yra stiklinėje* 'a drink is in a glass'.

Table 8. **Spatial grams for CONTAINMENT in Lithuanian**

CONTAINMENT **subtypes**	Locative	[*į* + Acc.] 'to'	*viduj(e)* 'inside'	[*iš* + Gen.] 'from'	*vidury(je)* 'in the middle'
Full containment	96%	2%	1%	-	-
Partial containment	87%	10%	2%	2%	-
Interlocking	83%	10%	6%	-	1%

Table 9. **Verbs for CONTAINMENT in Lithuanian**

CONTAINMENT subtypes	verb-less (90%)	*yra* (1%)	*lexical verbs* (9%)
Full containment	96%	1%	3%
Partial containment	86%	2%	12%
Interlocking	88%	1%	11%

All the subtypes of CONTAINMENT are also expressed employing the prepositional phrase [*į* + Acc.] 'to' which is dynamic counterpart of the Locative case; namely, it is used with verbs of motion and indicates the goal of motion inside the Ground. Full containment has only 2%, but for partial containment and interlocking, this preposition accounts for 10% of the cases. The preposition [*į* + Acc.] almost always (in 89% of the cases) is governed by the passive participles that are prefixal derivatives with the prefix *į-* 'into', such as *į-dė-t-as* [PVB-put-PST.PP-NOM.SG.M] 'put into', *į-jung-t-as* 'pluged into', *į-kal-t-as* 'stuck into', *į-kiš-t-as* 'inserted into', *į-leis-t-as* 'let into', *į-montuo-t-as* 'built-in', *in-krustuo-t-as* 'inlaid', *į-pil-t-as* 'poured into', *į-smeig-t-as* 'stuck into', *į-srieg-t-as* 'threaded into', *į-suk-t-as* 'screwed into'. The rest of the contexts (11%) contain the verbs with prefix *pa-*, namely, *pa-dė-t-as* [PVB-put-PST.PP-NOM.SG.M] 'placed', *pa-merk-t-as* 'soaked', *pa-staty-t-as* 'placed'. The overall construction is passive and directional, indicating the accomplished status of an action revealed by the verb. In such contexts, the preposition [*į* + Acc.] gains the meaning 'into', e.g., *peilis įsmeigtas į arbūzą* 'a knife is stuck into a watermelon'. There are only a few instances containing active voice (active past participle): *įsmigęs į arbūzą* '[a knife] has stuck into a watermelon', *objektas įsiskverbęs į arbūzą* 'an object has penetrated into a watermelon'.

It is worth mentioning the cases, though very few ones (6 instances only), where the above mentioned prefixed passive participles govern the Locative case instead of the prepositional phrase [*į* + Acc.], e.g., *muilas yra įdėtas muilin-ėje* (1x) 'soap is placed in a soap box', *pamerktas vaz-oje* (2x) '[flower is] soaked in a vase', *įmontuotas gintaro luit-e* (1x) '[watch is] built in a piece of amber', *įrėmintas gintaro gabal-e* (1x) '[watch is] framed in piece of amber', *įsuktas lent-oje* (1x) '[screw is] screwed in a board'. In these cases, the respondents highlight not the goal of motion of the verb, but the location of the Figure as a result of the completed action.[13]

[13] As already mentioned in the section 2.2, the alternation of the Locative case

All of the subtypes of containment are also expressed using *viduj(e)* 'inside' which functions as an adverb, a preposition governing the Genitive case or as the Locative case of relational noun *vidus* 'inner region' (e.g., *stiklinio rutulio viduje* 'inside the glass ball'). For interlocking, in addition to the highest amount of *viduj(e)* (6%), the middle region can occasionally be specified employing the Locative of relational noun *vidurys* 'middle', namely, *vidury(je)* 'in the middle'.

Partial containment has 2% of prepositional phrase [*iš* + Gen.] 'from inside' which indicates a source of motion. In such contexts, the Figure is conceptualized as emerging out of the Ground object and its location is characterised employing the verb *kyšoti* 'stick out' or active past participle forms of the verbs *išlįsti* 'get out' (*išlindęs / išlindusi*), *išsikišti* 'protrude' (*išsikišęs / išsikišusi*), e.g., *objektas išlindęs iš dėžutės* 'the object is protruding from the box'.

Most of the responses in the containment category are verb-less (90%, see Table 9). The verb *yra* 'is' occurs in 2% of the responses only, and the Figure object in these contexts is always explicit. Lexical verbs occur in 9% of the responses, almost always (7%) they have prefix *į-* 'into'. Compared to full containment, partial containment and interlocking are expressed using more different verbs that are also linked to a greater variety of spatial grams.

4.2.2. Latvian

Table 10. **Spatial grams for CONTAINMENT in Latvian**

CONTAINMENT subtypes	Locative	Locative (direction)	*iekšā*, [*iekš* + Gen.], *iekšpusē* 'inside'	*vidū, pa vidu, vidusdaļā* 'in the middle'	*centrā* 'in the centre'	*ārpus(ē), laukā, ārā, no* + Gen. 'from'
Full containment	85%	10%	4%	1%		-
Partial containment	82%	13%	2%	-		4%
Interlocking	73%	17%	8%	1%	1%	-

and prepositional phrase [*į* + Acc.] is described as depending on verbal semantics by Valiulytė (1998, 44–63). She also emphasizes that in contexts with the complex forms of certain verbs (passive voice or participles), the Locative is used because of the meaning of resulted action (LT *gramatinė rezultatinės būsenos reikšmė* (Valiulytė 1998, 62).

Table 11. **Verbs for CONTAINMENT in Latvian**

CONTAINMENT subtypes	verb-less (79%)	*atrasties* (5%)	*būt* (1%)	*lexical verbs* (15%)
Full containment	80%	7%	2%	10%
Partial containment	78%	6%	1%	16%
Interlocking	78%	3%	-	19%

The total amount of the Locative case for different types of CONTAINMENT are 95% for full containment, 95% for partial containment and 91% for interlocking. However, the constructions containing the Locative case in Latvian are polysemous. As already mentioned in the section 2.2, the Locative case in Latvian is prototypically used in static contexts and denotes inclusion and / or containment in the Ground object. Its dynamic counterpart is the prepositional phrase [*uz* + Acc.]. But [*uz* + Acc.] cannot be used in certain dynamic contexts since the Locative case as a marker of the Goal of motion is required. This applies to the contexts where the verbal complement denoting the goal of motion is governed by the verb with a prefix *ie-*, which implies that the motion is complete and the action has been accomplished, cf. (22) and (23):

(22) *Naz-is* ***arbūz-ā***.
knife-NOM.SG watermelon-LOC.SG
'Knife is in a watermelon.'

(23) *Naz-is* *(ir)* *ie-dur-t-s* ***arbūz-ā***.
knife-NOM.SG be.PRS.3 PVB-stick-PST.PP-NOM.SG.M watermelon-LOC.SG
'Knife (is) stuck into the watermelon.'

These responses also have different counterparts in Lithuanian – the Locative case and prepositional phrase [*į* + Acc.]. That is why the Locative case in Latvian is split into two categories: the Locative in static contexts and the Locative as a complement of dynamic verbs.

As already observed for Lithuanian, the amount of the Locative gradually decreases for partial containment and interlocking also in Latvian (85% / 82% / 73%). Both static and directional Locatives appear in verb-less contexts (in 93% of the cases) or with the verbs *atrasties* 'be located', *būt* 'be', *stāvēt* 'stand' (only one instance, for full containment). When the latter verbs are used, the Figure object is always explicit, e.g., *atslēga atrodas slēdzenē* 'the

key is located in the lock'. The number of the Locatives in static contexts slightly decreases from full containment to interlocking, but the number of the dynamic Locatives increases: they account for 10% / 13% / 17% of the spatial grams. Such a Locative is almost always governed by the passive participles with the prefix *ie-* 'into'. For full containment these verbs are *ie-lie-t-s* [PVB-pour-PST.PP-NOM.SG.M] 'poured into', *ie-lik-t-s* 'put into', *ie-sprosto-t-s* 'trapped into', *ie-vieto-t-s* / *no-vieto-t-s* 'placed into' (e.g., *kurpes ieliktas kastē* 'shoes are put into the box', *sula ielieta glāzē* 'juice is poured into a glass', *objekts ir novietots kastē* 'object is placed into a box'), for partial containment – *ie-cirs-t-s* 'notched', *ie-dur-t-s* 'pricked', *ie-lik-t-s* 'put into', *ie-locī-t-s* 'folded into', *ie-spraus-t-s* 'inserted', *ie-vieto-t-s* 'placed into' (*nazis ir iedurts arbuzā* 'knife is pricked into a watermelon', *dators ielikts somā* 'laptop is placed into a bag'), for interlocking – *ie-bāz-t-s* 'shove into', *ie-kausē-t-s* 'inserted', *ie-lik-t-s* 'put into', *ie-sis-t-s* 'struck into', *ie-skrūvē-t-s* 'screwed into', *ie-spraus-t-s* 'inserted into', *ie-štepselē-t-s* 'plugged in', *ie-stiprinā-t-s* 'mounted', *ie-strādā-t-s* 'built-in', *ie-tver-t-s* 'enclosed', *ie-vieto-t-s* 'placed into' (*skrūve ieskrūvēta dēlī* 'screw is screwed into a board', *lādētājs iesprausts kontaktligzdā* 'charger is inserted into socket').

For all the subtypes of CONTAINMENT, the inner region can be specified. LV prepositional phrase [*iekš* + Gen.] 'in', adverb *iekšā* and the Locative case of relational noun *iekšpuse* 'inner side' (*iekšpusē*) occur in 5% of the cases: *objekts atrodas sniega bumbas iekšpusē* / *iekš lodes* 'the object is inside the snowball'. *iekšā* often appears together with the Locative case emphasizing the inner part of the Ground, e.g.: *štepsel-ī iekš-ā* [socket-LOC.SG inside-LOC.SG] 'in the socket', *iekš-ā bumb-ā* 'in the ball', *iekš-ā stikla balon-ā* 'inside in the glass ball', *iekš-ā dzintar-ā* 'inside the amber', *dēl-ī iekš-ā* 'inside the board' etc. The interlocking has the largest amount of *iekšā* grams (8%). Occasionally, interlocking is also specified employing the Locative case of relational noun *centrs* 'centre', namely, *centrā* 'in the centre' (1%).

It is also worth mentioning a special construction for partial containment. Stimuli *Spoon in cup*, *Laptop in bag* and *Handkerchief in box* can be characterised emphasizing location in exterior region whether employing adposition *ārpus(ē)* 'outside' (24) or a source construction with the preposition [*no* + Gen.] 'from' (governed by *līst* 'get (out)', *izvilkt* 'pull out', *izņemt* 'take out') (25) and verb particles *laukā*, *ārā* 'out', e.g.:

(24) ***Ārpus*** *kast-es.*
outside box-GEN.SG
'[The handkerchief is] outside the box.'

(25) ***Lien*** ***ārā*** ***no*** *krūz-es.*
get.PRS.3 out from mug-GEN.SG
'(The spoon) is getting out from the mug.'

Partial inclusion otherwise is also specified by lexical means, such as *līdz pusei* 'till half' or *daļēji* 'partially':

(26) ***Līdz*** ***pus-ei*** *ie-locī-t-s* *kast-es* *caurum-ā,*
till half-DAT.SG PVB-fold-PST-PP-NOM.SG.M box-GEN.SG hole-LOC.SG
kur-š *atrod-a-s* *kast-es* *vid-ū.*
which-NOM.SG.M be.located-PRS.3-RFL box-GEN.SG middle-LOC.SG
'(The handkerchief is) half folded in a hole which is in the middle of the box.'

(27) ***Daļēj-i*** *ie-vieto-t-s* *som-ā.*
partial-ADV PVF-enclose-PST.PP-NOM.SG.M bag-LOC.SG
'(The laptop) is partially enclosed in a bag.'

The usage of verbs along all the three types also varies: from full containment to interlocking, the amount of verb-less responses and responses containing the verbs *atrasties* and *būt* decreases, but amount of lexical verbs increases, correlating with a larger variety of spatial grams (see Table 11).

4.2.3. Estonian

In Estonian, the Inessive is found not as often as in the Baltic languages: it accounts for 72% of the full containment, 78% of partial containment and 57% of interlocking. Interestingly, full containment is expressed using the Adessive case as well (16%, see Table 12). The usage of the Adessive is determined by the lexeme indicating the Ground object. The Adessive occurs only for the stimuli *Round candle in candle holder* and *Soap in soap container*. For candle holder, Estonians employ lexemes *küünlaalus*, *küünlaümbris*, *küünlahoidik*, *küünlahoidja* 'candleholder', *küünlajalg*, *küünlatops* 'candlestick' and *anum* 'container'. For the soap container, Estonians use lexemes *alus* 'vessel', *seebialus* 'soap dish' and *alustass* 'saucer'. Some of these lexemes (*küünlaalus*, *alus* and *alustass*) are used in the Adessive case despite of the concavity of the Ground object. Thus, the use of the Adessive case is determined by distributional knowledge and is lexeme dependent. In addition to the Adessive, some of these lexemes also occur with the postposition *peal* 'on'.

It is used to describe the stimulus *Soap in soap container* and accounts only for 1% of the full containment cases (e.g., *seep on (seebi)aluse peal*, *seebihoidja peal*).

Table 12. **Spatial grams for CONTAINMENT in Estonian**

CONTAINMENT subtypes	Inessive	Adessive / [Gen. + *peal*] 'on'	*sees*, [Gen. + *sees*] 'inside'	*väljas*, [Ela. + *välja*] 'out, outside'	[Gen. + *sisse*] 'into'	Illative
Full containment	72%	16% / 1%	12%	-	-	-
Partial containment	78%	-	20%	2%	1%	
Interlocking	57%		42%			1%

In addition to the Inessive case, *sees* (adverb or postposition) 'inside' occurs in 12% (full containment), 20% (partial containment) and 42% (interlocking) of the responses. For partial containment, the source construction with the Elative case (2%) or the goal construction with the postposition *sisse* 'into' (1%) can be employed, the latter emphasising the dynamic character of the action. For interlocking, the 1% of the short Illative forms is used (e.g., *kruuvitud lauda* 'screwed into the table').

Table 13. **Verbs for CONTAINMENT in Estonian**

CONTAINMENT subtypes	verb-less (83%)	*asuma*	*olema* (14%)	*lexical verbs* (3%)
Full containment	83%	-	15%	2%
Partial containment	83%	-	14%	3%
Interlocking	83%	0%	14%	3%

Interestingly, Estonian respondents do not use many types of verbs in their responses. Verb-less constructions dominate (83% in all the three types), the verb *on* 'is' is also distributed almost equally. When the verb *on* is used, the Figure is always explicit. Other verbs are hardly employed. For full containment, there are only 2% of lexical verbs (*seisma* 'stand', *lebama* 'lie', *vedelema* 'lie around') and they are complemented with the Inessive. For partial containment, lexical verbs appear in 3% of the cases only: *asetseb* 'is located' and *vedeleb* 'lies' are complemented by the Inessive, but other

verbs correlate with the other constructions, e.g., passive perfect participles *lööd*ud ‘nailed’, *surutud* ‘pushed’, *torgatud* ‘pierced’ require the short Illative or postposition *sisse* with the Genitive (28 and 29). Verb *tilpnema* ‘hang loosely’ is used in combination with the source construction consisting of postposition *välja* ‘out’ and the Elative case (30):

(28) *Nuga* *on* ***arbuusi*** *löö-dud*.
knife.NOM.SG be.PRS.3 watermelon.ILL.SG nail-PP
‘The knife is nailed into the watermelon.’

(29) *Nuga* *on* *torga-tud* ***arbuusi*** ***sisse***.
knife.NOM.SG be.PRS.3 pierce-PP watermelon.GEN.SG into
‘The knife is pierced into the watermelon.’

(30) *Salfrätik* *tilpne-b* ***karbi-st*** ***välja***.
handkerchief.NOM.SG hang-PRS.3SG box-ELA out
‘The handkerchief is loosely hanging out of the box.’

Interlocking also has only 3% of lexical verbs: in addition to *seisab* ‘stand’ and *asetseb* ‘is located’, participles *puuritud* ‘drilled’, *kruvitud* ‘screwed’, *lööd*ud ‘nailed’ are used, e.g.:

(31) *Kruvi* *on* ***lauda*** *puuri-tud*.
screw.NOM.SG be.PRS.3 table.ILL.SG drill-PP
‘A screw is drilled into the table.’

(32) *Kruvi* *on* *kruvi-tud* ***läbi*** ***laua***.
screw.NOM.SG be.PRS.3 screw-PP through table.GEN.SG
‘A screw is screwed through the table.’

(33) ***Laua*** ***sisse*** *löö-dud*.
table.GEN.SG into nail-PP
‘Hit into the table.’

4.2.4. Containment: cross-linguistic similarities and variation

The locative cases, namely, the Baltic Locative and Estonian Inessive, are the main means for expressing all the subtypes of containment. Its amount decreases along the subtypes (full containment > partial containment > interlocking). Estonian, however, shows an interesting peculiarity: full containment here is expressed with 16% of the Adessive and 1% of the postposition [Gen. + *peal*] ‘on’ which prototypically denote support via

Figure's location on a surface of the Ground. Occurrence of the latter constructions for the expression of full-containment is lexeme-dependent, since a concrete lexeme standing for the Ground object is more likely to appear in the Adessive, but not the Inessive case. Such a lexeme-dependent choice of grams for the Ground is possible in the Baltic languages as well, but it has not been attested for containment relations.

In all these languages, the Locative alternates with the means indicating the inner side of the Ground (relational nouns or postpositions), namely, LT *viduj*, LV *iekšā*, EE *sees*, and this alternation increases going from full containment to interlocking (Latvian 2% of INSIDE grams for partial containment is a minor exception). The most significant rise of INSIDE grams and decline of the Inessive is attested in Estonian. Thus, along the containment subtypes, Estonian expresses increasing control of the Ground over the Figure with the emphasis on INSIDE grams. The Baltic languages also adopt this strategy, but it is secondary compared to directional constructions. One of the main differences between Estonian and the Baltic languages is that in the Baltic languages, all the types of containment are expressed using directional construction indicating the movement into the Ground object; namely, the Lithuanian preposition [*į* + Acc.] and the Latvian Locative. Both of them correlate with the verb containing prefixes LT *į-* and LV *ie-*. Contrary, in Estonian corresponding means (the Illative case or postposition *sisse* 'into') appear only occasionally.

The last and minor yet interesting commonality is observed in the case of partial containment. In all three languages it can be expressed using a source construction (OUT OF, FROM) implying that the Figure is conceptualized as emerging from a container Ground (Table 14).

Table 14. **Spatial grams for CONTAINMENT**

CONTAINMENT **subtypes**	IN			ON	INSIDE			INTO			OUT OF		
	LT	LV	EE	EE	LT	LV	EE	LT	LV	EE	LT	LV	EE
Full containment	96%	85%	72%	17%	1%	4%	12%	2%	10%	-	-	-	-
Partial containment	87%	82%	78%	-	2%	2%	20%	10%	13%	2%	2%	4%	2%
Interlocking	83%	73%	57%	-	6%	8%	42%	10%	17%	-	-	-	-

One more important difference between the Baltic languages and Estonian is observed in the usage of the verbs (Table 15).

Table 15. **Verbs for CONTAINMENT**

CONTAINMENT subtypes	verb-less			BE			BE LOCATED			lexical verbs		
	LT	LV	EE	LT	LV	EE	LT	LV	EE	LT	LV	EE
Full containment	96%	80%	83%	1%	2%	15%	-	7%	-	3%	10%	2%
Partial containment	86%	78%	83%	2%	1%	14%	-	6%	-	12%	16%	3%
Interlocking	88%	78%	83%	1%	-	14%	-	3%	0%	11%	19%	3%

For the Baltic languages, the amount of verb-less responses decreases correspondingly leading to the increasing number of lexical verbs. The latter verbs trigger the usage of the spatial grams meaning INTO and OUT OF and thus changes the overall construction into directional or passive. In Estonian, expressions for CONTAINMENT are much more homogeneous. The amount of verb-less responses is stable for all the subtypes of containment (83%) and other verbs are also hardly used. It means that Estonian employs the Basic Locative Construction for all the three types of CONTAINMENT equally. This determines the lack of other verbs and constructions (such as directional or passive) and thus the absence of the verbal complements bearing the meaning INTO in Table 14.

4.3. SUPPORT

The SUPPORT domain is very heterogeneous (Levinson, Wilkins 2006; Gentner, Bowerman 2009; Landau et al. 2017). Four subtypes of support – support from below, adhesion, hanging and encirclement with contact – are expressed very diversely in all three languages and they will be described separately.

4.3.1. Lithuanian

In Lithuanian, all the aforementioned subtypes of SUPPORT have a very large number of the prototypical support preposition [*ant* + Gen.] 'on' which is used for both location and the goal of motion (Table 16).

Support-from-below has 99% of this preposition. The remaining 1% is expressed by the Locative case *lentyn-oje*, *kabykl-oje* 'in the shelf, in the hanger' or the Locative case of relation noun *viršus* 'top', namely, *virš-uje* 'on the top'. The Locative is attested only in responses to the stimulus *Helmet on rack* and it is lexeme-dependent since *lentyna* 'shelf' in Lithuanian can be

Table 16. **Spatial grams and verbs for SUPPORT in Lithuanian**

SUPPORT subtypes	[*ant* + *Gen.*] 'on'	[*prie* + *Gen.*] 'at'	[*apie*, *aplink* + Acc.] 'around'	[*po* + Instr.] 'under'	[*nuo*, *iš* + Gen.] 'from'	Locative	Verbs
Support-from-below	99%					1%	95% verb-less
Adhesion	91%	5%				3%	85% verb-less
Hanging	89%	2%		3%	2%		75% verb-less
Encirclement with contact	72%		11%			7%	80% verb-less

used employing both the prepositional phrase and the Locative case. Usually it depends on the shape of the shelf and in our case the shape infers a support preposition [*ant* + Gen.]. Nevertheless, the shape was not considered when the Locative *lentynoje* and *kabykloje* was used. 95% of the support-from-below responses are verb-less, the rest 5% consist of the verb forms *yra* 'is', *guli* 'lies', *pa-dė-t-as* 'placed', *už-dė-t-as* 'put on', *už-ties-t-as* 'laid on' and prepositional phrase [*ant* + Gen.].

The usage of [*ant* + Gen.] decreases along the subtypes of support, but it still remains the predominant means for adhesion (91%), hanging (89%) and encirclement (72%).

In addition to [*ant* + Gen.], **adhesion** has also 5% of preposition [*prie* + Gen.] 'at' which is almost always governed by the passive participles with the prefix *pri-* marking the perfective aspect and rendering the same spatial meaning as the preposition: *pri-klijuo-t-as* 'glued', *pri-lipdy-t-as*, *pri-lip-ęs* 'stuck', *pri-tvirtin-t-as* 'attached', e.g.:

(34) ***Pri**-klijuo-t-as* ***prie*** *kompiuteri-o* *ekran-o.*
PVB-glue-PST.PP-NOM.SG.M at computer-GEN.SG monitor-GEN.SG
'(Sticky note) is affixed to the monitor'.

The Locative case for adhesion appears in a few contexts (3%) when the exact part of the Ground is specified, e.g., *dešini-ame viršutini-ame voko kamp-e* '[a stamp is] in the right upper corner of the envelope' or *dešin-ėje pus-ėje* 'on the right side'. 85% of the utterances of adhesion are verb-less,

but 12% consist of typical adhesion verbs *pri-klijuo-t-as*, *už-klijuo-t-as, -a*, 'glued', *pri-lipdy-t-as*, *pri-lip-ęs* 'stuck', *pri-tvirtin-t-as* 'fastened, attached'. Verbs with the prefix *už-* always govern prepositional phrase [*ant* + Gen.] (see example 35), but *pri-* verbs appear with both [*ant* + Gen.] (14x, example 36) and [*prie* + Gen.] (14x, example 37) equally often, e.g.:

(35) *Juost-a* ***už**-klijuo-t-a* ***ant dėž-ės***.
tape-NOM.SG PVB-glu- PST.PP-NOM.SG.F on box-GEN.SG
'The sticky tape is put onto the box.'

(36) *Lipduk-as* ***pri**-klijuo-t-as* ***ant kompiuteri-o***.
sticker-NOM.SG PVB-glue- PST.PP-NOM.SG.M on computer-GEN.SG
'The sticker is glued onto the computer.'

(37) *Objektas* ***pri**klijuotas* ***prie voko***.
object-nom.sg PVB-glue- PST.PP-NOM.SG.M at envelope-GEN.SG
'The object is glued to an envelope.'

The remaining 3% of verbs are forms *yra* 'is', *einanti* 'going', *pakabintas ant durų* 'hung onto the door'.

Hanging is verb-less in 75% of the cases, but 23% has typical hanging verbs, such as *kabo / kaba* 'is hanging' (9%) and past passive participles of the verb *kabinti* 'hang': *pa-kabin-t-as*, *pri-kabin-t-as*, *už-kabin-t-as* (14%) 'hung'. The rest 2% consists of participles marking attachment (*pri-riš-t-as* 'tied', *pri-tvirtin-t-as* 'fastened') or verb forms *nu-leis-t-as* 'drawn down', *yra* 'is'. In addition to preposition [*ant* + Gen.], various other means are employed for hanging relations (see Table 16). The prepositional phrase [*prie* + Gen.] 'at' (2%) only occurs as a complement of verbal derivatives with the prefix *pri-*:

(38) *Objekt-as* *virv-e* ***pri**-riš-t-as*
object-NOM.SG rope-INST.SG PVB-tie- PST.PP-NOM.SG.M
prie *medži-o* *šak-os*.
at tree-GEN.SG branch-GEN.SG
'The object is tied with the rope to a tree branch.'

However, *pri-* verbs also govern other spatial grams:

(39) ***Pri**-riš-t-as* ***ant*** *šak-os* / ***už*** *šak-os*.
PVB-tie-PST.PP-NOM.SG.M on branch-GEN.SG behind branch-GEN.SG
'[The swings are] tied to the branch.'

The prepositional phrase [*po* + Instr.] 'under' is used when the respondents choose to indicate the Figure's location only, but not their functional interrelation, cf. *po šaka* 'under the branch' for the *Swings on branch* and *po lubomis* 'under the ceiling' for *Lamp on ceiling*. The two latter stimuli are also described employing the source prepositions *nuo* 'from the surface' or *iš* 'from inside' (2% of the cases):

(40) *Nu-leis-t-as* ***iš*** *lub-ų*.
PVB-draw_down-PST.PP-NOM.SG.M from CEILING-GEN.PL
'[The lamp] is drawn down from the ceiling.'

(41) *Lemp-a* *kab-o* ***nuo*** *lub-ų*.
lamp-NOM.SG hang-PRS.3 from ceiling-GEN.PL
'A lamp is hanging from the ceiling.'

Finally – the lamp from the ceiling is also expressed with the Locative of lexeme *palubė* (< prefix *pa-* 'under' + *lub-os* 'ceiling') 'a place near the ceiling, under the ceiling', namely, *palub-ėj*, *palub-ėje* (2%).

Encirclement-with-contact in 72% of the cases is expressed using the preposition [*ant* + Gen.]. It is almost always used in a verb-less construction (92%), but in the rest of the cases it is found with the verbs meaning *rišti* 'bind' (*ap-riš-t-as*, *su-riš-t-as*, *už-riš-t-as*), *vynioti* 'wrap' (*su-vynio-t-as*, *už-vynio-t-as*), verb forms *apsiraizgęs* 'twined', *auga* 'grows', *yra* 'is'. In 11% of the cases, encirclement prepositions [*apie* + Acc.] and [*aplink* + Acc.] 'around' are attested. In half of the cases they are governed by the verbal derivatives with the prefix *ap-* which imply both perfective aspect and encirclement: *ap-juos-t-as*, *ap-suk-t-as*, *ap-vynio-t-a* 'wrapped'. The Locative case accounts for 7% of responses and it is used when reacting to the stimulus *Thread around spool – siūlų rit-ėje / špūl-ėje*. This stimulus also has sporadic responses with the source construction [*iš* + Gen.], e.g.:

(42) *iš-sikiš-ęs* *iš* *rit-ės*.
PVB-protrude-PST.PA.NOM.SG.M from spool-GEN.SG
'[The thread is] protruding from the spool.'

80% of encirclement expressions are verb-less, 10% include different verbs with prefix *ap-* and 5% have *juosia* 'wraps, encircles'. The latter is used in transitive constructions, e.g.:

(43) *Diržas* *juosia* *lagaminą*.
belt-NOM.SG wrap-PRS.3 suitcase-ACC.SG
'The strap wraps a suitcase'.

Interestingly, transitive construction appears in 8% of the encirclement responses containing the verbs *juosia*, *apjuosia*, *apjuosęs*, *apsivijęs*, *apsivijusi*, e.g., *apsivijęs kamieną / medį / pušį* '[the bindweed] has twined the trunk / tree / pine'.

4.3.2. Latvian

In Latvian, the support preposition [*uz* + Gen.] 'on' occurs in 94% of the responses to **support-from-below** stimuli (see Table 17). The Locative is used in 5% of the cases (usually *plaukt-ā*, *gald-ā* 'on the shelf, on the table' showing the same lexeme-induced choice of the Locative as already mentioned for Lithuanian). In 84% cases, support-from-below responses are verb-less, *atrodas* 'is located' is used in 7% of the cases, past passive participles *no-lik-t-s* 'put', *no-vieto-t-s* 'placed' – 4%, *uz-klā-t-s*, *uz-lik-t-s* 'placed on top' – 3%, the rest of the verbs being *ir* 'is', *stāv* 'is standing', *redzams* 'is seen', *gozējas* 'is wallowing'.

Table 17. **Spatial grams and verbs for SUPPORT in Latvian**

SUPPORT subtypes	[*uz* + Gen.] 'on'	[*pie* + Gen.] 'at'	[*ap* + Acc.], [*apkārt* + Dat.] 'around'	[*pāri* + Dat.]	Dat.	Loc.	Verbs
Support-from-below	94%					5%	84% verb-less
Adhesion	62%	22%		1%	5%	9%	77% verb-less
Hanging	26%	36%				35%	63% verb-less
Encirclement with contact	19%	3%	59%	1%	3%	8%	68% verb-less

For **adhesion**, the frequency of [*uz* + Gen.] 'on' decreases (62%) and consequently prepositional phrase [*pie* + Gen.] 'at' occurs in 22% of the cases. In 5% of the cases, a spatial construction with the Dative is used and the Dative is almost always governed by the deverbal derivative with prefix *pie-*, e.g.:

(44) *Objekt-s* ***pie**-stiprinā-t-s* *ledusskapj-a* ***durv-īm***.
object-NOM.SG PVB-attach-PST.PP-NOM.SG.M fridge-GEN.SG door-DAT.PL
'The object is attached to the refrigerator door.'

The Locative (9%) for adhesion is used when the respondents choose to specify the exact side or part of the Ground object, namely, for the stimulus *Stamp on envelope* participants specify that a postmark is glued in the corner of the envelope. The same feature is observed in Lithuanian as well. Finally, in 1% of the cases, preposition [*pāri* + Dat.] 'over' is used which always occurs as a complement of prefixal derivatives with the prefix *pār-*.

77% of responses for adhesion are verb-less. 15% of the verbs have prefix *pie-* which also implies adhesion and attachment, namely, *pie-guļ*, *pie-lik-t-s* 'attached', *pie-līmē-t-s* 'glued', *pie-lipinā-t-s* 'adhered', *pie-lip-is* 'stuck', *pie-spraus-t-s* 'pinned', *pie-stiprinā-t-s* 'affixed'. The verbs with the prefix *pie-* are most often complemented with the preposition [*pie* + Gen.] (in 58% of the cases), the Dative (28%) or the preposition [*uz* + Gen.] 'on' (14%).

For **hanging**, [*uz* + Gen.] is used only in 26% of the cases, leaving the place for the prepositional phrase [*pie* + Gen.] 'at' (36%) and the Locative (35%). 63% of the responses are verb-less, but 2% have *atrodas* 'is located'. Verb *karājas* 'is hanging' occurs in 3% of the cases, and passive participles *pa-karinā-t-s*, *pa-kār-t-s* 'hung' are used in 8% of the responses. Verbal prefixes often correlate with the spatial grams. For example, prefixed past participles *ie-karinā-t-s*, *ie-kār-t-s* 'hung' are used in 16% of the cases and always require the Inessive. Verbs with the prefix *pie-* (*pie-karinā-t-s*, *pie-kār-t-s* 'hung', *pie-lik-t-s* 'attached', *pie-stiprinā-t-s* 'affixed') are used in 6% of the cases and correlate with the preposition [*pie* + Gen.]. Verbs with the prefix *pa-* govern all three hanging grams:

(45) ***Pa**-kār-t-s* *kok-a* ***zar-ā***.
PVB-hang-PST.PP-NOM.SG.M tree-GEN.SG branch-LOC.SG
'[The swings are] hung into the branch.'

(46) ***Pa**-kār-t-s* ***uz*** *kok-a* ***zar-a***.
PVB-hang-PST.PP-NOM.SG.M on tree-GEN.SG branch-GEN.SG
'[The swings are] hung on the branch.'

(47) ***Pa**-kār-t-s* ***pie*** ***griest-iem***.
PVB-hang-PST.PP-NOM.SG.M at ceiling-DAT.PL
'[The lamp is] hung on the ceiling.'

Finally, **encirclement** has the least number of the support preposition [*uz* + Gen.] (19%), but it is most often expressed using the encirclement preposition [*ap* + Acc.] 'around' (59%). The Locative occurs in 8% of the cases and is mostly used to describe the stimulus *Thread around spool*: *spol-ē*, *spolīt-ē*, *rullīt-ī* [spool-LOC.SG], *diegs uztīts / satīts spol-ē* 'thread is wound to the spool'. Preposition [*pie* + Gen.] (3%) is attested in the responses to the stimuli *Bindweed around tree* (*pie koka* 'at the tree'), *Strap around suitcase* (*pie kofera* 'at the suitcase', *pie somas* 'at the bag') and *Thread around spool* (*pie spoles* 'at the spool'). The latter is rather ambiguous as most likely it marks proximity instead of encirclement or attachment (the thread was a little separated from the spool in the picture). In 3% of the cases the Dative is found as a complement of prefixed verbs (see also example 18), e.g.:

(48) ***Ap**-tī-t-s //* ***ap**-sie-t-s* *dāvan-u* ***kast-ei***.
PVB-wind bind-PST.PP-NOM.SG.M gift-GEN.PL box-DAT.SG
'[The object is] wound / bound around the gift box.'

In 2% of the cases, the transitive construction is used (the same tendency for encirclement is attested in Lithuanian as well). In transitive constructions, the verb is always a prefixal derivative with the prefix *ap-*, e.g.:

(49) *Čemodān-u* ***ap**-jož* *tumš-a* *plat-a siksn-a*.
suitcase-ACC.SG PVB-belt-PRS.3 dark-NOM.SG.F wide-NOM.SG.F strap-NOM.SG
'The wide dark strap wraps the suitcase.'

(50) *Objekt-s* ***ap**-vij* *kok-u*.
object-NOM.SG PVB-twine.PRS.3 tree-ACC.SG
'The object [bindweed] twines around the tree.'

Encirclement has also other variations, such as source construction (*attinies no spoles* 'unfolded from the spool'), but it is very marginal.

68% of the encirclement responses are verb-less, but 24% have verbs with the prefix *ap-* denoting wrapping or belting (*ap-jož*, *ap-jos-t-s*, *ap-lik-t-s*, *ap-sie-t-s*, *ap-tin-ies*, *ap-tī-t-s*, *ap-vij*, *ap-vij-ies*, *ap-vī-t-s*) which almost always is complemented with the preposition [*ap* + Acc.] 'around'. In 4% of the cases verbal derivatives with the prefix *uz-* are used (*uz-tī-t-s* 'wound', *uz-sie-t-a* 'bound'), which may govern the Locative, the Dative and [*uz* + Gen.], e.g.:

(51) *Dieg-s* *(ir)* ***uz-tī-t-s*** ***uz*** ***spol-es***.
thread-NOM.SG be.PRS.3 PVB-wind-PST.PP-NOM.SG.M on spool-GEN.SG

(52) *Dieg-s* ***uz-tī-t-s*** ***spol-ei***.
thread-NOM.SG PVB-wind-PST.PP-NOM.SG.M spool-DAT.SG

(53) *Dieg-s* ***uz-tī-t-s*** ***spol-ē***.
thread-NOM.SG PVB-wind-PST.PP-NOM.SG.M spool-LOC.SG
'The thread is wound on the spool.'

4.3.3. Estonian

In Estonian, there are two means for expressing support: the Adessive case and postposition *peal* with the Genitive case 'on'. They can be used interchangeably, but their distribution exhibits the preference for the Adessive (Table 18). If taken together, these two means account for 97% of support from below, 80% of adhesion, 24% of hanging and 27% of encirclement responses.

Table 18. **Spatial grams and verbs for SUPPORT in Estonian**

SUPPORT subtypes	Adessive	[Gen. + *peal*] 'on'	Allative	[Gen. + *küljes*] 'at'	[Gen. + *otsas*] 'at the end'	[Gen. + *ümber*] 'around'	Inessive	Verbs
Support-from-below	80%	17%					7%	84% verb-less, 15% *on* 'is'
Adhesion	52%	28%	1%	14%		2%	4%	84% verb-less, 12% *on* 'is'
Hanging	21%	3%		21%	13%		40%	73% verb-less, 10% *on* 'is'
Encirclement with contact	19%	8%		6%		57%	8%	81% verb-less, 13% *on* 'is'

The Inessive appears in all the subtypes of the support category. For **support-from-below**, it is lexeme dependent. As already seen for the Baltic languages, the location in the shelf can be described using both containment and support means. The same is observed in Estonian since *riiul* 'shelf' is used employing three means: [*kiiver on*] *riiuli-l* [shelf-ADE.SG], *riiuli pea-l*

[shelf-GEN.SG on] 'on the shelf' and *riiuli-s* [shelf-INE.SG] 'in the shelf'. A large amount of the Inessive occurs for the stimulus *Carpet on floor* when the participants chose a lexeme *maa* 'ground' to name the Ground object as it is used only in the Inessive case: *vaip on maa-s* 'the carpet is on the ground'. But if the lexeme *põrand* 'floor' is chosen, then the Adessive or postposition [Gen. + *peal*] are used (*vaip on põranda-l* or *vaip on põranda peal* 'on the floor').

Adhesion in 80% of the cases is expressed employing prototypical support means, but in the rest of the cases, the postpositional phrase [Gen. + *küljes*] 'at', the Inessive and ambiposition *ümber* 'around' are used. [Gen. + *küljes*] is used for all the adhesion stimuli except *Stamp on envelope*. The Inessive occurs in the cases when the respondents specify the exact side of the Ground-object, e.g.:

(54) *Külmkapimagnet* *on* *külmkapiukse* *välimise-l*
fridge-magnet.NOM.SG be.PRS.3 fridge-door.GEN.SG outer-ADE
külje-l, *parempoolse-s* *serva-s*.
side-ADE right-side-INE edge-INE
'The fridge magnet is on the outer sidewall, on the right side.'

Ambiposition *ümber,* which primarily indicates encirclement, is used only for the stimulus *Tape on box*: *ümber kasti* / *kasti ümber* 'around the box'. Thus, the tape is seen as a prolonged object belting the box.

For the **hanging** subcategory, the amount of support grams substantially decreases (24%) showing the predominance of the Inessive (40%). It is mostly used for describing two stimuli: *Lamp on ceiling* and *Bag on hook*: *lae-s* [ceiling-INE] (*lamp on* / *ripub lae-s* 'the lamp is / is hanging from the ceiling') and *nagi-s* [hook-INE] (*varna-s* [peg-INE], *kott on* / *ripub nagi-s* 'a bag is / is hanging on a hook').

[Gen. + *küljes*] 'at' is employed for *Swings on branch* / *tree* (*oksa küljes*, *puu küljes*) and for *Pendant on chain* (*keti küljes*). The latter stimulus also has a large amount of [Gen. + *otsas*] 'at the end': *(ripub) keti* / *paella* / *kaelakee otsas* '(is hanging) on a chain / ribbon / necklace'. Several cases of [Gen. + *otsas*] are attested for *Bag on hook* (*nagi otsas*, *konksu otsas*) and *Swings on branch* as well (*puu otsas*).

Encirclement is mostly expressed employing the ambiposition *ümber* 'around' (57%). The Adessive and [Gen. + *peal*] account for 27% of the cases

only. The Inessive occurs only in responses to the stimulus *Thread around spool*: *rulli-s*; *kera-s*; *niit on niidirulli-s*. The postposition [Gen. + *küljes*] is used for the stimuli *Bindweed around tree* (*puu küljes*) and *Strap around suitcase* (*kohvri küljes*). In 1% of the responses, the participants chose to use a transitive construction with the verb *siduma* 'bind, tie':

(55) *Roheline* *lehviku-ga* *lint* *seo-b* *pappkarpi.*
green.NOM.SG bow-COM ribbon.NOM.SG tie-PRS.3.SG paper-box.PRT.SG
'A green ribbon with a bow ties a paper box.'

(56) *Püksirihm* *seo-b* *sumadani.*
belt.NOM.SG tie-PRS.3.SG suitcase.PRT.SG
'A strap wraps a suitcase.'

Interestingly, most of the Estonian responses are verb-less or contain the locational verb *on* 'is', while other types of verbs are hardly used. For support from below, few responses contain verbs *lebab* 'lies', *seisab* 'sits' and *vedeleb* 'lies around'. Adhesion has occasional uses of *asub* 'is located', *asetseb* 'stands', *seisab* 'sits' and 2% of passive participle *kleebitud* 'glued' (*kleepima* 'glue'), the latter governing the Allative case or adposition *piki* 'along' with the Partitive:

(57) *Silt* *on* *kleebi-tud* *arvuti-le.*
note.NOM.SG be.PRS.3 stick-PP laptop-ALL
'Sticky note is attached to the laptop.'

(58) *Kleeplint* *on* *kleebi-tud* *piki* *pappkasti*
tape.NOM.SG be.PRS.3 stick-PP along paper.box.GE
ülemi-st *keskosa.*
upper-ELA centre.side-PRT
'The adhesive tape is pasted along the top centre of the cardboard box.'

Hanging has a large amount of *ripub* 'is hanging' (16%) and a few participles of verb *kinnitama* 'attach, stick, glue' with postposition *külge* 'at':

(59) *Seina* / *puu* *külge* *kinnita-tud.*
wall.GEN.SG tree.GEN.SG to attach-PP
'Attached to the wall / tree.'

Encirclement has the largest variation of verbs. Some of them bear the meaning of encirclement (*mähitud* 'wrapped around', *keritud* 'wound

around', *väändunud* 'bent', *seotud* 'bound', *seob* 'binds' [the latter in transitive constructions only]), but others are used to describe activity of the Figure, e.g., *roomab* 'crawls', *kasvab* 'is growing', *kasvanud* 'grown' are employed to describe the stimulus *Bindweed around tree*. The greater variety of verbs determines larger diversity of spatial grams, but such constructions occur rather sparsely, cf.:

(60) *Pooli-l / keri-tud ümber pooli.*
spool-ADE wind-PP around spool.GEN.SG
'[The thread is] on the spool, wound around the spool.'

(61) *Niit on keri-tud niidirulli.*
threat.NOM.SG be.PRS.3 wind-PP spool.ILL.SG
'The thread is wound onto the spool.'

(62) *Taim rooma-b mööda männatüve.*
plant.NOM.SG crawl-PRS.3.SG along stem.PART.SG
'The plant crawls along the pine stem.'

(63) *Nöör on seo-tud lillevar-te-le.*
string.NOM.SG be.PRS.3 tie-PP flower.stalk-PL-ALL
'The string is tied onto the flower stalks.'

4.3.4. SUPPORT: cross-linguistic similarities and variation

The results of support stimuli show that the basic subcategory of SUPPORT, namely, support from below, has comparatively the smallest variation in responses (Table 19). In all three languages ON grams are used: LT [*ant* + Gen.], LV [*uz* + Gen.] and EE Adessive or postposition [Gen. + *peal*] (the

Table 19. **Spatial grams for SUPPORT**

SUPPORT	ON			AT			AROUND			IN		
subtypes	LT	LV	EE	LT	LV	EE	LT	LV	EE	LT	LV	EE
Support-from-below	99%	94%	97%	-	-	-	-	-	-	1%	5%	7%
Adhesion	91%	62%	80%	5%	22%	14%	-	-	2%	3%	9%	4%
Hanging	89%	26%	24%	2%	36%	34%	-	-	-	-	35%	40%
Encirclement with contact	72%	19%	27%	-	3%	6%	11%	59%	57%	7%	8%	8%

sum of the latter two is provided in the Table 19). In addition to ON grams, the Baltic Locative and Estonian Inessive are used, but they occur as lexeme-dependent only. In all three languages, they appear when indicating location on the shelf (LT *lentyn-oje*, LV *plaukt-ā*, EE *riiuli-s*), in Latvian – also on the table (*gald-ā*), in Estonian – on the ground (*maa-s*).

For adhesion, the ON grams remain predominant, but AT grams also are employed indicating attachment onto the Ground. In the Baltic languages, AT grams appear as complements of the deverbal prefixal derivatives. In Lithuanian, verbal prefix *pri-* correlates with the preposition [*prie* + Gen.], but Latvian verbal prefix *pie-* correlates with the preposition [*pie* + Gen.]. The Locative case in the Baltic languages and the Inessive in Estonian appear only if the respondents chose to specify the exact region of the Ground object (in the corner etc.).

Hanging and encirclement reveal a divergence of the Baltic languages. Prototypical support preposition [*ant* + Gen.] 'on' remains the main means for these subcategories in Lithuanian, but its Latvian counterpart [*uz* + Gen.] 'on' is used only in 26% of responses of the hanging subtype and 19% of responses of the encirclement subtype. These numbers are very close to the amount of Estonian expressions of the corresponding subcategories, namely 24% for hanging and 27% for encirclement.

In both Latvian and Estonian, hanging is expressed with a large number of AT and IN grams. When AT grams are used, the meaning of attachment in the hanging situation comes to the fore. In Estonian, AT meaning (34%) is conveyed with two postpositions, namely, [Gen. + *küljes*] 'at' (21%) and [Gen. + *otsas*] 'at the end' (13%) showing more fine-grained structuring of attachment. IN meaning is rendered with the Latvian Locative and Estonian Inessive. Interestingly, in both languages, IN grams are used to describe different stimuli: mostly for *Pendant on chain* and *Swings on branch* in Latvian and for *Lamp on ceiling* and *Bag on hook* in Estonian.

For encirclement, Latvian and Estonian employ a large number of AROUND grams (59% and 57%, respectively), highlighting the encirclement relation, while in Lithuanian it remains a simple support relation (72% of [*ant* + Gen.] 'on' and only 11% of AROUND grams). The Inessive in all three languages appears in the responses of the stimulus *Thread around spool*.

The usage of verb-less constructions decreases along the subcategories: expressions of support-from-below do not vary much in this respect (Table

20). For adhesion and hanging, participants specify the way the Figure is affixed to the Ground in a verbal slot, predetermining the variety of spatial orientational grams. Encirclement exhibits a slight increase of verb-less responses. Lexical verbs are often deverbal prefixal derivatives; their prefixes usually correlate with corresponding spatial grams.

Table 20. **Verbs for SUPPORT**

SUPPORT subtypes	verb-less			BE			BE LOCATED			*lexical verbs*		
	LT	LV	EE	LT	LV	EE	LT	LV	EE	LT	LV	EE
Support-from-below	95%	84%	84%	2%	1%	15%	-	7%	-	3%	7%	1%
Adhesion	85%	77%	84%	1%	1%	12%	-	2%	1%	14%	20%	3%
Hanging	75%	63%	73%	-	-	10%	-	2%	-	25%	34%	17%
Encirclement with contact	80%	68%	81%	1%	1%	13%	-	1%	-	19%	29%	6%

Nevertheless, in the usage of verbs, Estonian is quite different from the Baltic languages. The reduction of the amount of verb-less constructions is minor along the subtypes (except for hanging). In addition, the copula *on* 'is' occurs more frequently than in the Baltic languages. Consequently, lexical verbs are hardly used. The hanging category has 17% of lexical verbs, but they do not vary: *ripub* 'is hanging' is used in 16% of the cases. Encirclement has the largest variety of verbs, but they constitute only 6% of the cases.

When the lexical verbs are used, the construction in the response varies. All the languages exploit passive constructions in all the subtypes (except for support-from-below in Estonian). Encirclement is expressed with the transitive construction (8% LT, 2% LV and 1% EE). For adhesion and encirclement, Latvian employ the constructions with the Dative.

5. Conclusion

The results of this research show that specific subtypes of complex conceptual categories of CONTAINMENT and SUPPORT are expressed differently both language-internally and cross-linguistically. The core subtypes of these categories, namely, full containment and support-from-below, are rendered most unambiguously. Most often these subcategories are described with Basic Locative Construction, employing the prototypical means for containment and support, and using the least spatial grams and verbs. In line with the

arguments developed in Žilinskaitė-Šinkūnienė et al. (2019), we might argue that gravitational support has a somewhat foundational cognitive prominence and has the strongest and least ambiguous profile of verbalization if compared to other type of relations.

The expressions of other subcategories exhibit more intralinguistic details and variation in all three languages. Those are triggered by a necessity to specify a particular Figure-Ground orientation and stronger force-dynamic interaction. It is especially obvious for the SUPPORT subcategories other than support-from-below, because Latvian and Estonian employ a wide range of expressions. Compared to Latvian, Estonian has even more internal variation in SUPPORT grams. Estonian exploits functional equivalents, namely spatial cases alternate with postpositions (e.g., the Adessive and [Gen. + *peal*]), and it also employs more spatial grams showing more fine-grained distinctions (e.g., AT grams [Gen. + *küljes*] 'at, by' and [Gen. + *otsas*] 'at the end, at the top'). In addition, Estonian has the largest number of lexeme-dependent spatial expressions, viz., those depending on shared knowledge of the speech community and reflecting distributed knowledge.

In relation to the usage of spatial grams, the Baltic languages share a lot of similarities in their expression of CONTAINMENT, but spatial grams for SUPPORT are strikingly similar in Latvian and Estonian. In a cross-linguistic perspective, when expressing the SUPPORT category, Latvian and Estonian exhibit even more variation than Dutch or German, which are considered the most "exotic" ones in structuring of SUPPORT (cf. Gentner, Bowerman 2009, 470).

When the usage of verbs is considered, the Baltic languages share more commonalities. In both Lithuanian and Latvian, the number of lexical verbs increases along the subcategories and they often determine the spatial gram in which the Ground object is coded. Preverbs semantically agree with prepositional phrases whether conveying the same spatial meaning or adding an additional component, and thus show the distributed spatial semantics (Sinha, Kuteva 1995). In Estonian, however, lexical verbs are not frequent. For this reason, the Basic Locative Construction is more common for all the subcategories and the difference between the subcategories within a single type is smaller than in the Baltic languages.

The cross-linguistic variation in carving the semantic space of CONTAINMENT and SUPPORT brings us back to the question of impact of geometry and function

for spatial language. CONTAINMENT and SUPPORT are expressed employing so-called functional prepositions (Landau 2017), which usually vary cross-linguistically (Landau 2017; Levinson, Wilkins 2006). The present research confirms this thought by showing how differently the speakers of three languages interpret the containment or support relations between specific Figures and Grounds in everyday spatial scenes. If we compare these results to our previous research of containment and support relations in geometric framework (RCC+F), the latter indicates the opposite tendency by showing a geometrically constrained and limited variation of the Baltic languages (Žilinskaitė-Šinkūnienė et al. 2019).

TALPYKLOS IR ATRAMOS SANTYKIŲ RAIŠKA LIETUVIŲ, LATVIŲ IR ESTŲ KALBOSE

Santrauka

Straipsnyje aprašoma semantinių talpyklos ir atramos kategorijų raiška lietuvių, latvių ir estų kalbose. Kalbos vartojamos tame pačiame areale, bet tik dvi pirmosios yra genetiškai susijusios. Tiriamųjų kalbų duomenys yra gauti atlikus eksperimentą (produkcijos užduotis, 60 kiekvienos kalbos dalyvių), kurio metu dalyviai turėjo aprašyti objektų padėtį nuotraukose, vaizduojančiose pagrindinius talpyklos ir atramos potipius. Talpyklos kategoriją sudarė pilno talpinimo, dalinio talpinimo ir sukibimo subkategorijos, o atramos – horizontalios atramos, prilipimo, kabėjimo ir apjuosimo su sąlyčiu subkategorijos. Rezultatai rodo, kad geriausiai talpyklos ir atramos kategorijas reprezentuoja pilnas talpinimas ir horizontali atrama – pastariesiems potipiams apibūdinti pasitelkiama mažiausiai kalbinių priemonių, jos neįvairuoja, o kitiems potipiams būdingas raiškos heterogeniškumas. Palyginus visų trijų kalbų duomenis matyti, kad baltų kalbos talpyklą vardija labai panašiai, o atramos raiškos priemonės artimesnės latvių ir estų kalbose. Tyrimas suteikia papildomų duomenų apie semantinius baltų kalbų skirtumus ir išryškina latvių kalbos ypatybes, atsiradusias dėl kontaktų su estų kalba.

ABBREVIATIONS

1, 2, 3 – first, second, third person
ABL – Ablative
ACC – Accusative
ADE – Adessive
ADV – adverb
ALL – Allative
COM – Comitative
DAT – Dative
DEF – definite
DEM – demonstrative
DIM – diminutive
EE – Estonian
ELA – Elative
EVD – evidential
F – feminine
FIN – Finnish
FUT – future
GEN – Genitive
IDEF – indefinite
ILL – Illative
IMP – impertative
INE – Inessive
INSTR – Instrumental
INT – interrogative pronoun
INTJ – interjection
LOC – Locative
LT – Lithuanian
LV – Latvian
M – masculine
MS – manuscript
NA – non-agreement, neutral
NEG – negation
SG – singular
PA – active participle
PL – plural
PP – passive participle
PRS – present
PRT – Partitive
PST – past
PTC – particle
PVB – preverb
RFL – reflexive
VEP – Veps
VOT – Votic

SOURCES

CCLC – *Corpus of the contemporary Lithuanian language*, http://tekstynas.vdu.lt/tekstynas/.

LILA – *Lithuanian-Latvian-Lithuanian parallel corpus*, http://lila.korpuss.lv.

LVK2018 – *Corpus of contemporary Latvian,* http://www.korpuss.lv/id/LVK2018.

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