John Benjamins Publishing Company

The diffusion of impositional innovations in the Estonian object-marking system*

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This study aims to specify to what extent the variation introduced in the Estonian object-marking system by Russian-dominant Estonian L2 speakers is spreading to the native usage of Estonian. 669 secondary school students completed a written production task and a grammaticality judgment task on object marking. The results indicate that the object-marking variation is contact-induced and that the group of fluent bilinguals acts as a bridge for impositional innovations to enter and to be accepted by native speakers. The findings also suggest that multiple causal forces influence the diffusion of innovations. While any single causal factor may drive diffusion if it is strong enough, the process is greatly facilitated when different causal factors contribute to the same direction. In this case, fairly weak contact is sufficient to induce diffusion.

Keywords: language contact, language change, substrate, morphosyntax, Estonian, self-organisation, fractals

1. Introduction

The impact of language contact on language change is a topic of considerable scholarly interest and controversy. The current paper scrutinizes the mechanism of one particular type of contact-induced change — imposition, a type of change initiated by L2 speakers and assumed to be the primary source of substrate influences on language (see Winford 2005). The main task of this study is to specify how and under what conditions the innovations produced by L2 speakers find their way into the usage of L1 speakers, i.e. how impositional innovations diffuse. The data for this study comes from Estonian object case marking, which is

fairly complex and produces difficulties for L2 learners. Therefore, impositional errors/innovations of object marking are common in L2 usage of Estonian. As the analysis will show, native speakers' patterns mirror L2 usage, but on a considerably smaller scale and not in all features.

The first section of the paper presents some theoretical preliminaries on contact-induced change and change in general. The second section provides an overview of the Estonian object case marking system, the design of data elicitation tasks and the sampling principles. The third section presents the results of the study: an overview of observed results, the construction and validation of summary scales and an analysis of the three main patterns of innovations: overuse of the partitive (PartTrend), overuse of the genitive (GenTrend), and overuse of the nominative (NomTrend).

The discussion section deals with the implications of this study for understanding contact-induced change. Three phenomena are discussed: the role of language contact in causing analogical changes; the interconnectedness of impositional and adaptational innovations and the role of fluent bilinguals in facilitating the diffusion of innovations over the speech community border; and the role of linguistic constraints in the rejection of contact innovations in L1 usage.

2.   Theoretical background

The current study relies on the assumption that language change is a process of emergence and diffusion of an innovation in a population of language users. This idea is central in theories of language change that see language change as a self-organisational (Ehala 1996, Keller 1994), evolutionary (Croft 2000) or epidemiological process (Enfield 2003, 2008, Mufwene 2001). In these paradigms, the main carrier of change is the individual user who is the source, adopter and diffuser of innovations, as well as the reproducer of established patterns. Language structures are emergent phenomena from usage and, when usage changes, different structures emerge (Ehala 1996, Kretzschmar 2009).

As all change is assumed to emerge from a deviation from existing patterns of linguistic behavior, the understanding of the diffusion of deviant forms is of primary importance to understanding language change. For example, an innovative feature x that is produced once by one single user is unlikely to become accepted by the whole speech community unless it is socially very contagious (on this notion, see Burt 1987, Hatfield, Cacioppo & Rapson 1993). An innovative feature y that is produced by 10,000 users who do not have mutual contact, but are simultaneously the sources of the same innovation, needs to be less contagious to become accepted by the speech community. The contagiousness of innovative features may

depend on various social and/or functional properties associated with these features, as well as structural analogies between the source and target languages, in the case of contact innovations. A good example of this difference is provided by adaptational and impositional innovations.

While the adaptational innovations are evidently contagious because of the very fact that the target language users adopt them from another language, it is not so evident in the case of impositional innovations. In a language shift setting, shifting source language speakers produce impositional innovations, but there is apparently little motivation for dominant language speakers to adopt these features, as they are often associated with the identity of the shifting group. Thus, impositional innovations seem to be less contagious than adaptational ones.

In fact, there is plenty of evidence for impositional features becoming characteristic features in the variety of shifted speakers, but there is far less evidence of such features spreading to the dominant language variety. A possible path for such a transition is suggested by Salmons & Purnell (2010): in the first stage impositional features are established as ethnolectal features; a generation or two later, they may lose their ethnic connotation and become regional features which, in the case of a possible koineization, may be taken over into the inventory of the emerging koine.

This scenario suggests that a successful imposition is not a single change, but a cascade of micro changes over a considerable time period, leading in one direction. Each of the micro changes in the cascade has some probability of occurrence, and there is no guarantee that all of them will ever be completed. Actually, if language change is a self-organizing phenomenon, a macro change that is the primary object of study in historical linguistics is not an atomic phenomenon, but a complex cascade of micro changes manifesting 'post hoc' as macro change (Ehala 1999).

In this sense, language change has a fractal structure. Evidence for this can be found in works on dialect geography, lexical diffusion, grammaticalisation and language variation in social networks. For example, Kretzschmar (2009), using *Linguistic Atlas of the Middle and South Atlantic States* data, argues that linguistic features do not pattern into a neatly bounded areas but are distributed in a very complex ways both geographically and socially when we zoom in on data. Yet as is characteristic to fractal structure, boundaries emerge when some of the details are disregarded. Bybee (2002) discusses a number of sound changes that, although phonetically motivated, do not affect all possible lexical units simultaneously, but show lexical diffusion while in progress. In this process the same change can be seen repeating itself on various levels of abstraction (single items, smaller or larger subclasses) if looked at on different time scales. Something similar can be seen in the process of grammaticalisation where the meaning of the item goes through

repeated metaphoric extensions to new environments (Hopper & Traugott 2003). All these examples show how larger structures — be it spatial, structural or temporal — consist of similar structures manifested on subsequently smaller scales. Or vice versa, the most atomic patterns tend to evolve through cascading micro changes into even larger patterns that have the same general properties as the micro changes.

This does not mean that there is a teleology or destiny that the first micro change in the cascade will eventually lead to a macro change. It may remain only a temporary fluctuation, affecting only a subgroup of speakers, or a minor change giving rise to a very local variant. It is assumed here that the alteration of language is full of such small changes that temporarily affect a small subpopulation of the speakers and later fade away because of some other forces. The fluctuating nature of American English rhoticity summarized in Salmons & Purnell (2010) illustrates this. Extensive research on *r*-ful and *r*-less pronunciation in American English gives evidence of a large temporal oscillation in preference of one or the other variant through the geographic and social space, and through time. Furthermore, the variants have different social connotations and different dynamics in different subcommunities of speakers, so that the changes in the preferences of one variant over the other are neither simultaneous nor unidirectional.

If language change has such a fractal structure, the study of micro changes becomes directly relevant for understanding language change in general. However, the study of micro changes is methodologically demanding: firstly, on the macro level it is the stage of actuation of change (Weinreich, Labov & Herzog 1968), and at this stage the frequency of the innovating forms is very low. This means that the object of study is random fluctuations of usage rather than rule-governed linguistic behavior (Ehala 1996). Secondly, at the initiation stage, we do not know whether a particular micro change will lead to a cascade, resulting in a new dominant pattern. For this reason, it is legitimate to ask whether the detailed study of usage fluctuations in a small subsection of the speech community can have any relevance for the study of language change in general.

Still, if language change is a cumulative cascade of changes, each miniature step forward is a fluctuation that contributes to the overall macro phenomenon. understanding the mechanism of micro changes helps to put together the patchwork that explains the macro change. In this perspective, the micro level study of the diffusion of impositional deviations in a narrow subpopulation of users can have implications for the understanding of language change in general.

3.   Design of the study

3.1   Language contact situation in Estonia

The language contact setting in Estonia provides a rich environment for studying contact-induced variation and change. There are two major speech communities in Estonia: Estonians (69%) and Russian-speakers (30%). The linguistic environment varies considerably by region: northeastern towns in Estonia are predominantly Russian-speaking (70–95%), the capital Tallinn and its surrounding area are balanced (nearly 50% Russian-speakers), other major urban centres are predominantly Estonian (10–30% Russian speakers), and rural areas and small towns are practically Estonian monolingual (less than 10% Russian speakers).

There is no doubt that impositional innovations in Estonian produced by Russian-speakers are heard by native Estonians. In particular, the case marking of the Estonian direct object has been shown to pose a considerable problem for L2 learners, so that object-marking errors are very common in Estonian L2 usage (Pool 2006, 2007, Torn 2003). Even though there are signs of occasional accommodation of native Estonians to the Estonian spoken by Russians in inter-ethnic communication (Ehala & Üprus 2008), the possible diffusion of the impositional innovations on Estonian L1 usage has not been studied before.

3.2   The case-marking system of the object in Estonian

The morphological marking of Estonian object-NPs is complex. The Estonian direct object can be in the partitive, genitive or nominative case, with partitive perceived as prototypical for the object. The morphological manifestation of these three cases is variable, depending on declension class: for about 60% of the lemmas, partitive is distinguished by a case ending (*-t* or *-d*), while nominative and genitive are distinguished by stem change or they are indistinguishable; for the rest of the declension classes, the cases are differentiated by stem alteration only, and there are minor classes where these three cases can not be distinguished at all (Ehala 2009). Examples of these possibilities are presented in Table 1:

Table 1. Morphological manifestation of object cases

Nominative	Genitive	Partitive	Meaning
kaas	*kaane*	*kaan-t*	"lid"
oluline	*olulise*	*olulis-t*	"important"
tasku	*tasku*	*tasku-t*	"pocket"
jalg	*jala*	*jalga*	"foot"
isa	*isa*	*isa*	"father"

The choice of a particular object case is conditioned by semantic and grammatical factors. On semantic grounds, two object types are distinguished: partial and total objects. Partial objects are in the partitive case and express the imperfective aspect (1) and/or a quantitatively indefinite object (2); negative sentences permit only the partial object (3):

(1) *Mees lammutas   auto-t.*
    man demolished car-PARTITIVE'
    "The man was demolishing a car."

(2) *Tüdruk sõi pitsa-t   ja tänas   pärast   viisakalt.*
    girl   ate pizza-PARTITIVE and thanked afterwards politely
    "The girl ate some pizza and said thank you politely afterwards."

(3) *Poiss ei   leidnud oma saabas-t.*
    boy   not found   his boot-PARTITIVE
    "The boy did not find his boot."

The total object is predominantly in genitive and expresses the perfective aspect (4) or a quantitatively bound object (5):

(4) *Mees lammutas   auto   ära.*
    man demolished car+GENITIVE away
    "The man demolished the car."

(5) *Tüdruk sõi pitsa   ära ja tänas   viisakalt.*
    girl   ate pizza+GENITIVE away and thanked politely
    "The girl ate the pizza and thanked politely afterwards."

The total object is in nominative if the verb is in the impersonal voice (6), in the imperative mood (7), or in the infinitive (8).

(6) *Saabas   lei-ti   voodi alt.*
    boot+NOMINATIVE find-IMPERSONAL bed   under
    "The boot was found under the bed."

(7) *Otsi saabas   üles!*
    find boot+NOMINATIVE up
    "Find the boot!"

(8) *Mei-l   on kavatsus lõpeta-da   leping*
    we-ADESSIVE is intention end-INFINITIVE contract+NOMINATIVE
    "We have the intention of ending the contract."

The object case rules are summarized in Table 2, showing that the partitive is the most prototypical case for the Estonian direct object: it occurs in all negative

Table 2. Case marking rules for the Estonian direct object

	Finite verb, personal voice and affirmative	Infinitive, impersonal voice or imperative mood	Negation
Imperfect aspect or quantitatively unbound object	Partitive	Partitive	Partitive
Perfect aspect or quantitatively bound object	Genitive	Nominative	

sentences and all sentences where a partial object is needed to express the imperfect aspect or unbound object. Genitive is next most common, as it is the default case for expressing the perfect aspect or a quantitatively bound object. Nominative has the narrowest distribution as an object case, occurring only in sentences which do not have grammatical subjects.

3.3 The design of the data elicitation tasks

While object marking errors are quite common in Estonian L2 usage, their frequency in the spontaneous oral and written usage of Estonian L1 is not of a magnitude that has caused the general public to recognize variation. Thus, we have either a very early stage of a change or just random fluctuations that may have little or no effect on the overall system in long term. The low frequency of the phenomenon makes it hard to collect a sample for statistical analysis. Therefore, it was decided to elicit them by two specially designed linguistic tasks: a written production task and a grammaticality judgment task.

The production task consisted of a coherent text where the subjects needed to fill in the blanks left for the objects so that the sentence (and the whole text) seemed natural. The text was specially designed so that all object positions required a morphological form of the same word, *leping* "contract", in 16 different grammatical constructions. This word belongs to the declension class where partitive has the ending *-t* and nominative and genitive are distinguished by stem alternation.

The grammaticality judgment task required the subjects to rank context-free sentences for their acceptability on a four-point Likert scale which had the following scale points: 'completely natural', 'rather natural', 'rather unnatural', and 'completely unnatural'. The sentences were constructed so that some of them followed the pattern of object case assignment in standard Estonian, and some deviated from it. The grammaticality judgment task consisted of 88 sentences, of which 52 focused on the object forms and the rest were fillers.

In order to link language usage to the user's language contact profile, the questionnaire consisted of 11 items self-reporting the respondents' linguistic

background, intensity of language contact, the language choice in interethnic encounters, and items for such socio-demographic details as gender, age and area of residency.

3.4 Sampling

The goal of the study was to obtain an overview of object case marking variation in different linguistic environments, characterized by differing intensity of language contact. These criteria were best met by the secondary school student population, who spend a considerable amount of their day at school, where the language-contact setting can easily be specified. As using Likert scales requires conscious judgment and concentration, the oldest group (16–18 years old) were chosen as subjects. Students fulfilled the tasks during their school activities, but the results of the tasks were not used to assess their performance, as was explicitly stated prior to the performance. Teachers were asked 3 months beforehand not to teach related material prior to the tests.

The size of the obtained sample was 669 students, of whom 41% were male and 59% were female, 70% were 17–18 years old, 20% 16 years old and the rest mainly a year younger. 72% of respondents lived in cities, 18% in towns and 10% in rural areas. 578 respondents (86%) were native Estonians, and 91 (14%) were nonnative, overwhelmingly Russian speakers. As only schools with Estonian as the language of instruction were included in the sample, the percentage of the non-Estonian population in the sample was smaller than in the respective areas as a whole, although the relative distribution corresponded to the areal pattern. No generalizations can be made from the results of the study to Estonian as a whole, but the goal was to study the diffusion process of contact induced innovations. Whether it will become complete in Estonian depends on a large number of factors and, therefore, the possibility of its occurrence cannot be determined. Yet, it provides useful information on the process of how contact-induced innovations spread. Following the assumptions in §1, the results may be relevant for the theory of language change, even if this particular fluctuation never gains enough momentum to develop into a macro level language change.

4. Results

4.1 Variation in Estonian object marking

A detailed account of the results of the study by individual items is presented in Ehala (2009), and therefore only a summary of findings is repeated here:

1. When the partitive case was expected, both the L1 and L2 groups occasionally produced and also accepted the nominative case, but only the L2 group also produced and accepted some genitive forms.
2. In nominative contexts, both groups produced and accepted some partitive forms; however, genitive forms were used and accepted in this context only by the L2 group.
3. In genitive contexts, both groups accepted some partitive and nominative forms, but the partitive was clearly the more common deviation.
4. The same variation patterns occurred both in the production task and in the grammaticality judgment task, although the variability in the grammaticality judgment task was considerably larger, i.e. the deviant forms were judged as acceptable at a much higher rate, while similar forms were produced.
5. The non-native respondents had a considerably higher rate of variability than the native respondents. The items in which the non-native respondents reported less than 70% of standard forms also showed increased variation in native speaker responses; the items where non-natives had higher than a 70% correctness rate showed almost no variation in native speaker responses.

Thus, there was some leakage of all object cases to contexts where they were not expected. Therefore, one could argue that there are three potential diachronic trends in the Estonian object case marking system, manifested in the current variation: the over-generalization of the partitive (PartTrend), the over-generalization of the nominative (NomTrend) and the over-generalization of the genitive (GenTrend).

Our goal is to analyze the dynamics of this variation by finding possible correlations to the intensity of personal contact with Russian speakers, knowledge of Russian, and other social factors that may reveal the patterns of diffusion of these innovative forms. In order to carry out statistical analysis, summary indexes for each trend were calculated and their validity assessed.

4.2 Assessing the validity of the Trends

To test whether the variation pattern found in the usage of Estonian object-marking forms in fact represents three competing underlying trends, the Cronbach (1971) method was used. This statistical procedure calculates inter-item correlations among variables that are supposed to manifest a trend, in order to see whether there is a pattern in responses to the items and whether this pattern is stable for all respondents.

For example, in the grammatical judgment task, there were 12 sentences in which the partitive was used instead of the correct genitive (eight sentences) or nominative (four sentences). Five of these 12 sentences are presented in Table 3

for illustrative purposes. The sentences were accepted as natural by different numbers of respondents (in Table 3, the percentages of 'completely natural' and 'rather natural' responses are totaled as the acceptance level). In order to assess whether the deviation pattern in all 12 sentences was a manifestation of a single underlying trend (PartTrend), the strength of their correlations was assessed using the Cronbach method, with strength expressed by Cronbach alpha, which can have values up to 1.0. Generally, one can conclude that all the items in the set express the same phenomenon if the Cronbach alpha is larger than 0.7.

Table 3. Acceptance rates for overuse of the partitive in different test sentences.

Sentence	Acceptance level (%)
Liitlasväed on valmis lõpetama sõjategevust. "The allies are ready to stop the military activity."	80
Politseid kutsuti õnnetuskohale. "The police were called to the scene of the accident."	38
On tarvis seda autot maha müüa. "One has to sell this car."	24
Sellele küsimusele leiame lahendust. "We'll find a solution to this problem."	17
Ma pean saama seda töökohta. "I need to get this job."	6

The Cronbach alpha for the 12-item set for partitive overuse was 0.78, indicating that the response pattern in these sentences indeed manifested a single underlying phenomenon — PartTrend.

GenTrend occurred in six sentences, where the genitive was used either in the partitive contexts (three sentences) or nominative contexts (three sentences). The Cronbach alpha was also high (0.81). NomTrend occurred in the genitive and partitive contexts (nine sentences), but the internal consistency of this scale was somewhat lower ($\alpha = 0.62$), indicating that the trend of nominative spread to other contexts was weaker than in the case of the partitive and genitive, but still present. As the alpha values were satisfactory or better, the validity of PartTrend, GenTrend and NomTrend was confirmed.

To test whether the grammaticality judgment test and the production test measured the same phenomenon, the correlations between the trends and the results of the production test were analyzed. For this, the summary indexes of PartTrend, GenTrend and NomTrend were calculated as the mean scores for grammaticality judgments for the sentences belonging to each trend. The results of the production test were summarized as an index of the deviation rate in object case production in general (ProductionDev). For this, each deviation from the standard object case

was assigned the value of 1, while correct forms were assigned 0. By summarizing the scores for all 16 test items, each respondent was assigned a production variation score that could vary from 0 (no deviations) to 16 (no standard forms). The correlations between the trends and ProductionDev were strong (see Table 4), suggesting that both the grammaticality judgment test and production test indeed measured the same phenomenon.

Table 4. Correlations between summary scales

	ProductionDev
PartTrend	.503
GenTrend	.577
NomTrend	.332

All correlations significant at the .001 level.

To conclude, the high alphas and strong correlations indicates that PartTrend, GenTrend and ProductionDev were valid and reliable indices of deviations in the object case marking in this sample and can be used to inquire into the mechanism of the possible spread of impositional innovations from the variety of Estonian spoken by Russian speakers to the native variety of Estonian.

4.3 The diffusion pattern of PartTrend

While it is well known that the overuse of the partitive is larger among non-native speakers of Estonian and, therefore, that variation as a whole is contact-related, the analyses do not shed light on whether and how the deviations spread. For this, the Estonian L1 speakers were separated from the sample and analyzed for a possible link between PartTrend and the variables indicating the strength of language contact for each respondent.

As the questionnaire included items where respondents rated the intensity of their contacts with Russian speakers, their knowledge of Russian and their frequency of usage of Russian, the summary variable RussContact was calculated. The internal consistency of this scale was acceptable (alpha was .722).

Surprisingly, the correlation of RussContact with PartTrend was very low and insignificant. The correlations of PartTrend to all of the component items of Russ-Contact were also low and insignificant, as were correlations to other factors connected to language contact, such as the choice of language in inter-ethnic encounters, the percentage of Russian speakers in the area of the school of the respondent, and the percentage of Russian speakers in a particular school.

There were only two factors that had low but significant correlations with PartTrend: the school rating (indicated by the mean result of all state examinations

taken in this school), and gender. The correlation of PartTrend with the school rating was −0.148 at the .001 significance level, indicating that the higher the performance of the graduates of this particular school on the state examinations, the lower the rate of acceptance of the sentences with deviant object forms by the native Estonian respondents in this school. The correlation between PartTrend and gender indicated that males are likely to use more deviant forms than females. The correlation was significant, but weak (0.130 $p < .01$), explaining a mere 1.7% of the variation.

Thus, the analyses above do not indicate a link between language contact and overuse of the partitive in the object context among native Estonian students. Instead, if anything, males may be leading at this early stage. This hypothesis is given some support by the fact that the school rating is only correlated to the girls' usage ($r = −0.210$, $p < .001$), while the boys' variation is not affected by this factor.

The pattern becomes clearer when one looks at the variation among those who are from Estonian-Russian bilingual homes (see Table 5).

Table 5. The effect of home language and gender on variation in PartTrend

| | PartTrend | | | |
| | male | | Female | |
Home language	N	mean	N	Mean
Est	225	2.83	323	2.94
Est & Russ	24	2.51	30	2.74
Russ	20	1.98	34	2.03

Table 5 reveals that PartTrend is led by Russian respondents, but this group shows no gender differentiation here. Therefore, it could be assumed that for this group the variation is directly connected to language learning, a condition that affects both genders equally. As L2 speakers they are not even aware that the overuse of the partitive might be connected to gender in native speech, i.e. they are not aware of the possible social connotations of this feature.

The gender differences in PartTrend are the largest in the group of Estonian-Russian bilingual respondents: for boys, the PartTrend index is considerably lower, indicating a higher level of acceptance of deviant object forms with the partitive. Bilingual girls approximate the standard more closely. Due to the small size of the group, the difference is not statistically significant at the acceptable level ($p = .170$), although its effect is larger (eta squared $= .037$) than among native speakers.

The interaction of home language and gender in the variational pattern of partitive overuse can illuminate the mechanism of innovation diffusion over the ethnic border in the case of impositional changes. The data above seem to suggest

that fluent bilinguals who are able to claim membership in both groups can act as a bridge between the two communities. As the balanced bilingual males could be accepted as ingroup members by the native speakers of Estonian, their elevated level of partitive usage could be spreading to the native male usage as the data indicate.

4.4 The diffusion pattern of GenTrend

As with PartTrend, the correlation between GenTrend scores and indexes for the intensity of language contact were calculated. The analysis showed that the over-use of genitive by Estonian L1 subjects is in a weak, but statistically significant ($p < 0.01$) positive correlation with the strength of the language contact network ($r = 0.144$), knowledge of Russian ($r = 0.139$) and frequency of Russian usage ($r = 0.186$). The correlation of GenTrend with choosing Russian in conversations with Russian speakers was slightly higher ($r = 0.215$). These results confirm that the grammaticality judgments of Estonian native speakers regarding sentences with deviant usage of genitive in the object position is related to the intensity of their contacts with Russians, their knowledge of Russian and its frequency of use.

In GenTrend there was another interesting feature — as in the case of Part-Trend, a small, but statistically significant difference between males and females was detected: native Estonian boys considered deviant sentences with the genitive more natural than did girls (eta squared 0.02). Similarly to PartTrend, Russian L1 speakers did not show statistically significant gender differentiation and their difference in acceptance rate from natives was of the same magnitude (see Table 6).

However, compared to PartTrend, the GenTrend pattern showed a couple of significant differences. First, deviant sentences with the genitive were considered much less natural than with the deviant partitive by all respondents, notwithstanding their native language or gender (the average rating over 3.5 shown by native speakers for genitive overuse is between 'rather unnatural' and 'completely un-natural'). And second, bilingual males aligned much closer to Russian L1 speakers in case of GenTrend than in the case of PartTrend.

These differences between the trends are theoretically interesting. Both follow the same general pattern, and they are parallel. Overuse of the partitive is wide-spread, while overuse of the genitive is marginal. In the case of partitive overuse, bilinguals are closer to Estonian speakers, in the case of genitive overuse, bilin-guals are closer to Russian speakers. Thus, the over-generalization of the genitive seems to be a ethnically marked feature, characterizing those who have Russian background or close connections with Russians; the patterns of overuse of Parti-tive does not have this ethnic divide.

Table 6. Overuse of the genitive and native language

		Gender			
		Male		Female	
		GenTrend		GenTrend	
		N	mean	N	Mean
Home language	Est	225	3.57**	323	3.69**
	Est and Rus	24	2.76	30	3.29**
	Rus	20	2.60	34	2.50**

** $p < 0.01$ between home languages

4.5 The diffusion pattern of NomTrend

The nominative was overused in both genitive and partitive contexts, but in genitive contexts the acceptance pattern did not conform to a single underlying trend. In partitive contexts, most of the cases were the negative forms of impersonal sentences, such as (13) in Table 7: *Arnold Rüütel ei valitud presidendiks* "Arnold Rüütel (NOMINATIVE) not elected (IMPERSONAL) for president (TRANSLATIVE)" instead of *Arnold Rüütlit ei valitud presidendiks* "Arnold Rüütel (PARTITIVE) not elected (IMPERSONAL) for president (TRANSLATIVE)" Four items ((9)–(12)) in the NomTrend are from the production task while (13) is from the grammaticality judgement task.

Comparing NomTrend with the parameters indicating the strength of language contact revealed a clear correlation. Table 7 presents the results of a t-test measuring the strength of the relationship between overuse of the nominative in four production test sentences and the intensity of language contact; and a correlation analysis of the same in one grammaticality judgment test sentence. The t-test shows whether the difference in the means of two groups is statistically significant. The data presented in Table 7 includes only native Estonian respondents.

The t-test compared two groups: those who formed sentences using the object in the nominative ('nom' lines in Table 7) and those who used the standard form, the partitive ('part' lines in the table). Cases of comparison were the mean values for continuous variables indicating the intensity of language contact. The continuous variables were the choice of Russian in conversations with Russian speakers ('Langchoice' in Table 7, scale from 1 to 8, the higher the value the more Russian was used); linguistic contact network ('Network', scale from 1 to 4, lower values indicate more contacts); frequency of the use of Russian ('Frequency', scale from 1 to 4, lower values indicate more frequent usage); and the knowledge of Russian ('Knowledge', scale from 1 to 4, lower values indicate better knowledge). The values in the table indicate the group mean for each particular variable in the case of

Table 7. The relationship between nominative overuse and language contact indicators

			Lang-choice	Network	Frequency	Knowledge
(9)	*et ...... ei oleks hiljem tarvis tühistada* "that the **contract** would not need to be nullified"	nom	2.94*	2.50*	3.01	2.76
		part	2.47*	2.64*	3.13	2.96
(10)	*et ...... ei sõlmita* "that the **contract** will not be ratified"	nom	3.01	2.34**	2.79*	2.54*
		part	2.50	2.64**	3.13*	2.96*
(11)	*kuigi ...... ei kavatsetud tühistada* "even if the **contract** was not intended to be nullified"	nom	4.03*	1.96**	2.30	2.00**
		part	2.50*	2.64**	3.12	2.95**
(12)	*et meil ei ole kavatsust ...... tühistada* "that we do not have an intention to nullify the **contract**"	nom	2.53	2.49	2.95	2.84
		part	2.53	2.63	3.12	2.94
(13)	*Arnold Rüütel ei valitud presidendiks.* "Arnold Rüütel was not elected president."	r	−0.132**	0.149**	0.153**	0.109**

* $p < 0.05$; ** $p < 0.01$

a particular sentence. The hypothesis was that overuse of the nominative in these sentences was related to intensity of language contact.

These results confirm this hypothesis at a high level of probability: in all cases, respondents overusing nominative also had higher levels of language contact than those who used standard forms; in half (8 out of 16) this difference was statistically significant at the 0.05 or 0.01 level. The same holds for the Pearson correlation test for the sentence (13): in all cases there was a weak, but statistically significant ($p < 0.01$) correlation between the acceptance of the nominative and the intensity of contact (r ranging between 0.11 and 0.15). Therefore, overuse of nominative is a trend that is directly affected by the intensity of language contact. The relationship is not very strong and differences not large between users, but they all point in the same direction and are in most cases statistically significant. Particularly relevant here is the fact that among native Estonian speakers overuse is affected both by the frequency of contacts with speakers of Estonian as L2 as well as the knowledge and usage of Russian.

5.   Discussion

The diffusion process of impositional innovations has been discussed in several works. For example, Thomason (2001) argues that if a shifting community is integrated into the dominant larger society so that the shifting community forms one speech community with the dominant language speakers, the linguistic result will be an amalgam of the two varieties of the target language, because dominant-language speakers will borrow only some of the features of the shifting group's variant. As an example, Thomason (2001) offers the case of a group of Hungarians shifting to a dialect of Serbo-Croatian. Serbo-Croatian has dynamic stress, whereas Hungarian stress is fixed on the first syllable. Shifting Hungarians were able to understand that the stress was not on the first syllable and, although they did not learn the real pattern, they fixed the stress on the penultimate syllable. When the communities became linguistically integrated, the whole dialect acquired the fixed penultimate stress.

Salmons & Purnell (2010) suggest that, in the first stage, impositional features are established as ethnolectal features; a generation or two later, they may lose their ethnic connotation and become regional features which, in the case of a possible koineization may become part of the emerging koine. Both scenarios involve a negotiation that may or may not lead to the acceptance of some impositional features on the dominant variety. The results of the current study can add precision to our understanding of this process.

The analysis shows that all three trends in object case marking are related to language contact, in that L2 users had a considerably higher level of acceptance and production of deviant forms in all three contexts. However, the diffusion patterns were different. First, for Estonian native speakers, the most advanced change (the overuse of partitive) did not correlate with the variables indicating Estonians' intensity of contacts with Russian-speakers nor with Estonians' knowledge and usage of Russian. The diffusion was a male lead phenomenon, in which bilingual males do the pulling. As fluent bilinguals can claim membership in both groups, they seem to act as a bridge for impositional innovations to enter the target language.

Secondly, in GenTrend and NomTrend, the acceptance and usage level of deviations was very low among native Estonian speakers, although the levels were nearly as high as in the case of PartTrend among Russian speakers. Unlike the case with PartTrend, the acceptance level for innovative forms by native speakers was related to the intensity of contact with Russian speakers, and also to native speakers' knowledge and usage frequency of Russian. The difference between the rate of the diffusion of PartTrend and the other two needs explanation.

The success of the diffusion of PartTrend, as compared to GenTrend and Nom-Trend, seems to be related to the fact that the partitive is the prototypical and most frequent case for the Estonian object, and this may affect both native and nonnative users in a similar fashion. Basically, the spread of the partitive is supported by an analogical extension which is not contact specific, but a cognitively universal tendency present in the usage of any language. Yet, it would be wrong to deny the role of contact here. Certainly, non-native speakers of Estonian contribute a large proportion of these deviations, which perhaps would not have emerged without the contact. In this sense, PartTrend is a contact-induced change, in a strict sense an imposition by nonnative users of Estonian. But since the overuse of partitive appears natural for native speakers, by analogy, the feature has not acquired an ethnic connotation and can be accepted more easily. This is why PartTrend is more contagious than the others.

The diffusion of PartTrend suggests that fairly limited contact may suffice for impositional features to cross the ethnic boundary if they are supported by some other causal force, such as analogy. This scenario shows also some resemblance to Heine & Kuteva's (2005, 2008) concept of contact-induced grammaticalisation: it is possible that contact plays a significant role at the initiation of change, which later proceeds by its own means. This possibility definitely blurs the distinction between contact-induced and internally caused changes.

The conditions for genitive spread are quite different. Here, we see moderate acceptance levels only among fluent bilinguals, and others whose contacts with Russian and knowledge of Russian are extensive. Among native Estonian subjects with little contact with Russian-speakers, acceptance of this type of deviant sentences was very low. The relatively low contagiousness of deviations with genitive can be explained by two factors: firstly, diffusion is not supported by analogy, as the prototypical function of the genitive in Estonian is not associated with the direct object. Secondly, since GenTrend has no universal or language internal support for native Estonians, but among native Russian-speakers it is relatively common, the occurrence of deviations shows a clear ethnic divide, which in turn inhibits its further spread among native Estonian speakers. Yet, the fact that those subjects with high contact with Russian and Russians showed higher acceptance levels indicates that the intensity of contact may overrule structural constraints.

The fact that GenTrend and NomTrend had higher acceptance levels among those native speakers who had both intense contact with non-native speakers and extensive usage of Russian further suggests that the division between impositional and adaptational changes may not always be that straightforward. Extensive usage may indicate the role of borrowing in the diffusion process. The separation of imposition and adaptation is even harder in the case of fluent bilinguals who seem to be the leading group in the spread of these innovations. Winford (2005)

has proposed that imposition diffuses in subtle ways: there are speakers who are already dominant in the target language, but still use their heritage language, and can borrow from this language; there may be native speakers whose knowledge of the source language is substantial enough for them to borrow these same features, etc. The results of this study provide direct support for this scenario, to the extent that in some cases it becomes difficult to say whether a feature is spreading due to imposition or adaptation.

The most far-reaching implication of this study of micro change is that the actual outcome of any fluctuations that may arise in a language contact setting is conditioned by a combination of a number of different causal factors, some of which are structural, some sociolinguistic, and some cognitive, demographic or economic. In the case of Estonian object marking, the joint effect of imposition and analogy boosts PartTrend, but other two trends are not very contagious. Still, the results indicate that GenTrend may have a potential to be established as an ethnolectal feature, as it is fairly frequent amongst Russian L1 speakers. Given the large share of Russian speakers in Estonia (about 30%), this leaves the door open for further spread in the future, but there is no way to predict such development now because of the fractal nature of macro change.

The fractal nature means that a macro change can be considered a change only post hoc, when the full cascade of component micro changes is completed. Yet none of these micro changes are complete until the cascade of their constituent changes is complete. Each of these micro changes is brought about by a particular combination of causal factors and if these conditions change, the cascade may stop or be overridden by another cascade. However, the fractal nature does not mean that the macro changes cannot have causes. Specifying the causes for a historical macro change would just presuppose that these causal forces must have been stable for the whole period of the change, and therefore these forces also served as the causes for the changes in the cascade. This would mean that it would still be possible to predict the macro outcomes of micro changes — provided that the combination of causal forces remains stable (which, of course cannot be granted).

6. Conclusion

The findings of the current study suggest that there are multiple causal forces at play influencing the diffusion of innovations. While any single factor may cause changes if it is strong enough, diffusion is greatly facilitated where different causal factors contribute to the same direction. In such cases, the actual language contact need not be extensive to induce a change, but its causal force can not be denied.

The study also shows that it may be impossible to decide whether a particular feature is brought into a language by imposition or adaptation, as both processes are available and both can be active in the diffusion of the same innovations. In particular, the number of fluent bilinguals among speech communities may be the crucial contributing factor for contact innovations to enter and to be accepted by native speakers.

Methodologically, this study shows how reliable data on changes in progress (or even potential changes in progress) can be collected at a very early stage when naturally occurring innovations are of such a low frequency that they cannot be collected for quantitative analysis. By combining this linguistic data with rich background information, it is possible to study the subtle causal forces that are in play in shaping a variational pattern in language contact situations.

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Zusammenfassung

Das Ziel dieser Studie ist es zu spezifizieren in welchem Ausmaß die Variation, die von russisch-dominanten L2-Sprechern des Estnischen in das System der Objektmarkierung des Estnischen eingeführt wurden, sich im Gebrauch des Estnischen als Solches verbreitet. Die Teilnehmer der Studie waren 669 Schüler in Sekundärschulen, die gebeten wurden, eine schriftliche Kreativaufgabe sowie eine Aufgabe zur Beurteilung von Grammatikalität von Objektmarkierung durchzuführen. Die Ergebnisse deuten darauf hin, dass die Variation in der Objektmarkierung ein Resultat des Sprachkontaktes ist und dass die Gruppe von fließend bilingualen Sprechern dabei als Brücke dafür wirkt, Neuerungen in das Estnische einzuführen, die dann von den Muttersprachlern akzeptiert werden. Die Resultate lassen auch vermuten, dass unterschiedliche Kausalfaktoren bei der Diffusion von Neuerungen zusammenwirken. Während jeder einzelne Faktor, wenn er stark genug ist, zur Diffusion führen kann, wird dieser Diffusionsprozess maßgeblich beschleunigt, wenn mehrere Kausalfaktoren gemeinsam in die gleiche Richtung hin wirken. In einem solchen Fall reicht ein relativ schwaches Maß an Sprachkontakt aus, um die Diffusion zu ermöglichen.

Résumé

Le but de cette étude est de préciser dans quelle mesure la variation introduite dans le système estonien de marquage de l'objet chez des locuteurs estoniens de langue maternelle russe s'étend dans l'estonien parlé par l'ensemble de la population. 669 élèves du secondaire ont été interrogés et ont répondu à un sondage portant sur la grammaire utilisée pour le marquage de l'objet. Les résultats montrent que la variation du marquage de l'objet s'explique par le contact langagier, et que c'est du groupe de locuteurs bilingues que commencent les innovations qu'acceptent par la suite les locuteurs natifs. Les résultats indiquent également que de multiples causes influencent la diffusion des innovations. Bien que tout facteur de causalité unique, s'il est assez fort, puisse à lui seul provoquer la diffusion d'une innovation, le processus se voit grandement facilité par la diversité des causes agissant dans le même sens. Lorsque c'est le cas, un contact assez faible est suffisant pour favoriser la diffusion.

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