Linguistic Innovation from Defunct Morphology:

Old Dual Endings in Polish and Russian

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This paper has two goals. One is to present a concrete discussion of the role of the dual in facilitating genitive-accusative case usage in the plural. The other is to, on the basis of this case study, make some suggestions about the mechanisms of language change.

Whereas the genitive-accusative singular (hereafter, GAsg) is pan-Slavic, the genitive-accusative plural (hereafter, GApl—other case-number combinations will be similarly abbreviated) developed not only much later but under a decidedly different set of circumstances. Several factors must be taken into account in considering the innovation of the GApl in Slavic: (a) it is dialectically restricted; (b) it is implemented to mark animacy in some languages, but virility in others; and (c) at the time of the innovation there was no nominative-accusative syncretism. Furthermore, there is evidence that the dissolution of the dual catalyzed the development of the GApl. Grappin (1950:94–101, 1956:106–15) presents a persuasive argument for this crucial role of the dual in the history of Polish. A similar sequence of events can be found in the history of Russian, but scholars of East Slavic (cf. histories of Russian by Sobolevskij 1907, Šaxmatov 1957, Borkovskij and Kuznecov 1963, Gorškova and Xaburgaev 1981, Issatschenko 1983; and similarly histories of Ukrainian by Kernyc'kyj 1967, Žovtobrjux et al. 1980, and of Belarusian by Jankoŭski 1989) never state that these events are causally related. Šaxmatov (1957:51) does say that we see a replacement of the Adu with the Gdu for viriles in Old Russian at a time when there is no evidence of a replacement of Apl by Gpl, and also states that in Old Russian the Npl and Apl remained distinct for viriles, but such statements are made separately and never drawn together to argue that these phenomena contributed to the development of a GApl. Krys'ko (1994:97–99, 103) likewise presents attestations of a GAdu, but claims that the GApl developed independently of the GAdu. However, the chronology of events as presented by most scholars supports the hypothesis presented here that Grappin's argument for the history of Polish is entirely applicable to the history of East Slavic.

The common assumption for Russian is that the genitive-accusative already present in the singular simply spilled over into the plural. Klenin (1983:89) summarizes her discussion of the plural by stating that "the extension of the genitive-accusative from the singular to the plural of masculine human-referential nouns would obviously have been particularly easy, and would have been in effect a stabilizing innovation." If Russian were our only Slavic language, we would have no reason to question this assumption. However, the dialectal

distribution of this innovation raises several questions. A singular genitive-accusative (originally marking viriles, later extended to all animates) is part of the common legacy of Slavic, continued to this day in all languages that retain case. Why then is the development of a plural genitive-accusative limited to Polish, Slovak, Sorbian, and East Slavic? And why does it mark virility in some languages, but animacy in others?

Krys'ko (1994) charts a history of animacy in the plural that departs significantly from the traditional timetable of events cited by his predecessors. According to him, all the relevant innovations took place in the Old Russian period (by the fourteenth century), rather than proceding in a gradual, step-wise fashion stretching from the fourteenth to the eighteenth centuries. The paucity of early examples of the GApl is explained by stating that it was a feature of everyday speech ("живая речь") that was suppressed by the literary tradition. Despite the intriguing examples he presents, there are issues that remain controversial in Krys'ko's account: (a) he identifies the syncretism of the Npl and Apl as the single most important factor in the development of the GApl, stating that this syncretism was already complete in the eleventh–twelfth centuries, in defiance of the traditionally recognized date (fourteenth century), and does not present examples to buttress this argument (Krys'ko 1994:104); and (b) his earliest example of a GApl (the only one from the twelfth century) involves the interpolation of a "missing" letter in the overturning of Zaliznjak's interpretation of a birchbark passage (Krys'ko 1994:104–6). Most of his thirteenth century attestations (Krys'ko 1994:106–8) are less problematic, which might induce us to push back the traditional date by one century, but such a shift does not substantially threaten the argument made below.

The only pan-Slavic hint of a GApl is the replacement of the original accusative first and second person pronoun forms *ny, vy* with the genitive forms *nasъ, vasъ*, a process already underway in Old Church Slavonic. Although this replacement certainly would be compatible with and support the later development of a GApl elsewhere in the morphology, in and of itself it is a dead end. It did not lead to a GApl in South Slavic or in Czech, and could not account for dialectal differentiation.

Nominative-accusative syncretism in the singular was a crucial (though not the only) motivation for the development of a singular genitive-accusative, however the historical record shows no correlation between instances of NApl syncretism and the development of a GApl. In South Slavic there is no NApl syncretism and no innovation of a GApl; this is not problematic. But in all of North Slavic except Czech, a GApl does develop and it develops precisely where there is also no NApl syncretism: among virile nouns. As we know, the Npl and Apl of *o*-stem masculine nouns were distinct in Common Slavic. The Npl ending was -*i*, which occasioned the second regressive velar palatalization as well as distinctive sharping in North Slavic (subject to later hardening in some languages). The Apl ending -*y* did not produce morphological alternations, and even after the merger of **y* and **i*, the Npl and Apl endings remained distinct due to the morphological alternations that were associated only with the Npl.[1] The Apl -*y* gradually

replaced the Npl -*i,* beginning with inanimate nouns and working its way up the animacy hierarchy. In Czech, which never developed the GApl, the Apl -*y* replaced the Npl -*i* only for inanimate nouns. In Polish and Slovak, the Apl -*y* was spread to inanimates and animal names; there the GApl develops precisely for those nouns that never adopted a syncretic NApl — the viriles — for which the Npl is -*i* (or bears the alternative virile ending of -*owie* in Polish, -*ovia* in Slovak) and the Apl is -*y.*[2] Although subsequent developments have spread both the NApl -*y* and the GApl considerably farther in East Slavic, at the time of the innovation of the GApl the situation in East Slavic was comparable to that in modern Polish and Slovak: the GApl developed to mark virile nouns (initially there was a period of variation, but viriles were clearly favored to the eventual exclusion of others), precisely the same set of nouns which at the time had the distinct endings Npl -*i* as opposed to Apl -*y.*

Thus, prior to the development of the plural genitive-accusative there was no nominative-accusative syncretism in the plural; the syncretic NApl appears later and/or is limited to inanimates. We must therefore look elsewhere for a motive for adopting a GApl. Whereas the nominative and accusative were distinct in the plural, there was a non-singular environment that displayed nominative-accusative syncretism: the dual. In most of North Slavic the Adu -*a* (syncretic with the Ndu) for masculine *o*-stems was replaced by the Gdu -*u* for viriles in direct object position. Although this innovation was not implemented at the same time throughout the territory, the virile GAdu consistently predates (or, if we accept Krys'ko's chronology, overlaps with the innovation of) the GApl. Despite the fact that the data for the GAdu are not robust, they are significant, since the loss of the dual and the acquisition of the GApl neatly coincided. As the dual was lost, its morphology was supplanted by the plural and thus the virile GAdu was morphologically transformed into a GApl.

Old East Slavic developed its GApl under conditions virtually identical to those found in Old Polish, where Grappin argues that the dual played an essential role. For many reasons, the history of the GApl in North Slavic becomes de facto a comparison of Polish and Russian. Czech never developed a GApl. Slovak did, but because Czech long served as the literary language of Slovakia, we have so little in the way of reliable attestations of Slovak prior to the seventeenth century that it is impossible to recover much of the morphological history of that language. Polish is then the only major West Slavic language with an intact and relevant written record. In East Slavic the initial innovation of the GApl occurred earlier and is shared by all three East Slavic languages, although it later spread farther in Russian and Belarusian (where it marks all animates) than in Ukrainian (where GApl is optional for animal names and obligatory for viriles). Although the earliest attestations of a GApl belong to a period just after the shared Old Russian/Old East Slavic period, this event and the events leading up to it are the same for all East Slavic languages, so differentiating among pre-Belarusian, pre-Ukrainian and pre-Russian would not enrich our discussion. For simplicity's sake we will call it Old Russian since most handbooks of Old East Slavic are written from the perspective of Russian, but we will understand that Old Russian here includes the precursors of Belarusian and Ukrainian.

The main difference between the development of the GApl in Polish and in Russian is temporal: it took place in the sixteenth century in Polish, but we have to go back to the fourteenth century to look for it in Russian. Since the record of attestations for both languages is much richer in the sixteenth century than in the fourteenth, if conditions are indeed similar, we stand to learn more about the process from Polish than from Russian.

We will follow the development of a hypothetical phrase 'he had (two) (young) sons,' where the overt expression of the numeral is optional to the construction, as is the use of an adjective (the use of the noun *syn* 'son' is a trifle problematic since it is an old *u*-stem and quite irregular in modern Russian, but this is one of Grappin's examples, and perhaps semantically one of the most likely viriles to appear in the Adu). In examining the scenarios outlined below, the reader should try to imagine him/herself in the role of a language learner in the century when the GApl first appeared. Consider the patterns of nominative, accusative, and genitive case marking for various sets of nouns available at the time and how the construction in question related to those patterns.

The chronology for Polish is adapted from Grappin (1950, 1956). As stated above, there was no nominative-accusative syncretism in the plural, but there was nominative-accusative syncretism in the dual, and early attestations of Old Polish show the replacement of the Adu with the Gdu, primarily for virile nouns. As the dual was lost, however, its endings were gradually replaced by corresponding plural endings and the construction was spread to other numerals; thus the virile GAdu was transformed into a GApl. Grappin argues that thanks to its original nominative-accusative syncretism and later replacement by the plural, the dual mediated the innovation of the GApl. The following table gives the chronology of events.

14th century	*miał (dwu) (młodu) synu*	Adu replaced by Gdu for viriles and some animates
15th century	*miał (dwu) (młodych) synu*	Gdu replaced by Gpl for adjective
16th century	*miał (dwu/dwóch/trzech/czterech/* higher indefinite numerals in *-u) (młodych) synów*	spread to other numerals; Gdu replaced by Gpl for noun
Also 16th century	(a) Npl *-i* (with II velar palatalization + sharping) for viriles is opposed to Apl *-y;* (b) GAsg is restricted to viriles (until 17th century); (c) the dual is eliminated	
Later	The numeral construction *dwu/dwóch/trzech/czterech/* higher & indefinite numerals in *-u (młodych) synów* spreads to subject position, replacing nominative	

Table 1: GAdu in Polish: **miał (dwa) (młoda) syny/a*

Grappin (1950:94–101, 1956:106–15) adduces that the declining dual indeed served as the midwife of the modern GApl in Polish. The first evidence is of the replacement of the Adu with the Gdu in the fourteenth century, creating the earliest attestations of a GAdu. The GAdu first appeared in legal prose, where it became standard by the fifteenth century: *we dwu kmieciu* '(in) two peasants' (Zapiski sądowe b, 1398); *posłała ... dwu panicu* '(she) sent ... two young men' (Zapiski sądowe k, 1403); *dwu starszu ... a drugu dwu ... a trzeciu dwu ... ma wieść* 'he is to lead two elders, and another two and a third two' (Kodeks Suleda, mid-fifteenth century); *posłał dwu zwoleniku* '(he) sent two followers' (Rozmyślanie o żywocie Pana Jezusa, late fifteenth century); *miał dwu synu* 'he had two sons' (Kryński, Zabytki języka polskiego, 1529). Grappin cites over 40 attestations of the GAdu in fourteenth and fifteenth century Polish documents. Although the majority of attestations involve virile nouns, there are some animates: *wyrzezył kobyłę a dwu wołu* 'he replaced a mare and two oxen' (Zapiski sądowe k, 1403); *ma wziąć... dwu wieprzu* 'he is to take ... two pigs' (Kodeks Działyńskich, 1460); *kupiłbym ci dwu koniu* 'I would buy you two horses' (Fortunat, 1570). As these examples indicate, animates (all attestations are of common domesticated species) could use the GAdu through the sixteenth century, but this use occurred exclusively in the presence of the numeral *dwu* 'two'; it never spread beyond this context and subsequently disappeared.

Already in the fifteenth century, dual forms began to be replaced by the corresponding plural forms: *zabił twoich dwu bratu* 'he has killed your two brothers' (Rozmyślanie o żywocie Pana Jezusa, late fifteenth century); *potym wziął Filipa a dwu Zebedeow, Jana a Jakoba, brata jego, a też synow Alfeowych* 'then he took Philip and the two (sons of) Zebedee, John, and his brother James, and also the sons of Alfeus' (ibid.). In the sixteenth century the construction spreads to other numerals, and even to uses where no numeral is specified: *uźrzeli trzech człowiekow* 'they saw three men' (Historia Aleksandra, 1510); *miała trzech synów* 'she had three sons' (Historia o żywocie i znamienitych sprawach Aleksandra Wielkiego, 1550); *obrała była siedmi dyakonów* 'she had chosen seven deacons' (Rozmowy dworzanina z mnichem, 1553); *Cóż macie miedzy sobą tych łotrów łakomych?* 'Why do you have among you these greedy scoundrels?' (M. Rej, Zwierzyniec, 1562). Grappin presents over 60 such attestations from the sixteenth century.

The advent of the GAdu and its transformation into a GApl both predate the spread of the original Apl -*y* to the Npl, which began in the sixteenth century, included the animates in the seventeenth century, and continues to spread. In modern Polish NApl -*y* has been extended to some viriles, where it serves a deprecatory function (cf. nouns like *bękarty* 'bastards', *koniokrady* 'horse-thieves', *Murzyny* 'Negroes', *cygany* 'gypsies', *pedały* 'homosexuals [vulg.]'), but in the fourteenth century, the Npl and Apl of all animate nouns were still distinct.

If we turn now to Russian and look at what historical grammars tell us about the timing of parallel innovations, we find that fourteenth century Old Russian was in a situation similar to that of sixteenth century Polish. A GAdu was

already established, the Npl and Apl remained distinct for viriles, and the GAsg was in force for the same set of nouns. The Apl *-y* only began to spread in the thirteenth century and then mainly to inanimates; in the fourteenth and fifteenth centuries *-i* with its alternations was still the norm for thè Npl of viriles. According to Unbegaun (1935:154–59), Npl *-i* for viriles had lost productivity by the sixteenth century, at which time it was retained for about a dozen nouns, and this class of nouns was gradually curtailed through the rest of the history, leaving behind just *sosedi* 'neighbors' and *čerti* 'devils' in modern Russian. By the seventeenth century the GAsg had spread to all animates. The Gdu was replaced by the Gpl for adjectives prior to the total breakdown of the dual in the fourteenth century, just after the earliest attestations of the GApl. Given these strong parallels, it certainly seems plausible that the the dual played a supporting role in bringing about a GApl in East Slavic as well.

The table below outlines a development following that of Old Polish; *jers* are indicated only in the oldest version of the phrase since they were merely orthographic (did not indicate vowels) during much of this time period and their presence or absence is not relevant.

12th century	*iměl (dvu) (moloduju) synu*	Adu replaced by Gdu for viriles; pronouns earlier
13th–14th century	*iměl (dvu) (molodyx) synu*	Gdu replaced by Gpl for adj; earliest exx of GApl
14th–15th century	*iměl (dvux/trex/četyrex) (molodyx) synov (> synov'ej)*	spread to '3, 4'; Gdu replaced by Gpl for noun
Also in 14th century	(a) Npl *-i* (with II velar palatalization and sharping) for viriles is opposed to Apl *-y* (Apl *-y* replaces Npl *-i* for viriles in 15th–16th centuries) (b) GAsg is restricted to viriles (until mid 17th century) (c) the dual is eliminated	
Later	The GAsg spreads to all animates by 17th century and the GApl follows suit in the 17th–18th, spreading also to feminines as gender distinctions are reduced in the plural in East Slavic.	

Table 2: GAdu in Russian: **mělъ (dъva) (molodaja) synyla*

Sobolevskij (1907:199) notes that the replacement of the accusative forms by genitive forms for dual pronouns was well established for first and second person pronouns and common for others (e.g. *samъ* 'self' as well as the numeral *oba* 'both') in the earliest texts of Old Russian, citing examples such as, **vaju xvalimъ** 'we praise you (two)' from the Putjatina mineja in the eleventh century, *Gospodъ krъsti oboju* 'the Lord baptized both of them' from the Tolstovskij sbornik of

the thirteenth century, as well as numerous examples from other sources: *Ianъ posla naju k tobě* 'John sent the two of us to you', *kto vъprašaet vaju* 'who asks you two', *srjaščetъ vaju čelověkъ* 'a man will meet the two of you' (Prejaslavskoe evangelie, 1354); *vъzvysila estъ vaju ljuby* 'love has raised the two of you up', *prija eju v ljubovъ* 'received the two of them with love' (Laurentian chronicle, 1377); *niščъ i bogatъ strětostasja, oboju že Gospodъ stvori* 'the poor man and the rich man met, for the Lord created them both' (Grigorij Bogoslov, fourteenth century). Šaxmatov (1957:225–26) cites similar examples from the Hypatian chronicle: *seju snemъše* 'having taken these two down', *jejuže proklenše* 'having cursed the two of them'.

Šaxmatov (1957:51) cites as the earliest example of the replacement of genitive for accusative dual in a non-pronominal noun phrase the following excerpt from the Hypatian chronicle under the year 1071 (which probably dates from the thirteenth–fourteenth centuries): *sněde kudesniku* 'consumed (two) sorcerers'. Further attestations include *perenesoša bratьja vsja svjatoju mučeniku Borisa i Glěba* 'all the brethren carried over the holy martyrs Boris and Gleb' (this under the year 1115 in the Laurentian chronicle of 1377) and *viдě stojašča mučeniku Borisa i Glěba* 'he saw the martyrs Boris and Gleb standing' (under the year 1263 in the same source; Šaxmatov 1957:51, Sobolevskij 1907:204). On the basis of these and a few other attestations, Krys'ko (1994:98) postulates a GAdu originating in the twelfth century.

The next stage, namely the gradual replacement of dual morphology by plural morphology, is not well attested, at least not for the development of the GApl from the existing GAdu. Šaxmatov provides evidence from constructions other than the virile accusative to show that the morphology of dual noun phrases was replaced by corresponding plural inflection, beginning with the adjective in oblique cases; this process was well underway by the fourteenth–fifteenth centuries (1957:211). It can be assumed that the morphology of the GAdu underwent this transformation at the same time and in the same way as any other oblique dual. Sobolevskij (1907:206) gives a pertinent example that lends credence to this claim: *svjatyxъ mučeniku Borisu i Glěba* 'the holy martyrs Boris and Gleb' (with a Gpl ending on the adjective, but Gdu on the following noun; the -*u* ending on *Borisu* appears to be an error here, a contamination from the ending of the preceding word). It is unfortunate that this is a Gdu, not a GAdu, but it seems safe to assume that the GAdu would have behaved in the same fashion. This chain of developments provides a source for GApl morphology used with dual viriles that coincides with the innovation of the GApl for plural viriles and predates the syncretic NApl for viriles.

The numeral was always optional in such phrases, and in the fourteenth–fifteenth centuries, the GAdu spread to numerals 'three' and 'four', just as other dual morphology (most notably the NAdu endings -*a, -i* which now serve as paucal plurals in Russian) spread to these numerals. As time progressed, the GApl further spread to all numerals and all plurals, and also included all uses of the accusative (i.e. prepositional uses in addition to direct objects). The earliest uncontroversial evidence of a true GApl in Old Russian comes from the late

fourteenth–early fifteenth century: *sud(i)ti porubežnyx(ъ) ljud(ei) i tatei i rozboj-nikovъ* 'to judge the border people/the imprisoned and thieves and robbers' (Novgorodskie gramoty 1436–61). The perseverance to modern times of original Apl forms precisely for viriles after *v* 'into' in phrases indicating the joining of a group (cf. examples like *idti v gosti* 'go visiting', *proizvesti v polkovniki* 'promote to colonel', *igrat' v razbojniki* 'play robbers', *posvjatit' v monaxi* 'tonsure as a monk'; this construction is productive as we see in *popast' v rekru-ty* 'wind up as a recruit') attests to the fact that prepositional constructions lagged behind in adopting the new GApl.

Given the remoteness of the time frame and the low frequency of pertinent examples, we cannot argue that the GAdu served as the crucial stepping-stone to the GApl; however it certainly did provide a source for appropriate morphology to support the ultimate adoption of a GApl in East Slavic.

Judging from the data presented by Stanislav (1967:80–83; 100–101), the scenario of Slovak was probably similar to that of Polish. A single attestation shows the use of a virile GAdu in the fifteenth century: *sú přizvali k sebe ... dvú boženíkú* 'they summoned to themselves ... two councilors' (Žilinská kniha 1453). The virile GApl first appears in Slovak in the sixteenth century: *prosym yako panow a susedow millych* 'I beg you as kind men and neighbors' (Kremnické lis-ty, 1565). Like Russian, Slovak retains the old Apl *-y* in some prepositional phrases: *chod' v čerty, íst' v diably* 'go to the devil.'

In Upper Sorbian a virile genitive-accusative exists in both the dual and plural numbers, as opposed to an animate genitive-accusative in the singular. This sys-tem of distinctions is precisely the one suggested for Old Polish and Old East Slavic just before the loss of the dual. Even though Upper Sorbian retains the dual, it has replaced some of its morphology with plural counterparts; the ending associated with the virile GApl for nouns is *-ow.*

The absence of a GApl in Czech is an anomaly in North Slavic, and can be accounted for by two factors. One is that Czech alone resisted the otherwise common North Slavic tendency to reduce gender distinctions in the plural. East Slavic went the farthest toward reducing gender in the plural by universalizing *-am, -ami, -ax;* Polish generalized *-om, -ami, -ax* for all genders; and Slovak has moved in that direction, with a generalized pattern of *-am, -ami, -ax* for feminine and neuter paradigms, but *-om, -(a)mi, -ox* for masculines. Czech has shown no tendency to reduce gender distinctions in the plural oblique cases, concentrating instead on proliferating paradigms due to the *přehláska* sound changes of the twelfth–fourteenth centuries. Further, Old Czech lacked the NAdu ending *-a* for *o*-stems, having supplanted it entirely with the *u*-stem ending *-y* before our ear-liest attestations. Thus the Adu *-y* was syncretic with the Apl *-y* for all hard stem masculine nouns, and both endings could be paradigmatically associated with Npl *-i.* Therefore Czech dual morphology did not present a distinct nominative-accusative pattern to motivate the substitution of Adu by Gdu, which would have ultimately yielded a GApl.

In Polish and Russian the new GApl was initially implemented mainly in direct object position and generalized to accusative noun phrases governed by a

preposition. Aside from the difference in the date of the innovation, the two languages show differences in the extent to which GApl morphology was spread to numerals and in the further spread of the GApl: whereas in Russian the GApl was subsequently spread to all animates, Polish retained the GApl as an exclusively virile marker and extended it in that role to subject position (where the numeral is an obligatory part of the construction).

What has motivated these and the preceeding changes in the development of the North Slavic GApl? Indeed, what causes language change to proceed in the fashion we see here, with changes affecting case, number, gender, animacy, part of speech (as numeral, adjective, noun), and syntactic role (as direct object, object of preposition, subject)? Examination of this and other changes in the history of Slavic suggest an assortment of factors that feed into language change.

A sketch of linguistic change is presented below, informed by Andersen's (1973) model of abduction and subsequent deduction. According to Andersen, the task of the language learner is to abduce from the patterns available in the data those that are meaningful, and then to base his/her deductions on these patterns. This model can be augmented by theoretical advances made in cognitive linguistics — among others, the finding that human cognition (linguistic cognition included) is largely structured by categories defined in terms of a prototype and relationships to that prototype. If we apply Andersen's model in a cognitive framework, we must conclude that the learner not only abduces meaningful patterns, but more specifically that the learner abduces prototypes. Thus the learner abduces for his/her grammar concepts of the prototypical sounds (i.e., phonemes), of prototypical meaning units (morphemes), and of prototypical sentence structures (syntactic constructions). However, (a) *none of these abductions is made in a vacuum;* instead, they are all interrelated. Indeed, a change in a phoneme has repercussions throughout the language, for it alters the relationships that hold among phonemes in the language, the morphemes in which it appears, and thus the paradigms in which those morphemes appear, and even the constructions in which they are used. The interplay of morphology and syntax is clearly illustrated in the case study above. In addition to abducing specific prototypes, (b) *the learner must abduce various conceptual hierarchies* (cf. the hierarchy that places virile above animate above inanimate) and markedness patterns that link units in grammar. Furthermore, (c) *language changes tend to "conspire":* the development of a virility distinction in one part of the grammar motivates the use of further means to signal virility. For example, Polish and Slovak have not just one, but many ways of expressing virility (both languages have special virile endings for nouns and adjectives in the Npl, a virile third person plural pronoun *oni*, and a virile GApl; Polish further has a virile ending for the *l*-participle and two sets of virile numerals; Slovak has virile numeral forms as well, although most are not obligatory); whereas Russian has no marker that serves this purpose unambiguously (the only item associated with viriles in Russian, aside from the pan-Slavic masculine *a*-stem paradigm, is the collective numerals which, however, can also be used with *pluralia tantum* nouns and nouns indicating the young of animals).

It is the relationships that each linguistic unit bears to other units in a given

language that ultimately drive the direction of language change. When the learner abduces a prototype, s/he also necessarily abduces the relationships to that prototype of a variety of other units. In effect, this abduction creates possible paths for future language change. Imagine the prototype as the top of a hill surrounded by its sloping sides. A characteristic of the prototype may slide down these slopes, moving farther and farther from the prototype as it is extended to a variety of other units. Just as water will find a natural path down a slope, so does language change proceed down the slopes of the established hierarchies of linguistic categories. There is, however, no metaphorical equivalent of gravity in this model; abducted clines are merely possible paths that can motivate and facilitate, but not necessitate, change.

The development of the GApl presented here gives ample examples of such slippery slopes. The initial abduction, the one that led to the replacement of the Adu with the Gdu, was motivated by the same need to disambiguate the nominative from the accusative for viriles that fueled the innovation of the GAsg. When the dual was later lost, it was abduced to be merely a special plural (or at least non-singular), and this opened the way for its replacement by plural forms, first for adjectives (which lost dual agreement earlier) and then for nouns. Next consider the numeral. The use of the genitive with 'two' is further extended to the numerals most like 'two': the other adjectival numerals, namely 'three' and 'four' (etymologically Polish *trzech, czterech* are locative forms, but by the fifteenth century they had replaced the original genitives, partly because of the latter's syncretism with the nominative and partly due to the influence of GLpl syncretism in adjectives; a similar development accounts for the Russian *trex, četyrex;* further, 'three' and 'four' ultimately alter 'two' as well, causing the addition of final -*x* in both languages). The fact that the adjective already had genitive plural forms (also ending in -*Vx)* certainly had some effect on the development of the parallel forms in the adjectival numerals 'two', 'three', 'four'. In Polish this change has slid further: the Gdu -*u* morpheme has been extended to the numerals 'five' and up and to indefinites (*wielu* 'many,' *kilku* 'how many'), ultimately creating virile numerals.

Polish and Russian chose different subsequent paths, each in keeping with the trends of the given language. Whereas the new GApl remained restricted to viriles in Polish, in Russian it crawled on down the cline of the animacy hierarchy, moving to embrace animals and (because gender distinctions are reduced in the plural) females (where the presence of virile nouns in the *a*-stem paradigm probably facilitated the spread to *a*-stem feminines) and even neuters. Polish took the path of syntax instead, and extended the GApl marking to the other noun phrase directly involved in the action of the verb, namely the subject (until then nominative), yielding modern Polish virile constructions of the type *Przyszło trzech panów młodych i otworzyli drzwi* 'Three young men came and opened the door', where the genitive construction is triggered by the presence of a quantifier in subject position.

The following is a rough inventory of cline-creating relationships that can motivate language change in a similar fashion. Three basic varieties of abduction

are involved: (a) the abduction of ideal or prototypical shapes for general types of linguistic units, (b) the abduction of ideal or prototypical shapes for specific linguistic units, and (c) the abduction of hierarchies of linguistic phenomena.

(a) *The abduction of an ideal shape for a variety of types of linguistic units* can engender the spread of an innovation or constraints from the idealized prototype to items that deviate from it. Among the types of units affected and typical resultant changes are:

— the syllable, e.g., sonority and tonality adjustments in the ProtoSlavic syllable, where the ideal syllable had rising sonority and level tonality (Townsend and Janda 1996:50–93);

— the root, e.g., the constraint on roots that they consist of at minimum CVC preceding any desinence motivated the spread of *jest-* as a new "root" for 'be' in Polish, and the similar spread of *dad-, jad-* as new "roots" for 'give,' 'eat' in Macedonian and Bulgarian (Janda 1996a:67, 71);

— the affix, e.g., the fact that the old *o*-stem Ipl ending *-y* was the only oblique plural desinence consisting of only one syllable likely contributed to its replacement in all Slavic languages except literary Czech;

— the stem, e.g., the spread of the first person singular verbal desinence *-m* from athematic to non-athematic verbs was primarily motivated by abductions made about prototypical verbal stem shape in the various West and South Slavic languages (Janda 1996a:9–81);

— word, e.g., the structure of the word in East Slavic admits the reflexive particle, which has become bound to the verb, whereas in West and South Slavic it remains an enclitic, and the corresponding difference in the development of enclitic pronouns;

— sentence, here one could cite numerous syntactic changes motivated by an ideal structure of SVO, SOV, etc.

(b) *The identification of a prototypical shape for a specific linguistic unit* implies a relationship between that prototype and variant forms, facilitating spread from prototype to variants. The types of units involved in these relationships are:

— phonemes, e.g., both allophony, which is the relationship between the phoneme as prototype and its variant allophones, and inter-phonemic relationships contribute to the extent of phonological change; usually a change that involves the phoneme will also involve any allophones, unless they split off as separate phonemes, and phonological changes also commonly involve natural classes of sounds, so we are not surprised if, for example, a change in one velar is shared by other velars;

— morphemes, e.g., the *allo-l-eme* relationship is similar here, motivating analogical leveling both within and across paradigms;

— parts of speech, e.g., here we can cite the relationships between various items within the same part of speech, such as the adjectives and the adjectival numerals – as non-prototypical adjectives; as we have seen above, the morphology of adjectival numerals has been influenced by the morphology of prototypical adjectives;

— syntactic constructions, e.g., the prototypical syntactic construction of the accusative case is the direct object construction; as we have seen above, after the GApl was adopted for direct objects, it gradually spread to a less prototypical construction, the object of a preposition).

(c) *The members and rankings of various hierarchies* likewise lend themselves to abductive change. Among the hierarchies that establish clines directing linguistic change are:

— feature hierarchies, e.g., the differences in feature hierarchies in various Polish dialects and the resultant bifurcating changes documented in Andersen 1974;

— markedness hierarchies, e.g., the structure of markedness hierarchies and the tendency for features to spread along the lines of a markedness hierarchy have been explored in Janda 1995; note also the spread of the genitive-accusative from the highly marked virile to the marked animate, as opposed to the unmarked inanimate;

— category hierarchies, e.g., person, number, gender, tense, aspect, etc., where markedness is also relevant; above we have seen spread involving both number, specifically dual being absorbed by plural; and gender, in which the genitive-accusative spread from the least marked masculine paradigm to the more marked feminine and finally to the most marked neuter in Russian;

— conceptual hierarchies, e.g., non-linguistic hierarchies can become category hierarchies when grammaticalized; the distinctions of virile > animate > inanimate are part of a larger conceptual hierarchy that constitutes the figure-ground scale; much of the past millennium of change in Slavic substantival morphology has involved articulating distinctions along this scale in grammar, as documented in Janda 1996b.

To summarize: the act of abducing a meaningful unit necessarily entails the abduction of relationships between that unit and others, and these relationships pave the way for potential changes in language.

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NOTES

[1]   In the remainder of this paper -*i* and -*y* will signal the two original endings and their reflexes, referring also to concomitant oppositions in the preceding consonants and ignoring later phonemic and in some cases phonetic mergers of the vowels. As such, the discussion is limited to hard stems and parallel development in soft stems is considered secondary.

[2]   Note that the merger of original phonemes and the redistribution of letters by modern Polish orthography obscures the origins of *i* and *y*. For most examples the following rule allows us to recover the original vowel. Original -*i* is found in: *bi, ci, cy, czy, dzy, dzi, fi, ji, li, mi, ni, pi, rzy, si, szy, wi, zi, ży*. Original -*y* is found in: *by, chi, chy, dy, fy, gi, ki, ły, my, ny, py, ry, sy, ty, wy, zy*.