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The dynamics of bilingualism in language shift ecologies

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A large percentage of the world's languages – anywhere from 50 to 90% – are currently spoken in what we call shift ecologies, situations of unstable bi- or multilingualism where speakers, and in particular younger speakers, do not use their ancestral language but rather speak the majority language. The present paper addresses several interrelated questions with regard to the linguistic effects of bilingualism in such shift ecologies. These language ecologies are dynamic: language choices and preferences change, as do speakers' proficiency levels. One result is multiple kinds of variation in these endangered language communities. Understanding change and shift requires a methodology for establishing a baseline; descriptive grammars rarely provide information about usage and multilingual language practices. An additional confounder is a range of linguistic variation: *regional* (dialectal); *generational* (language-internal change without contact or shift); *contact-based* (contact with or without shift); and *proficiency-based* (variation which develops as a result of differing levels of input and usage). Widespread, ongoing language shift today provides opportunities to examine the linguistic changes exhibited by shifting speakers, that is, to zero in on language change and loss in process, rather than as an end product.

Keywords: endangered languages, speaker variation, attrition, shift

1. Introduction: Bilingualism in shift ecologies

A large percentage of the world's languages – anywhere from 50 to 90% – are currently spoken in what we call shift ecologies, situations of unstable bi- or multilingualism where speakers, and often younger speakers, are not using their ancestral language but rather speaking the majority language.

Such shift may be gradual or rapid, occurring over many generations or across a single one. The broad category of shift ecologies encompasses most immigrant communities; when the entire community is undergoing shift, we speak of language endangerment (Austin & Sallabank, 2011; Grenoble, 2021; Rogers & Campbell, 2015). Although the exact rates of shift and loss are debated, it is clear to linguists that a large number of the world's languages will cease to be spoken over the course of this century, unless radical efforts to offset and even undo language shift are undertaken. Indeed, a large number of languages are already dormant, or no longer actively spoken, and this trend is continuing.

Much work has been done on how to stop or reverse language shift (e.g. Fishman, 1991; Grenoble & Whaley, 2006; Hinton & Hale, 2001; Olko & Sallabank, 2021), yet relatively little work has examined shift as a linguistic process. Questions include core issues as how speakers in endangered language communities compare to other bilinguals, in majority language populations. Shift ecologies are dynamic: language choices and preferences change, as do speakers' proficiency levels. One result is high levels of variation of multiple kinds in these speech communities. Critically, we are interested in identifying if there are systematic differences between the linguistic systems of speakers in shift ecologies: *traditional speakers* who are highly proficient (L1) in a traditional, conservative (pre-shift) form of the language and use it actively; *attriting speakers* (alternatively referred to as *rusty speakers* or *rememberers*) who at one time used the language as an L1 but through disuse have forgotten parts of it; and *shifting speakers* (or *semi-speakers*).¹ We can further identify *innovative speakers*: they use the language regularly, in some cases it may have become their preferred language of communication, and yet their language, although systematic, exhibits marked differences from the traditional norm or baseline.

More research is needed to understand variation and shift in these situations. In the present epistemological paper, we focus on the core challenges in working with endangered language communities as examples of bilingualism and suggest some solutions. These are: (1) the challenges of identifying a baseline; (2) assessing and interpreting variation; and (3) generalizing linguistic trends over small numbers of speakers whose language abilities show high levels of variation. These are significant challenges in working with endangered language communities that affect our ability to answer the core questions fully.

We demonstrate changes in word order and case marking, drawing heavily on our own research in Indigenous communities in far northeastern Russia, focusing on Even (ISO 639-3 eve), a Tungusic language with an ethnic population of

1. The term semi-speaker is dispreferred today but was used historically (Dorian, 1977) and continues to be used today (Grinevald & Bert, 2011).

21,830 in 2010 (All-Russia Census). There are an estimated 4000 speakers today, with ongoing shift. Comparative data further come from Sakha (ISO 639-3 sah), a Turkic language. Sakha is regionally dominant in the Republic of Sakha (Yakutia), where Even is spoken today, but is a minority language in the context of the Russian Federation. It has a significant speaker base (of approximately 500,000), and provides a comparison to test methodologies and conclusions with a larger number of both L1 and L2 speakers. Experimental research with speakers of these languages provides empirical data to support our arguments, which are further bolstered by data from research on other languages.

We begin with a discussion of methodologies and challenges of research in endangered language communities (Section 2) and then turn to the issue of variation in these speech communities and speaker typologies (Section 3). We then move to a concrete exemplification of these phenomena. These languages are presented in more detail in Section 4, followed by a discussion of methodology (Section 5). Regional variation as a confounder is discussed in Section 6 and word order in 7. Section 8 concludes with a discussion of the findings and implications for future research.

2. Social and methodological considerations

Linguistic research in endangered language communities has largely focused on documentation and revitalization (while sociolinguistic research has tended to concentrate on the factors involved in language shift). Tremendous time and resources go into documenting endangered languages while they are still spoken, capturing the presumed last speakers whenever possible (Evans, 2001; Perley, 2012). The argument, and one that we support, is that it is important to make records of speech practices while still possible, to record grammars and lexicons by those who most proficiently use them, and to create corpora of these materials. Such materials have both scientific and social value, as they provide data for linguists and provide the foundations for any future revitalization efforts in the community. This research may provide a baseline sense of what the language was like pre-shift.

Language shift occurs when speakers cease speaking their home or ancestral language, replacing it with another, usually more dominant language. Shift ecologies are, by definition, bi- or multilingual. And yet the dynamics of that bilingualism are largely understudied, in part because of the race to document last speakers while still possible, and in part because of the focus on shift as opposed to understanding the dynamic multilingual practices of speakers as shift is taking place. Moreover, teasing out the effects of contact with and without shift is problem-

atic. Research on bilingualism tends to rely on quantitative data, with emphasis in particular in recent years on experimental methods. This has the advantage of achieving large amounts of roughly comparable data, enabling generalizations across speaker populations. Quantitative data present tremendous advantages in establishing patterns over groups of speakers but require relatively large numbers to be statistically rigorous.

While perhaps not completely unique to them, there are a number of challenges working in endangered language communities that have to be considered when conducting this research. They include the size and availability of the speaker base, which can make it challenging to record sufficient numbers of speakers. This is coupled with the very nature of endangered language communities where a range of historical, economic and social circumstances are often the root cause of language shift, and result in vulnerable communities.

2.1 Endangered language communities

Sample size is important in any quantitative study of bilingualism. Work with endangered language communities is challenging in this regard because the speaker base is often quite small. The size can range from a handful of speakers to thousands, but part of the nature of language endangerment is a reduced population size. This presents the very practical challenge of finding sufficient speakers for a study to meet the regular standards of statistical rigor. In fact, the standards that apply for majority language communities with millions of speakers cannot be applied in small-scale multilingualism, with or without shift, because of this fundamental problem (Lüpke, 2016).

In any study, only some speakers are willing and able to participate. In working with isolated endangered language communities, overall accessibility by the researcher is a further issue. As a very concrete example, there is no internet access in many of the villages where Even live; the Covid-19 pandemic and the wildfires of the summer of 2021 made work in many villages simply impossible. These are real and practical challenges. To be sure, some speakers move to urban centers where they are potentially accessible, but our experience is that a secondary wave of language shift takes place in cities. This is a widespread phenomenon and well-documented in many places of the world (Grenoble & Whaley, 2006; see Rozanova, 2019, for the Russian Arctic; Abtahian, Cohn, & Pepinsky, 2016, propose a means for modeling the impact). The urban minority population is generally so small that there is no local community to speak of; there are not ethnic neighborhoods that provide domains (such as local shops, places of worship, specialized schools) where the language can be used. Unlike large immigrant groups, Indigenous minorities rarely participate in metrolingualism (Pennycook

& Otsuji, 2015). Although such speakers do live in cities, in our own experience, they tend to be rusty speakers (or attriters), who have grown unaccustomed to speaking the language on a regular basis, regardless of their proficiency before moving to the city. This kind of generalization is not absolute, but is certainly a factor that should be taken into account in understanding the speakers' responses to any questions, tasks or stimuli.

It is important to keep in mind the histories of the people who are shifting to another language. Endangered language communities often come about as the result of stress or trauma; speakers may face psychological barriers to speaking their language. In many places, a segment of the population may be unwilling to work with linguists, due to unpleasant experiences with previous researchers. The late Darrell Kipp, Blackfoot leader and language activist, warned his community about engaging with such cultural hitchhikers and vampires, who take but do not give back (Kipp, 2000).

As a result, studies of language shift are often characterized by the description of the linguistic systems of a small subset of speakers, sometimes only one or two people. Fieldworkers often report what appear to be changes but often rely on single examples and cannot assess whether such changes are tied to an individual speaker and idiosyncratic, or one-time errors, or whether they represent systemic changes at the level of the speech community (Forker & Grenoble, 2021, p.283). Some work with endangered language speakers requires slow, one-on-one or small group elicitation and traditional fieldwork. The resulting speaker base will necessarily be small, due not only to the overall availability of speakers but also due to time constraints on both sides, for participants and researchers alike (see also Lüpke, 2010, 2016).

To mitigate this, we advocate a mixed methods approach. Beyond traditional field methods, which require time and often lead to intense work with just a few speakers, we also advocate adapting laboratory experiments to field conditions and the practicalities of working with people who must interrupt their daily activities to participate. Shorter experiments can be conducted on a larger scale since they require less time. This enables us to gather comparable data across a larger number of speakers. Nonetheless, we are dealing with small numbers. Some further adaptation is often needed to take into account the particular social dimensions and histories of any given population. Speakers may not be literate in the target language – for many languages there is no written form. So certain kinds of experiments are inappropriate if they rely on reading skills, such as word recognition or sentence production that relies on written words (such as our experiments, Section 5.2), self-paced reading tasks, or proficiency assessments. Perfetti, Van Dyke, and Hart (2001) discuss the connections between literacy skills and

psycholinguistics, flagging how low literacy skills are manifested in testing environments.

A major factor is the setting. Psycholinguistic experiments are typically conducted at universities, often involving university students as participants. They understand the setting and the overall expectations. The settings are radically different in endangered language fieldwork. First, it is important to consider how the context differs for speakers of minority Indigenous languages who are known to suffer historical trauma and are acutely aware of power differentials in the testing situation, or indeed in any institutional setting (Brave Heart & DeBruyn, 1998; Leonard, 2018; McKenzie, 2022). Such speakers may relive trauma in producing the experiments, and may have been actively punished for using their language in a school setting (Marr, 2000). Others experience shame at not being able to produce language, or are worried that they will give a “bad” form or make mistakes. Many are reluctant to speak even when they have volunteered to work with us.

Second, when we conduct experiments with speakers of Indigenous languages, we typically visit people in their homes, or sometimes set up base in a local house or apartment and participants come to us. It is often viewed as a social occasion, and a certain amount of conversation is expected. The speakers themselves often view their own role as more that of a teacher than a subject and tell us what they think we should know in order to learn the language, which often involves discussing possible variants. When participating in experiments, a picture or lexical stimulus often reminded a speaker, in particular someone of an older generation, of something that happened when they were younger, and this produced a story, or at least discussion of the lexical item.²

For these many reasons we do not calculate response time. It does not correlate to proficiency: often the highly proficient, traditional L1 speakers took the longest time to provide a response because they were sidetracked, or because their speaking style was slow and indirect compared to younger speakers. In this setting response time is more often an indication of how much experience and familiarity the participant has with these kinds of linguistic tasks. Participants with higher levels of formal education were more likely to be familiar with this kind of testing and completed the tasks quickly, while the traditional speakers tended to engage with the material in a different way and did not produce immediate responses, sometimes extending a sentence over several turn changes as they debated a verb tense. Any experimental methodology is in some way culturally anchored, and

2. The word for ‘ball’ provoked considerable discussion amongst more traditional Even speakers. The stimuli use *teβynken*, which has been replaced by a Russian borrowing (*mjačik*). Some speakers did not recognize the Even word; for older traditional speakers, it invoked memories of childhood games and an Even ‘ball’, made from leather.

field experiments need to take into account the particular social and historical setting(s) in which they are conducted.

2.2 Identifying a baseline

Establishing a baseline is critical in studying the linguistic effects of bilingualism; we cannot speak of change from X to Y unless we know what X was. If the parent generation is already undergoing language shift, the children are exposed to what they speak. In fact, the characteristic trait of rapid language shift is that the parent generation has ceased using the language and, if the children are exposed to it at all, it is through the grandparent generation (Fishman, 1991).

Establishing a baseline in endangered language contexts can be challenging. Speakers of endangered languages live in their territories and there is often no other stable community of speakers, in contrast to some other minority immigrant communities, for example. In working with endangered language communities, there is often insufficient research into what that baseline, input variety is. In majority language ecologies, varieties are often (even if inappropriately) assessed with regard to how they differ from a standard language. In some cases, there is a standard language, but it exists, and has only existed, as an artificial norm which was taught in schools, but not used by speakers. Documentation of spoken varieties consists primarily of traditional-style descriptions of phonology, morphology and syntax, and text collections of folklore. None of this captures the kind of colloquial speech patterns we would expect to be used in domains where the language is spoken, that is, none of it accurately reflects input. In other cases – as with Even – the standard language is similar to one or more spoken varieties, but differs in many respects from others. Standard Even is very similar to what is spoken in the village of Berezovka, where the language is retained and continues to be learned and used by at least some children in the village. In other villages, however, the local variety is markedly different, and thus regional variation confounds the analysis (Burykin & Sharina, 2021).

But determining what “pre-shift” means linguistically is challenging. Language shift ecologies are, by definition, communities where more than one language is used by speakers and where there is unbalanced bilingualism: one language is dominant, socially and linguistically. Even in cases of rapid shift and endangerment, where a language is lost over the course of a single generation, bilingualism of some kind probably maintained prior to shift. That is, there are ample cases where there was some level of bilingualism for generations, and then something changed in the social dynamics and shift began. In such cases where there has been sustained bilingualism at a community level, we do not find “pre-contact” speakers, even if we find monolingual speakers of the contact language.

A clear example of this is provided by Evenki, a language closely related to Even. Pre-shift borrowings from Russian were adapted to Evenki phonotactics, that do not allow word-initial consonant clusters or word-initial /r/, seen in such borrowings as Ev *ispička* ‘match’ (< R *spička*), and Ev *urbaška* ‘shirt’ (< R *rubaska*). The items (and their Russian names) were borrowed at a time when the majority of Evenki were still monolingual. More recent borrowings show a lack of adaptation to Evenki phonotactics, and even earlier borrowings have changed phonologically to match Russian more closely, as in earlier Ev *urubl* ‘ruble’ > modern Ev *rubl*’ (< R *rubl*’), where the earlier usage avoided word-initial *r*- found in the source language, and modern Evenki speakers simply use the Russian form.

2.3 Variation in endangered language communities

There is significant variation across communities and speakers in healthy and endangered language communities alike, but the sociolinguistic settings of the latter differ because they are under pressure from the dominant language and culture. This is a window of opportunity to study variation and change. In shift ecologies, not just language is lost, but also “certain culturally dependent types of variation or other important evidence about sociolinguistic principles and patterns that are disappearing forever along with these cultures” (Stanford & Preston, 2009, p.4). Social class distinctions, social hierarchies and orders, and social networks often differ radically in Indigenous minority communities and these distinctions are lost with assimilation to the majority. (Flores Farfán & Olko, 2021, make similar points.)

Variation in speaker proficiency is symptomatic of language shift. That is because one key diagnostic of language shift is when intergenerational transmission – crucial for language vitality – ceases. Children represent the future of a language: for a language to be vital, it must be used by future generations. In cases of rapid language shift, this loss can occur across a single generation: a language can disappear rapidly if there is a relatively small speaker base and all children cease learning the language at once. But in general, even rapid shift occurs unevenly across the larger community of all speakers, with some members continuing to use the language in the home even after others have given it up. Moreover, people have varying opportunities to use the language. Language shift ecologies are dynamic and show considerable variation, resulting in a continuum of speakers, in terms of acquisition, proficiency and usage. The small speaker base may only be a handful of any particular kind of speaker (along different lines of gender, age, proficiency, social status) for any given language. Shift does not happen evenly across communities, and the varying degree and pace result in variation in proficiency and usage.

One of the outcomes of unbalanced bilingualism in shifting communities is variation in the *linguistic systems* of speakers, alongside variation in their *proficiency*. Variation in shift ecologies is in general understudied: rather, work in endangered language communities tends to focus on documenting the “last” fluent speakers while still possible, although even identifying who “counts” as a speaker in such communities is problematic (Evans, 2001; Grenoble, 2021; Hill, 2002). Such work treats the language under study as if it were possible to document an idealized, and homogeneous language that elder generations spoke. A study of this variation is critical in understanding the kinds of linguistic changes that take place in shifting communities, and for how to distinguish different speaker types. We identify four large categories of variation: *regional* (dialectal); *generational* (language-internal change without contact or shift); *contact-based* (contact with or without shift); and *proficiency-based* (variation in proficiency in terms of production and/or comprehension). These categories are somewhat idealized and are not necessarily distinct; regional variation, for example, cuts across the other categories.

1. Regional variation may be unstudied or well-studied (or anything in between). For many endangered language communities, it is the only kind of variation that has been documented: such variation plays an important role in historical reconstruction. But it can also be a real confounder in the study of language shift when it has not been documented (prior to shift).
2. Generational variation, reflecting changes across generations of speakers. Here we use the label “generational” to distinguish language-internal change from contact-induced change.
3. Contact-based variation, or variation that is the result of uneven change due to contact. This unevenness often has to do with questions of diffusion: not all changes spread evenly throughout the community. This raises a number of questions: (i) What is the shelf-life of a change in rapidly shifting language ecologies? (ii) Does innovation spread across speakers or is it more idiosyncratic? (iii) And is there sufficient time in rapid language loss, which occurs over the course of a generation, for changes to be stabilized; (iv) Does a systematicity of innovative changes develop for the community of shifting speakers?
4. Proficiency-based variation: this kind of variation is characteristic of shift ecologies. Different speakers have different acquisition histories and different patterns of usage, in different domains and with different levels of frequency. Within a single community some speakers may use the target language on a daily basis, and another group has shifted to one of the majority languages. There is great variation even within the same family. In communities under-

going language shift, one typical pattern is that the oldest child acquires the ancestral language but younger children do not and speak the dominant, majority language. Proficiency-based variation may thus be found across members of a single family within a single generation.

There is some overlap between these categories, as proficiency-based variation often correlates with generational differences. Here we define these categories linguistically, in terms of the kinds of changes they represent. A key question in our work is how do we know when a variant is an established form used by a community of speakers (no matter how small the community) versus an idiosyncratic usage by one person, or a simple mistake by an individual speaker? We argue that this requires systematic testing of potential changes, which are often classified as mistakes. Variation as defined here interact with different types of speakers, as identified in Section 3.

3. Terminology: Speaker types and variation in endangered language communities

The phenomenon of language shift provides an opportunity to study language contact, variation and change across bilingual speakers of different types as it is happening. In shift ecologies we can begin by identifying three categories of speakers according to levels of language acquisition and usage: *traditional speakers*, *attriting speakers*, and *shifting speakers*. The latter group encompasses a range of different subtypes, varying according to level of exposure, age at which they started/stopped using the language, and other such factors.

We use the following working definitions:

Traditional speakers are the conservative speakers in a community; these are frequently (but not necessarily) representatives of the older generation, who grew up using the target language, fully acquired the linguistic system during the critical learning period, and actively use it. They are not always the oldest speakers; it is often the case that in not all communities undergo language shift at the same time or in the same way, and pockets of language users may continue to raise children speaking the language (and fully acquiring the linguistic system) even when the majority of the population is experiencing widespread bilingualism, dominance and/or shift to a majority language. Within endangered language communities, traditional speakers are the baseline speakers. In the communities we work in, monolingual traditional speakers are virtually non-existent; we know of only one monolingual Even speaker. That is, we do not find users of the language whose speech has not been affected by being embedded in contact ecologies. Identifying the baseline in endangered language communities is not a trivial task

(Section 3.1), and we can only hypothesize about what the speech of fluent speakers would be like if there were uninterrupted transmission without language shift. In many cases, “traditional” baseline speech is realistically the result of contact and shift. Note that in many communities, such traditional speakers are considered the “top owners” of the language (Flores Farfán & Olko, 2021, p.95), an ideology often found in Australian Aboriginal communities.

(Evans, 2001, pp.253–261)

Attriting speakers have fully acquired a language system but due to lack of use have forgotten parts of it (Schmid, 2011). Here we are concerned with speakers who lose linguistic knowledge but have normal cognitive functioning (as distinct from people with cognitive disorders who exhibit a decline in linguistic function for physiological reasons). We see loss across all linguistic levels, phonological, lexical, morphological and syntactic, and “stylistic shrinkage” (Campbell & Muntzel, 1989; Palosaari & Campbell, 2011). Attriters are often associated with emigrant populations who leave their homeland speech community to live in a place where another majority language is spoken, such as Spanish speakers immigrating to the US, or Turkish speakers to Germany. Attrition occurs at the level of the individual; although it can be widespread in a community (say, of immigrants), it is not an intra-generational process (unlike language shift, which occurs at the societal level). Such attriters have been equated with baseline speakers in work in immigrant language communities, and are distinct from heritage speakers.

(Polinsky, 2018, p.333)

Experience working with such speakers indicates that often the knowledge can be “reactivated” through increased exposure and usage (Rouvier, 2017, p.103; see also Chelliah & De Reuse, 2011, pp.176–178). That is, it is not lost, strictly speaking, but has become passive and forgotten. Such speakers are sometimes called “rusty” or “rememberers” (Grinevald & Bert, 2011, and references therein). More research into this type of speaker is needed, and how much knowledge can be reactivated and retrieved is an open question.

Shifting speakers

For the moment we take the term shifting speakers to refer to those community members who partially acquired the linguistic system of the target language but do not appear to have acquired the full linguistic system. They are distinguished from language attriters, who have forgotten parts of the system but remember it as they are (re)exposed to the language, especially if they have opportunities to reactivate their knowledge with other speakers. In our experience, the one group has more complex morphology and syntax while the second shows more leveling of forms (Kantarovich, 2020). These speakers use the language at best as an L2. Some spoke it as an L1 in early childhood but were then cut off from it due to displacement of some kind: one aspect of many (but not all) Indigenous speakers is that they were taken from their homes as children and put into residential

schools where they were punished for using their language. Without full linguistic biographies, it is hard to know if these children had achieved full fluency when they were sent to schools but at least the youngest probably had not; all were abruptly cut off from access to their families, language and culture.

(For discussion specifically focusing on the impacts on language in the Arctic, see Grenoble, 2018, pp.349–350)

The division into traditional, attriting and shifting speakers focuses on language loss. One characteristic that distinguishes many communities where language shift is taking place is language revitalization efforts. In such communities, some people make an effort to increase language usage and vitality. These efforts often involve both *shifting speakers* and *new speakers*, L2 learners of the language. They comprise a larger group of *innovative speakers*.

Innovative speakers: Shifters and new speakers

Both subgroups are made up of people who did not fully acquire the linguistic system as children; they may have stopped using the language as children or not have used it at all, learning the language only as adults. Acquisition may have been interrupted due to social pressures, increasing engagement with speakers of the majority language (in particular at school), or it may have come about as the direct result of trauma, including active repression of the language (often at residential schools, but also elsewhere).

In the case of language shift and endangerment, we find a range of speakers who do not fully acquire the linguistic system of the ancestral (target) language. Some later decide, often as adults, to learn and master their ancestral language. Such speakers are often associated with revitalization, and acquire the language through targeted programs or on their own initiative, and are often called *new speakers*.

We now turn to analysis of how the different types of speakers and variation interact but examining data collected in Even, which is spoken as a daily language by at least half of the population in only two villages today, Berezovka and Sebyan-Kyuyol. Considerable language shift was already underway at the time we conducted our research. A contrastive data point comes from the study of the regional majority language (Sakha) which has a larger speaker base, more L1 speakers, and less advanced shift. Note, however, that ethnic Sakha are also largely bilingual (in Russian), with increasing levels of monolingualism or Russian dominance (Ivanova, 2020).

4. Background: Even

To illustrate these arguments with concrete data, we draw on our research on Even, a Northwest Tungusic language. Even is spoken in the northeastern part of Russia, primarily in the Republic of Sakha (Yakutia), with smaller groups in some neighboring regions. The most recent Russian census was conducted in 2010, putting the total Even ethnic population at 22,383 and the number of speakers at 4911 at the time. The number of speakers was almost certainly inflated then and today is even lower, although there are some nascent revitalization programs working to create new speakers. Ethnic Even are shifting primarily to Sakha, the majority language of the Sakha Republic, and/or Russian, the national language. It is not uncommon to find people who ethnically identify as Even but speak both Russian and Sakha, or one of them, but know no Even, or have at most some passive knowledge. Even is robustly spoken in Berezovka and Sebyan-Kyuyol, which are relatively isolated from one another (Section 6). There is a strong correlation between Even who maintain an at least partial traditional lifestyle (of reindeer herding, hunting and fishing) and language maintenance. Herding families are most likely to speak the language, and the general depletion of herds (due to climate change and development) has an impact on language vitality.

A standard language for Even was established in the early Soviet period based on the Ola dialect, an Eastern variety. A written form was codified with first a Roman-based orthography, replaced by the Cyrillic alphabet in 1937. Today, Even receive some formal education in their language and all consultants were literate in the language, although there was some disagreement as to orthographic conventions. For example, the standard language uses the Cyrillic letter *x* to represent the pharyngeal glide /h/; some users instead prefer the Roman letter *h* to represent the same sound. One consultant in Bilibino (in far northeastern Russia) claimed not to recognize words written with *x* instead of *h*, showing the power of these ideologies. Nonetheless, the high literacy rates meant that we were able to use written stimuli in Even without difficulty. However, it would be mistaken to assume that the standard language can serve as the baseline for the language. It is not regularly spoken but rather exists as a school standard, except in Berezovka where the local dialect is close to the standard anyway.

To fill out the discussion we draw on data from Sakha. Both Even and Sakha belong to the larger Altaic family and are typologically similar, agglutinative, left-branching and head-marked. Language shift to Russian is found across both groups, and this provides us with an opportunity to look at the changes in structurally similar languages that are spoken with differing social settings. Russian is nationally dominant but Sakha is regionally dominant; some Even have shifted to Sakha but Sakha, as a general rule, do not speak Even (Grenoble, 2020).

4.1 A baseline for even

We use a combination of materials to extrapolate a baseline, traditional grammar. These materials comprise the available documentation, which in our case includes published descriptions, reference grammars, dictionaries and texts, which are primarily folklore. This is an imperfect data set. Reference grammars are written from a highly prescriptive, normative viewpoint that promotes only the artificial standard variety. In the case of our two target languages, the bulk of the descriptive work was conducted in the mid Soviet period, when a majority of the population used the target languages as their daily L1 languages. Extensive shift can be dated as beginning after World War II and accelerating with the break-up of the USSR and ensuing social and economic disruption in the 1990s.

Both languages have some descriptive and reference materials, in particular in Russian and some published in English. Pakendorf and Aralova (2020) provide a brief overview of Northwest Tungusic languages (Even, Evenki and Nedigal) in English and a list of relevant references in English and Russian. Sakha (also known as Yakut) is spoken by a larger population and has official status in the Republic of Sakha (Yakutia) and therefore there are more descriptive materials, including publications in Sakha. Published descriptions of Even provide a useful baseline account of the traditional (pre-shift) language, and include a number of descriptions of different regional dialects. Since the Berezovka dialect is very similar to the standard language, prescriptive grammars describe a variety that is very similar to what we would expect in traditional Berezovka and are a solid reference point.

Historically nomadic reindeer herders and hunters, Even are distributed over a vast territory and those who speak the language have limited interaction with speakers of other dialects because of isolation. Even scholars identify 24 regional dialects, or subdialects which are grouped into 13 larger dialect clusters (Burykin, 2004, p.85), but the differences are largely phonetic and mutual intelligibility is high. (That said, less proficient speakers in our study had difficulty with some lexical items that were based on the standard language/Berezovka dialect; Section 6). Regional variation is relatively well studied, with a number of published descriptions based on data recorded when the target variety was robustly spoken. These descriptions are critical in sorting out long-standing regional differences from recent innovations (usually due to shift).

Earlier and current fieldwork with speakers who are identified by the community as traditional, “good” speakers provide key information about what can be considered a baseline. That said, Even communities are bilingual or monolingual in a majority language; we know of only one monolingual Even speaker. A considerable amount of folklore in Even (and other Siberian languages) was recorded

during the Soviet period before massive language shift began; these texts can also serve as a baseline for what structures we would anticipate finding in narrative.

5. Methodology

Here we report on findings from studies conducted in 2017, 2019, and 2021. We use a mixed-methods approach involving traditional linguistic fieldwork, focused elicitation tasks, acceptability judgments and participant-observation; this is part of a larger, ongoing project studying morphosyntactic change and language shift and not all findings are discussed here. The same procedures were conducted with Even and Sakha speakers; the work we report on here investigates changes in word order and concomitant changes in other parts of the grammar. In this section we detail the tasks and the speaker populations. Work was conducted in the city of Yakutsk, the capital city of the Sakha Republic and home to approximately one third of its total population. Sakha comprise the single largest ethnic group in Yakutsk and in the Republic as a whole (at 49.9%, with Russians second at 37.8%). Research was also conducted in two villages in the Sakha Republic: Berezovka and Sebyan-Kyuyol, and in Bilibino, a town in the Chukotka Autonomous Okrug. Bilibino is known for high levels of multilingualism.

An overview of demographic information for each of these locations is presented in Table 1, which should be taken with some measure of caution. Data on ethnicity are self-reported and how individuals choose to represent their ethnicity changes is often dependent on political ideologies of a given time.

5.1 Procedures

Two focused tasks provide comparable data across speakers: (1) the Picture Production Experiment (PPE) and (2) The Bridge Story. These tasks have been used in part of ongoing research documenting language change and shift in North-eastern Russia (see Grenoble et al., 2019; Kantarovich, 2020; Kantarovich et al., 2021). Not all experiments and tasks were completed by all speakers owing to differing field conditions and differing levels of proficiency. Not all participants executed the tasks the same way: some older speakers preferred to consult with other speakers in the household. This is characteristic of much work with Indigenous participants who prefer to work collaboratively; many older speakers saw it as an opportunity to use the language and to teach the researchers. One schoolteacher requested copies of the experiments to use as pedagogical materials in teaching the language.

Table 1. Demographic information of field sites provide a major challenge for studying the linguistic systems of such shifting speakers

Location	Population	Ethnic data	Date	Notes
Republic of Sakha (Yakutia)	971,996	Sakha = 49.9% Russian = 37.8% Even = 1.6%	2022	
Yakutsk	341,221	Sakha = 50.6% Russia = 38.4%	2022 *	capital, largest city in Sakha Republic
Berezovka	318	Even dominant	2010 **	est. no more than 200 today
Bilibino	5777	Russian = 52.5% Chukchi = 26.7% Even = 2.9%	2022 ***	in Chukotka Autonomous Okrug
Sebyan-Kyuyol	774	Even = 85%	2021	Sakha and Russian are dominant languages

* Yakutsk: total population as of 2022; demographic data from 2010
** The 2022 census provides statistics only for the larger Srednekolymsk administrative region and not the individual village. Since 2010 there has been significant emigration from Berezovka to Yakutsk and other cities due to extensive flooding in the village. In 2019 residents estimated the population to be no greater than 200.
*** Bilibino data: <https://bdex.ru/naselenie/chukotskiy-avtonomnyy-okrug/bilibino/>

Two iterations of the PPE were performed, a pilot experiment with 14 pictures and a fuller experiment with 27 pictures. The 14PPE was conducted in 2017 as a pilot study. Our success led us to expand the stimuli. The 27PPE tests a set of verbal types: intransitive, transitive and ditransitive verbs; stimuli are provided in Appendix A. The stimuli were created by a native speaker of the Berezovka dialect for Even and a native speaker of Sakha in Yakutsk. Speakers of other dialects substituted some lexical items, but these did not change the total number of words, nor did they affect valency or argument structure.

In the PPE, speakers were provided with a single picture and a list of lexical items, in citation form, typed in a vertical column, beginning with the verb. They were asked to form sentences that correspond to the pictures using only these lexical items. The goal was to have speakers produce sentences that would be directly comparable to one another and free of context. Thus the pictures did not create a narrative or any kind of sequence of actions, but rather a set of unrelated sentences. A sample is given in (1) with the picture and Sakha stimuli as presented to participants, in Cyrillic with a ditransitive verb:

(1)



Even	Sakha	English
<i>haṇandaj tik</i>		'sew'
<i>ata</i>	<i>ebee</i>	'grandmother'
<i>asatkan</i>	<i>kyys</i>	'girl'
<i>aḥsun</i>	<i>bergehe</i>	'hat'

(2) provides an example of an intransitive verb:

(2)



Even	Sakha	English
<i>tuttej</i>	<i>süür</i>	'run'
<i>asatkan</i>	<i>kyys</i>	'girl'

No Russian translation was provided. Each set of stimuli begins with the verb, on the assumption that no speaker would begin a sentence with a verb. Speakers were constrained by the pictures and lexicon (although they were free to substitute variants for the supplied stimuli but were requested not to change them in any other ways, so that we had control of the target output. We independently tested spoken production across subjects using by showing them a short animation with music but no language, *The Bridge* by Ting Chian Tey, available online on You Tube.³ The video runs just over two minutes, making it long enough for a narrative but short enough for subjects to remember and not get bored. The plot is simple, involving four characters (a bear, a moose, a racoon and a rabbit) who try to cross a narrow bridge. Speakers were shown the video and asked to tell the story in the target language, and then again in Russian.

3. https://www.youtube.com/watch?v=_X_AfRk9F9w&t=34s

5.2 Participants

A total of 41 Even speakers and 50 Sakha speakers were recorded in the time period 2017–2021. All participants completed at least one of the two PPE and were asked to narrate the Bridge Story. 14 Even completed the 14PPE, and 27 completed the 27-picture experiment. The largest group of speakers was recorded in Bere-zovka (11 for the 14PPE; 20 for the 27PPE); the remaining speakers were recorded in Bilibino, Sebyan-Kyuyol, and Yakutsk. 4 Even participants self-identified as speakers but declined to participate in both experiments, stating that the tasks were beyond their capabilities. Sakha speakers were recorded in Yakutsk: 28 completed the 14PPE, and 28 completed the 27PPE and the Bridge Story.

Even participants were selected through snowballing (a sampling method where current participants help identify and recruit future participants), commonly used when the number of possible participants is small. Sakha participants were selected through snowballing and targeting students in specific university classes. We were able to work with more Sakha than Even because the speaker base is considerably larger. Ethnic Sakha comprise the majority of students at M.K. Ammosov North-Eastern Federal University (NEFU) in Yakutsk, where we conducted experiments in a controlled university environment. Some were tapped as part of a research component for a class, giving us access to a range of proficiency.

Work with Even was conducted at NEFU, and in private homes in the villages, with the researcher(s) traveling to each individual home. Older speakers spent a longer time over the experiments, engaging in more conversation and story-telling with the researcher(s). In particular the older speakers were likely to be reminded of incidents from their past, and enjoyed sharing these experiences. They often treated the experiments as an opportunity to provide language instruction to the researcher, rather than as an assessment tool. Some preferred to consult with other speakers in the household, some called a friend on the phone.

Although we had hoped to test more shifting speakers, many opted out, stating that they could not speak properly, and viewed the experiments as a test of their proficiency. We were able to record less proficient speakers when the experiments were tied to a university class but here too many opted out. Lack of confidence is widespread and provides a challenge for studying shifting speakers.

5.3 Coding procedures

All data were transcribed by native speakers of the target language and separately evaluated by a different native speaker. We coded order in terms of the position of the finite verb; all stimuli in the PPE aimed for the production of a single finite clause, but some Sakha verbs used a light verb construction (with a converb plus a finite light verb); none of the PPE stimuli were designed to elicit more than a single finite verb. However, sometimes speakers would create two clauses (with two finite verbs), in which case the order of each was counted. Some speakers read the stimuli before producing a sentence; we did not include their initial reading in our counts if it was followed by a sentence using inflectional morphology. Some speakers read the stimuli as their response, without inflectional morphology, either in the order presented with the picture, or with reordering. In such cases we included the sentence with its constituent order. This concerns a relatively small number of the Sakha speakers.

More widespread were repetitions and self-corrections; these phenomena warrant a separate study. We ignore these for the purposes of word order analysis but this means that the data are homogenized and do not give a full picture of proficiency. Speech rate is probably a more accurate single measure of proficiency (see also Polinsky, 2018).

6. Regional variation

Regional variation is traditionally classified as dialect differences, and the bulk of research on variation in Even has focused on such variation. While lexical variants may be the most obvious, the dialects differ in details of phonology, morphology and morphosyntax as well. Even dialects are generally classified into three larger dialect groups, determined by bundles of isoglosses that place them into the Eastern, Middle, and Western dialect groups (see Sharina, 2013). Our research was conducted in the villages of Berezokva (Ola dialect, #2); Bilibino⁴ (Lower Kolyma dialect, #8) and Sebyan-Kyuyol (Lamunkhin dialect, #7), Figure 1:

4. Bilibino is geographically closest to the Lower Kolyma dialect zone but the Bilibino dialect has not been sufficiently studied to be certain that it patterns the same way as other Even varieties in the Lower Kolyma.

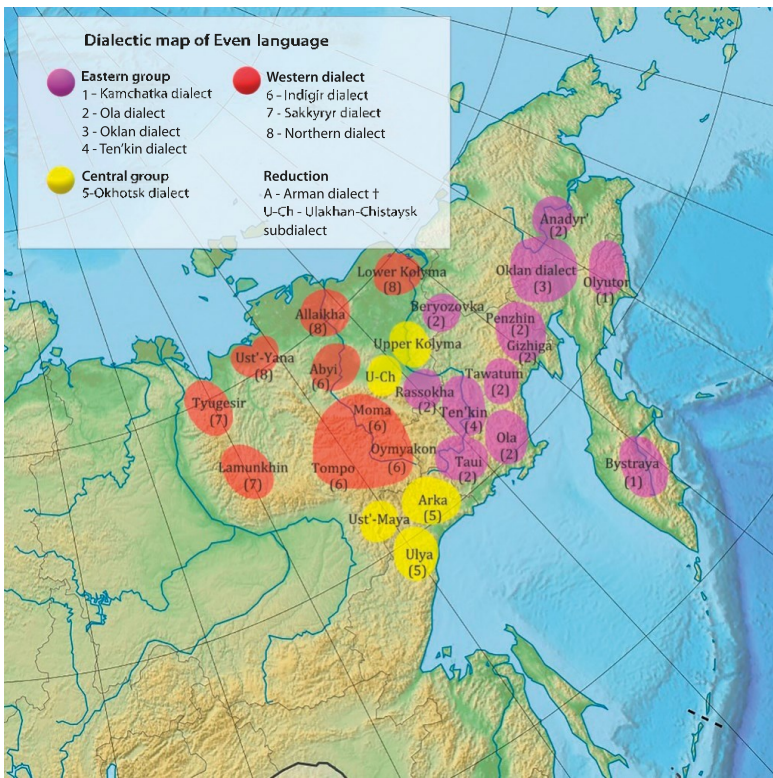


Figure 1. Map of Even dialects

Historically, Even were migratory, moving seasonally with domesticated reindeer over vast areas of northeastern Eurasia to feed their herds. Small groups of Even were dispersed over large geographic areas, resulting in considerable regional variation despite the small population size. As seen in Figure 1, they are distributed all over far northeastern Russia, living at great distances from one another: Sebyan-Kyuyol and Berezovka are approximately 1200 kilometers apart as the crow flies, with no direct route between them.

Regional variation can (and does) confound the analysis of other kinds of variation; phonological, lexical and grammatical differences are found. Two examples are provided here: (1) the instrumental case ending; and (2) the marking of the past tense. Both are illustrated in Example (3). Standard and Berezovka Even use a past tense formed with the suffix *-ri-* and the instrumental case is marked with *-č*. In contrast, in Sebyan-Kyuyol the past tense marker is *-čā* and the instrumental *-t*. The suffix *-čā* is actually a past participle form which is used with person markings for a past tense in Western dialects, although there is no (Burkyin and Sharina, 2021, p.284). These different variants are seen in (3a–c);

the Berezovka dialect aligns neatly with the standard variety, and Sebyan-Kyuyol is the outlier:

- (3) a SE *Bej* *čeŋeč-ič olra-β hepken-dej manru-ri-n*
 man-nom rod-inst fish-acc catch-cvb.purp try-pst-3sg
 b Ber *Bej* *čeŋeč-ič olraβ hepkendej manrurin*
 c SK *Bej* *čeŋeč-et olraβ hepkendej mandu-ča*
 ‘The man tried to catch a fish with a fishing rod’

An older speaker from Bilibino also uses the instrumental in *-č* but her use of word order is innovative, both the direct object and oblique instrument follow the verb:

- (4) *Bej hepken-re-n oldra-β olra-β čeŋeč-ič*
 man-nom catch-prs-3sg fish-acc fish-acc rod-inst
 ‘The man catches a fish a fish with a rod’

Example (2) also shows her vacillation between two forms of the word for ‘fish’, one using the C cluster *-ldr-* versus *-lr-*, which is typical of eastern dialects (including the standard). In contrast, in western dialects we expect to find *-ld-* (*olda* ‘fish’). The use of the cluster *-ldr-* in *oldraβ* combines both eastern and western traits; we assume it is a mistake here (and the speaker does self-correct). This points to the overall challenge of regional variation: without a full description of the pre-contact variety, it can be impossible to tease apart language-internal variation from change due to shift.

Regional variation in any part of the system presents a particular challenge in understudied languages because it is often undescribed and, with limited traditional, conservative speakers of any given variety, may not be identifiable.

7. Word order in even and Sakha

Word order was chosen as our first area of focus for several key reasons: it is readily measurable and testable, and is well known to be susceptible to changes due to contact (Heine, 2008). At the same time, it is generally not used to index social identity (unlike phonetic variation, for example), meaning that word order variation would be unlikely to have social significance and would rather be indicative of structural change.⁵ Field linguists working with Indigenous languages in

5. A counterexample is in Potawatomi, an Algonquian language being actively learned by L2 new speakers in the US today. Kasper (2022, p.5) argues that speakers ascribe positive social capital to avoiding English word order, and increasingly avoid it as proficiency improves.

contact with Russian have anecdotally reported changes in word order but it is unclear to what extent these changes are systematic across speakers. One goal of our work has been to examine whether changes in word order have diffused across the speech communities, and whether they occur concurrently with other changes in morphosyntax.

In contact situations, the outcome of word order change is conditioned by the linguistic constraints of the original language (Hopp & Putnam, 2015). Much of the research to date has focused on scenarios where the dominant language has more rigid word order than the L2 language. The opposite holds here. Even and Sakha are head-final languages with relatively rigid V-final orders (Malchukov, 1995; Stachowski & Menz, 1998). Russian word order is largely determined by information structure, although unmarked word order is clearly SVO. Corpus studies have shown SVO to be the most frequent order by far, accounting for up to 89.6% of all orders involved S, V, O in a sample of 500 sentences; V-final orders (both SOV and OSV) account for only 6.2% (Billings, 2015; see also Bailyn, 2012, 237–291).

Word order changes under Russian influence have been reported for other languages. Golovko (2009, pp.22–21) reports word order changes in Aleut; Saj (2009, p.707) notes that younger Kalmyk speakers have a tendency to place dependent clauses after the main clause instead of before it, as in traditional Kalmyk; and Volodin (1994, pp.338–339) argues that Itelmen word order changed from SOV to SVO under Russian influence, citing examples going back to the 19th century. Other studies are potentially indicative of typological restructuring: North Russian Romany exhibits at least the occasional use of prepositions instead of postpositions (Rusakov, 2004). Similarly, Udmurt (Uralic) was historically non-rigid V-final (Aszatalos, 2021, pp.154–155), but recent research shows a generational difference with younger speakers finding head-initial word orders more acceptable than do older speakers. This is a shift in the nature of bilingualism, from Udmurt-dominant to Russian-dominant, and interprets it as a sign of ongoing typological restructuring from OV > VO.

Turning to the Even data, we hypothesized that under Russian influence, the verb would move forward and be less likely to occur in final position than in traditional Even, and that there might be some further syntactic restructuring concomitant with word order changes. We also predicted that speakers would be more likely to use V-final orders in the PPE, as they were presumably planning each utterance based on the stimuli and pictures and would be conscious of ordering rules. We found considerable variation in the responses.

With ditransitive verbs any ordering of S-O1-O2-V is theoretically possible, where S=Subject, O1=Accusative Direct Object, O2=other oblique, and

V=Verb. Specific examples of all possible orders occur in responses from the 27PPE, in (6a–d):

- (6) (a) S-O1-O2-V *Asatkan ŋin-u ulre-č ulič-d-de-n*
girl-nom dog-acc meat-inst feed-ipfv-prs-3sg
(b) S-O2-O1-V *Asatkan ulre-č ŋin-u ulič-d-de-n*
(c) S-O1-V-O2 *Asatkan ŋin-u ulič-d-de-n ulre-č*
(d) S-V-O1-O2 *Asatkan ulič-d-de-n ŋin-u ulre-č*
'The girl feeds the dog meat'

In traditional Even, V-final word order is unequivocally preferred. There is some debate as to whether the order in (6a) of O1-O2 is preferred or more frequent than (6b) O2-O1 in traditional Even, but the speakers we worked with evaluated (6a) as more correct, preferred, or better.

The results of the 14PPE and 27PPE in Even show some changes in word order across speakers, with more traditional speakers more likely to produce all V-final orders and both attriting and shifting speakers less likely. We find some changes in case marking and more extensive changes in verbs across speakers who use more VO order in our experiments.

14 people completed 14 PPE in Even; each picture-stimuli set corresponds to a single sentence-response, for a total of 196 sentences across all speakers. Of the 14 stimuli, no single picture elicited all V-final orders. 7 speakers (or 50% of all participants) use some non-final V orders; 1 speaker uses all VO order in all 14 sentences. But there is a considerable range, and half the speakers do produce all V-final. In the 27PPE, a similar pattern emerges, where less than half of the speakers use V-final order only, summarized in (7):

(7) *Non-V-final orders in Even PPE*

14 PPE		27PPE	
N=14		N=22	
Speakers	VO	Speakers	VO
1	14	1	13
1	8	1	10
1	5	3	5
1	4	1	4
1	3	1	3
2	1	3	2
		3	1
7	0	9	0

Still, the counts mask a more complex situation and homogenize variation. For example, for one speakers who produced 5 VO-clauses, 4 occurred as repetitions of previous OV clauses, as in (8):

- (8) a. *Hukle-d-d-en hurken-Ø*
 sleep-ipfv-prs-3sg boy-nom
 b. *Hurken-Ø hukle-d-d-en*
 boy-nom sleep-ipfv-prs-3sg
 ‘The boy sleeps’

It is hard to know if this is a self-correction or repetition for emphasis; in other instances, the first token is V-final and in the second, the V moves forward. If we omit these repetitions, then this speaker has only 1 instance of VO order, but that erases what could also be word order variation. This particular speaker is a male reindeer herder whose first language is Even; he completed 11th grade and is best considered a traditional speaker (and not a shifting speaker, as the word order might suggest). And yet he shows innovative word order.

Responses of only 22 of the 27 total participants are provided. Five were omitted as not meaningful in this count: their responses extended over several turns, or they failed to create sentences that corresponded to the stimuli, or did not provide clearly formulated sentences. In addition, some of the speakers provided more responses than anticipated. Regional lexical variants were stumbling blocks for some, even when they were defined. Much of their time is spent discussing not only individual lexical items but also verb forms, creating different tenses and trying them out.

Use of inflectional morphology (nominal and verbal) is largely intact, with some deviations from traditional, expected norms (Section 7.3). The patterns suggest a split between innovative speakers who use at least SVO order, and more traditional speakers who use SOV. An individual speaker's constituent order in the PPE largely correlates with constituent order in the Bridge Story. That is, we did not find a significant change between the two tasks with the exception of one speaker, who used VO order 8 times in the 14PPE, but produced V-final order in 22 out of 25 clauses in the Bridge Story. But this speaker's narrative is characterized by considerable code-mixing, repetitions, and false starts. This underscores the hazards of analyzing the texts based solely on constituent order and the challenges of counting.

In sum, in Even there was some change toward VO order although it is not absolute, and there is great variation across speakers. Many speakers (both traditional and innovative) used exclusively V-final orders, adhering to the traditional norm even when there were mistakes in other parts of the grammar. Even speak-

ers with VO order are likely to maintain case, using not just core cases but also spatial cases and relational nouns.

7.1 Word order and shift

Are changes in word order an indication of shift? Not necessarily. We find speakers with innovative word order and traditional morphosyntax. But there are some correlations. It is informative to closely examine the subset of speakers living in Yakutsk, the capital of the Sakha Republic with a population of approximately 336,000. Urbanization is a known driver of language shift, and Even living in Yakutsk lack a local community to use their language. So we would anticipate finding less proficient speakers in Yakutsk than in Berezovka, where language retention, intergenerational transmission and daily usage are known to be high.

Four Even speakers living in Yakutsk completed the 27PPE; all produced only V-final sentences. Two are university students and two are women in their mid-50s. One university student considers herself an L1 speaker of Even and the other an L2 (weaker speaker). The two women consider themselves L1 speakers of Even but have limited opportunities to use the language on a daily basis in the city.

The L1 student made no mistakes (as evaluated by two native speakers of Even). All other speakers made mistakes in verbs, ranging from a low of 3 mistakes to a high of 7 mistakes by the L2 student. (Noteworthy here too is the fact that she completed only 25 of the 27 stimuli.) Her mistakes in verbs are systematic, using the present progressive with verbs that do not take it in traditional varieties. This is an overextension of the forms and morphological levelling, a kind of change associated with shifting speakers (Palosaari & Campbell, 2011, p.113); Kantarovich (2020) shows similar changes in Chukchi shifting to Russian.

This same L2 speaker shows some changes in word order in her telling of the Bridge Story; one example is given in (10):

From the Bridge Story, L2 Even speaker, recorded in Yakutsk, age 19:

- (9) *Toki-Ø munruka-m ilbehen-če-Ø mosta-duk.*
 moose-nom hare-acc chase-pst-3sg bridge-abl
 'The moose chased the hare off of the bridge.'

Finally, we do find innovative word order in the Bridge Stories, in correlation with those speakers who use it in the PPE. A striking example is presentational word order, as produced by a traditional speaker who begins the story as in (10), compared to the first line of his version of the story in Russian in (11), versus the opening by an innovative speaker in (12):

From the Bridge Story, traditional speaker, recorded in Berezovka, age 43:

- (10) *ömneken egdzete-Ø nakat-nun most-la bakaldar-Ø*
 one.day moose-nom bear-com bridge-loc meet-prs-3pl
 'One day a moose and a bear meet on a bridge.'
- (11) *kak-to raz vstreti-lis' na most-u los' s medved-em*
 somehow once meet.pst.3pl on bridge-loc moose with bear-prs-ins
 'Somehow once a moose and a bear met on a bridge.'

Innovative speaker, recorded in Bilibino:

- (12) *ñened-de-Ø mosta-Ø oj-li-n egdzete-Ø taduk nakat-Ø*
 stroll-prs-3pl bridge-nom top-prol-3sg moose-nom and bear-nom
 'A moose and a bear were going along the top of a bridge.'

The word order in (12) replicates Russian presentational word order, placing new information at the end. Traditional Even speakers reject it as "very bad" (in contrast to Example (9), where the order is simply dispreferred. But the speaker in (12) proficiently uses morphology and considers herself an excellent speaker.

7.2 Word order, shift, and Sakha

28 Sakha speakers completed the 14PPE and a different 28 speakers completed the 27PPE. As with Even, we do find speakers who produce all V-final utterances. Some produce an occasional sentence with VO order. Yet a number of the speakers produce no V-final orders and, in contrast to the Even cases, such speakers show case loss. Less proficient speakers repeated the stimuli with little or no inflectional morphology; one did not always use all the stimuli, see (13)–(14):

- (13) target: 'The girl feeds the dog meat'
Iti kyys aa Iti kyys aa aġa yt-yty aġa-byt.
 dem girl aa dem girl aa father dog-poss.1.pl father-poss.1.pl
- (14) target: 'The man gives the boy a fish'
Bier ere balyk uol uolan-y Nu ja moġet nepravil'no govorju uo
 give please fish boy boy-acc well I maybe incorrectly speak.prs.1sg
uolan-y
 boy-acc

Examples (13) and (14) illustrate the kind of language production we find across low proficiency shifting speakers. (13) shows hesitations and repetitions as the speaker tries to formulate a sentence; he seems to have confused the stimulus *ahat* 'feed' for *aġa* 'father', suggesting that he does not hear the difference between the

voiceless velar fricative *ahat* (Cyrillic *aham*) and the voiced velar fricative in *aġa* or does not interpret Cyrillic *а* (аа) as a voiced velar fricative), a letter not used in Russian. In (14) he simply repeats words, and then switches to Russian in line 2 with meta-commentary.

We do not have such examples in the Even database. This does not reflect more advanced Sakha language shift, but rather that we were able to record more less proficient Sakha speakers. This is almost certainly because we were able to directly recruit Sakha students as part of a class at the university.

Turning to constituent ordering, we find that in both the 14 PPE and the 27PPE, the overwhelming majority of clauses were V-final. Only a handful of speakers produced non-V-final clauses, with only 1 speaker (27PPE) and 3 speakers (14PPE) producing more than 2. Summarized in (15), 6 speakers produced 1 each in both of the experiments, and 3 of these tokens in the 27PPE came toward the end of the experiment, suggesting speaker fatigue may have been a factor.

(15) Non-V-final orders in Sakha PPE

14 PPE N=28		27PPE N=29	
Speakers	VO	Speakers	VO
1	11	1	8
1	5	2	2
1	3	6	1
1	2	20	0
6	1		
18	0		

Moreover, only one stimulus resulted in more than two tokens of non-V-final clauses; this was Picture 16 (Appendix), for the target *The boy writes a letter with a pencil*. In all four instances of an argument following the verb, it was the instrumental *xarandaah-ynan* ‘pencil-inst’, or ‘with a pencil’.

In contrast to the Even sampling, there is a correlation between word order and morphology. The speakers in the 14 PPE lowest numbers of V-final sentences also used less inflectional morphology: S-32 uses VO in 11 out of 14 sentences and consistently uses only the stimuli as presented in the experiment, in citation form; S-7 similarly uses just the stimuli in 4 instances.

In general, V-final word order is more robustly maintained in Sakha than in Even. At the same time, we were able to record 3 shifting speakers (2 in 14PPE and 1 in the 27PPE); the 2 shifting speakers in the 14PPE (S-32 and S-7) have overall

lower proficiency and less command of morphology. This is not to suggest that such speakers do not exist for Even, but rather that we failed to record them.

7.3 Nouns and case marking

Word order is known to interact with other morphosyntactic features, including the case marking-system. The two are loosely correlated: languages with more flexible constituent order also tend to use morphological case marking to signal grammatical functions. We might anticipate that speakers bilingual in Russian will be maintain the case system in their ancestral language. Contact does have an effect on case: in Northern Romani (Rusakov, 2004, p.25) all cases follow the same pattern as Russian, which in some instances has resulted in Northern Romani being more conservative than its sister languages. At the same time language loss is generally associated with a reduction in case marking (Palosaari & Campbell, 2011, p.115), although they argue that it is generally accompanied by a move to more rigid word order.

In our data set case marking is well-maintained except by shifting speakers who seem to know no case, with some exceptions. One is the accusative case. We would not expect the accusative case to be lost as it marks a core argument, is relatively high frequency (in marking the direct object or patient of transitive verbs) and is also morphologically marked in Russian.

However, we find a number of errors in the marking of the accusative in our sample. One speaker overextends the accusative suffix *-u* in Even, seen in the marking of *asatkan* 'girl' in Example (1). This is an overextension of the accusative allomorph *-u* which occurs after stems ending in a consonant (*okat* 'lake-nom' *okat-u* 'lake-acc'); for nouns ending in *-n*, the expected ending is *-m* (*asatkan* 'girl-nom' *asatka-m* 'girl-acc'):

- (16) *Asi-Ø* *asatkan-u* *irit-te-n* *hupkuči-d-de-n*
 woman-nom girl-acc cook-sup-3sg teach-impf-prs-3sg
 'The woman teaches the girl to cook'

There is probably a dual source for this error: one is an overextension of the Even accusative allomorph *-u*, and another is interference from Russian, where the accusative feminine singular is *-u*. There is no grammatical gender in Even, but the noun here denotes a female person and so the use of *-u* makes some sense. This same speaker forms the accusative with the suffix *-u* on other nouns ending in *-n*, such as *teβeken-u* 'ball-acc' instead of expected *teβeke-m* (nominative *teβeken*).

This is not the only speaker to deviate from the expected, traditional norm for the accusative. A zero marking is seen on the noun *asatkan* ‘girl’ in (17), from the same stimuli:

- (17) *Asi-Ø asatkan-Ø irit-te-n hupkuči-d-de-n irit-te-n*
 woman-nom girl-nom cook-sup-3sg teach-ipfv-prs-3sg cook-sup-3sg
hupkuči-d-de-n
 teach-ipfv-prs-3sg
 ‘The woman teaches the girl to cook’

Interference might come from either Russian or Sakha: both have differential object marking in the accusative which may be a source of interference. Given that many Even know both languages, this seems likely.

In the PPE we are most likely to find variation in case marking in ditransitive verbs. This zero marking is found in other test sentences as well, but there is variation in the mistakes. Consider the target *The woman is sewing a hat for the girl*. In traditional Even, the hat would be marked accusative and the girl dative as indirect object. There was variation in the marking of the recipient: three people used zero marking, one accusative, nine the dative and one person simply omitted it from the response. Thus if there is an innovative form, there is a slight preference for zero marking, which may indicate a loss of case, or rather just a repetition of the stimulus (which is given in the citation form) because they could not remember which case to use in this construction. (The same speakers produced the dative case in other sentences).

In the weakest of speakers, the mistakes in case forms do not appear to be systematic, either across an individual’s production or across speakers. They are an indication of decreased proficiency. Other shifters with higher proficiency make mistakes, and there is some systematicity across them. They are opposed to either attriters or traditional speakers, who do not make them. Where traditional speakers use an unexpected case form, they immediately self-correct.

Note that we find fewer mistakes in case forms, or fewer deviations from expected norms, in the Bridge Stories than in the PPE. There are two reasons for this. First, the speakers with low proficiency simply opted out of the task as it was too difficult for them. Second, there are few constraints, and so speakers could formulate sentences as they liked. Many had difficulties with lexical recall, and there are hesitations, repetitions, false starts, and code-switches into Russian.

8. Discussion

Based on performance in these tasks, traditional speakers perform with little to no deviation from the grammars as described in standard references. They are baseline speakers and can easily be distinguished from shifting speakers in our study, who show signs of dysfluency including hesitations, repairs, and switching into Russian. Consider the following excerpts from a Bridge Story as told by an Even woman who has been living in Yakutsk for 30 years. The story is marked by a number of dysfluencies, including repetition of words, first in (18a) in citation form (the nominative case), with the Russian stem *most-ø* 'bridge-nom', repeating this twice, and then again in the dative case (with the Even stem *mosta*), and repeated in the dative in (18b):

- (18) a. *most-ø ə most-ø mosta-du taduk*
 bridge-nom eh bridge-nom bridge-dat then
 'The bridge... eh... the bridge... on the bridge then ...'
 b. *mosta-du taduk munrukan-ø ʃan barsuk-ø*
 bridge-dat then hare-nom and badger-nom
 c. *ʃan-da bargi-la hör-dej ʃek-če-l*
 again=conj opposite-loc go-cvb.purp want-ptcp.pst-3pl
 'then on the bridge, the hare and the badger again want to go to the opposite side'

The extensive use of the conjunctions *taduk* 'then' and *ʃan* 'and' in this excerpt is another indicator of lower proficiency. The same speaker clearly has some difficulties with lexical recall, switching into Russian when she cannot remember a word:

- (19) *taduk barsuk ja-ča-ø nakloni-l-ø-sja...*
 then badger what-ptcp.pst-3sg bend.over-pst-m.sg-refl
 'then what did the badger do... he bent down...'

The interrogative *jak* 'what' is used felicitously with derivational morphology to create a verb meaning 'do what', suggesting high proficiency (no such verb can be formed in Russian), but the speaker then switches to Russian for the forgotten word.

Code-mixing is another indication of proficiency and accessibility of the target language. Shifting speakers are not balanced bilinguals; they show a strong preference for speaking Russian and do not draw on a multilingual repertoire. The traditional speakers use Even as the prime, matrix language, with limited to no code-mixing, in completing tasks and in addressing the Even-speaking researchers. When asked to perform a task solely in the target language, they do.

In contrast, shifting speakers perform the task in Even, but where there is code-mixing, Russian is the matrix language. Forgotten lexical items are inserted in Russian word, not paraphrased in Even. Meta-commentary about the task is in Russian. Use of Russian increases toward the end of the task (after the first 20 or so sentences in the 27PPE and toward the end of the Bridge Story narratives as speakers tire. Some abandon speaking Even for the last couple of lines, and many conclude the Bridge Story by switching into Russian and stating ‘that’s all’ or ‘that’s the end’, even when the researcher has been speaking to them exclusively in Even.

With shifting speakers, the elicited narratives and the PPE are characterized by frequent usage of Russian as a metalanguage, making commentary about the task itself or the speaker’s own performance, for hesitations, and in cases when the speakers seem to be addressing themselves when searching for a word or a word form. That is the general impression is that the speakers are thinking in Russian, even if they are not switching codes or using much Russian at all. In testing lexical recall of body part terminology as a proxy for a proficiency test, speakers searching for a word often used the word in Russian while thinking, as in (20), uttered by an Even speaker:

- (20) **lokot’... lokot’... kak že budet lokot?**
 elbow elbow how emph will.be elbow
 ‘elbow...elbow... how do you say elbow?’

This suggests that some speakers are mentally translating from Russian to Even as they perform the task, highly indicative of unbalanced bilingualism and shift.

Although we can distinguish traditional speakers from shifting speakers, we currently lack clear evidence of systematic differences between attriting speakers and shifters. More data is needed to see if we can identify changes in the linguistic systems between the two, and whether this is a useful distinction to make. The PPE experiments highlight some of the benefits and the disadvantages of a controlled quantitative approach. In designing the PPE, we had hoped to obtain directly comparable sentences across speakers of different ages, backgrounds, and proficiency levels. Ideally, we would be able to sort responses according to conservative versus innovative systems, and to identify shifting speakers by their use of forms. Experiments conducted in university settings, coupled with demographic information collected in sociolinguistic surveys, by and large enabled us to correlate responses with speaker type. But in the villages, and in particular with the group that both self-identifies and is recognized by the community as “traditional” had a strong tendency to engage with the PPE stimuli in ways that left their answers not directly comparable. Several objected to Picture 15 (target: *The boys are planting a tree in the yard*), not because of the lexical items, but because the

trees depicted in the drawing were too large to be planted, arguing that the tree was already growing. Similarly, Picture 13 (target: *The man shoots a walrus on the ice*) drew objections because the speakers live inland and there are no walruses. One speaker from Sebyan-Kyuyol declined to produce a sentence for Picture 2 (target: *The boy swims*) because she did not recognize the word, started to supply a word from her own dialect and then noted that the river there was too cold to swim in anyway. These responses do not surprise fieldworkers, but they do not provide grammatical information.

Significantly, strict experimental methods, aimed at providing snapshots, are not always directly applicable in our field settings and are not sufficient on their own to understanding variation and change. One of the key takeaway messages of the analysis here is the problematic nature of analyzing change in endangered language communities with only quantifiable data, which do not capture the full complexities of the situation. Future research in these communities can do more to identify the nature of language shift, and to study whether the grammars of shifting speakers differ in predictable ways from those of attriting speakers. Polinsky (2018, p.333) argues that in heritage language work, usually a quick interview will distinguish the two. We are not so sure that is the case in endangered language communities where attriting speakers may experience significant trauma in using the language (and thus appear to be shifters). Moreover, work with both groups of speakers shows that working with the attriters can reactivate parts of the language that they do not remember due to lack of use, and work with shifters can improve their proficiency as they learn the grammar, and the lexicon, together with the researcher. Finally, we note that Schwedhelm et al. (2022) refer to Indigenous, endangered heritage languages, suggesting a commonality with heritage immigrant languages. This is a fruitful area for future research.

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Appendix: Stimuli for 27 PPE, even and Sakha

Note: lists were randomized before actual testing

	Even	Sakha	English
1	<i>hedžedej</i>	<i>üŋküülee</i>	dance
	<i>beil</i>	<i>džonnor</i>	people
2	<i>tjamattaj</i>	<i>sötüölee</i>	swim
	<i>hurken</i>	<i>uol</i>	boy
3	<i>tuttej</i>	<i>süür</i>	run
	<i>asatkan</i>	<i>kyys</i>	girl
4	<i>hukledej</i>	<i>utuj</i>	sleep
	<i>hurken</i>	<i>uol</i>	boy
5	<i>göbedej</i>	<i>timir</i>	drown
	<i>hurken</i>	<i>uol</i>	boy
6	<i>tiktej</i>	<i>oğut</i>	fall
	<i>hurken</i>	<i>uol</i>	boy
7	<i>hördej</i>	<i>bar</i>	go out
	<i>hurken</i>	<i>uol</i>	boy
8	<i>hupkuttej</i>	<i>ahat</i>	feed
	<i>asi</i>	<i>džaxtar</i>	woman
	<i>asatkan</i>	<i>oğo</i>	child
9	<i>hesidej</i>	<i>bis</i>	spread
	<i>asi</i>	<i>džaxtar</i>	woman
	<i>kileb</i>	<i>kiliep</i>	bread
	<i>maslo</i>	<i>aryy</i>	butter
10	<i>uledej</i>	<i>byrax</i>	throw
	<i>hurken</i>	<i>eder uol</i>	youth
	<i>njarikan</i>	<i>uol oğo</i>	boy
	<i>teßynken</i>	<i>meečik</i>	ball
11	<i>ičukendej</i>	<i>kördör</i>	show
	<i>ete</i>	<i>ehee</i>	grandfather
	<i>hurken</i>	<i>uol</i>	boy
	<i>töŋer</i>	<i>küöl</i>	lake
12	<i>haŋandaj</i>	<i>tik</i>	sew
	<i>ata</i>	<i>ebee</i>	grandmother
	<i>asatkan</i>	<i>kyys</i>	girl
	<i>aßun</i>	<i>bergehe</i>	hat

	Even	Sakha	English
13	<i>pekterendej</i>	<i>yt</i>	shoot
	<i>bej</i>	<i>er kihi</i>	man
	<i>morž</i>	<i>muorža</i>	walrus
	<i>bökes</i>	<i>muus</i>	ice
14	<i>hepkendej</i>	<i>tut</i>	catch
	<i>bej</i>	<i>er kihi</i>	man
	<i>olra</i>	<i>balyk</i>	fish
	<i>čeŋeč</i>	<i>küögü</i>	fishing rod
15	<i>heßkendej</i>	<i>olort</i>	plant
	<i>hurker</i>	<i>uolattar</i>	boys
	<i>hjakita</i>	<i>mas</i>	tree
	<i>tölle</i>	<i>tiergen</i>	yard
16	<i>duktaj</i>	<i>suruj</i>	write
	<i>hurken</i>	<i>uol</i>	boy
	<i>dukun</i>	<i>suruk</i>	letter
	<i>karandaš</i>	<i>xarandaas</i>	pencil
17	<i>hamalkaßkandaj</i>	<i>bilihinner</i>	introduce
	<i>bej</i>	<i>er kihi</i>	man
	<i>hunadž</i>	<i>kyys</i>	daughter
18	<i>bödej</i>	<i>bier</i>	give
	<i>asatkan</i>	<i>kyys</i>	girl
	<i>kačikan</i>	<i>yt oğoto</i>	puppy
	<i>hurken</i>	<i>uol</i>	boy
19	<i>hupkuttej</i>	<i>üöret</i>	teach
	<i>asi</i>	<i>džaxtar</i>	woman
	<i>asatkan</i>	<i>kyys</i>	girl
	<i>irittej</i>	<i>buhar</i>	cook
20	<i>bakaldadaj</i>	<i>körüs</i>	meet
	<i>bej</i>	<i>er kihi</i>	man
	<i>gja</i>	<i>doğor</i>	friend
21	<i>ajaßdaj</i>	<i>taptaa</i>	love
	<i>hupkuttil</i>	<i>oskuola oğoloro</i>	schoolchildren
	<i>hupkučimŋe</i>	<i>učuutal</i>	teacher
22	<i>čaktaj</i>	<i>xomuj</i>	gather
	<i>hurken</i>	<i>uol</i>	boy

	Even	Sakha	English
	<i>teŕstel</i>	<i>oton</i>	berries
23	<i>odaj</i>	<i>tut</i>	build
	<i>hurken</i>	<i>uol</i>	boy
	<i>dju</i>	<i>dzie</i>	house
24	<i>dzajuttaj</i>	<i>sas</i>	hide
	<i>hjat</i>	<i>talahtar</i>	bushes
	<i>munrukar</i>	<i>kroliktar</i>	rabbits
25	<i>ŋelukendej</i>	<i>kuttan</i>	frighten
	<i>agdy</i>	<i>etiŋ</i>	thunder
	<i>degil</i>	<i>čyyčaaxtar</i>	birds
26	<i>hōrukendej</i>	<i>ilt</i>	carry
	<i>hunŋe</i>	<i>tyal</i>	wind
	<i>tögečir</i>	<i>sebirdexter</i>	leaves
27	<i>dastaj</i>	<i>bürüj</i>	cover
	<i>imanra</i>	<i>xaar</i>	snow
	<i>mašina</i>	<i>massyyna</i>	car

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