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Toward a new conceptualisation of language revitalisation

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ABSTRACT

This paper outlines a new model of language revitalisation that understands language to be a characteristic of a nexus of social activities rather than an independent object. Language use is one of an overall set of factors contributing to the wellbeing of a particular community. Our model treats language as one node (or a cluster of nodes) in a complex system of interacting behaviours. Changes to another node or in the language node(s) itself can impact overall social wellbeing, something often ignored by linguists (but not by other social scientists working in Indigenous communities). Disruption to an existing network occurs within a time frame; the longer the disruption, the more likely that the network redefines the group. Variables that define the language ecology operate on multiple levels. For the group and for individuals within the group, there can be considerable variation in usage and proficiency over time. Sustainability cannot be reduced to simple cause-and-effect relationships between sociocultural variables. The next phase of language revitalisation projects should be built around the concept of language activity as part of promoting community wellbeing. The use of complex networks that have been applied to human wellbeing in other contexts support our argument.

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Introduction

Over the past 20 years, the growth in the number and types of language revitalisation projects has been remarkable (Pine and Turin 2017; Rouvier 2017; O'Grady 2018). In that same span of time, however, one dominant framework for conceptualising the *raison d'être* for the programmes has remained the same: Endangered languages are a treasured cultural resource that needs to be protected. As such, these languages are a resource for communities that have historically used them, not only in terms of encoding cultural knowledge in a unique way, but also in terms of reinforcing a common social identity. They are, in addition, invaluable for humanity more generally in that they possess distinctive linguistic features of scientific interest and they provide insights into the varied ways in which humans interact with their world. In recent years, the import of endangered languages has been further expanded to include their potential link to the environmental health of the planet. In other words, protecting endangered languages from becoming extinct is in everyone's self-interest in one way or another.

While this rhetorical tack has been largely successful in catching the attention of the public, and in gaining sympathy for the plight of languages that may cease to be spoken in the not too distant future, ironically the concept of 'endangered languages' is not particularly effective as the foundational notion in developing language revitalisation projects, as many scholars and activists have

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argued (see, e.g. Hill [2002]; Stanford and Whaley [2010]; Perley [2012]; Dorian [2014]). While 'endangered languages' succinctly evokes a call to action in order to preserve the ecosystem of a vulnerable entity, the expression also obscures the reality that language maintenance and revitalisation is more about the empowerment of language users, or potential language users, than the language per se.

What concept of language might better serve the purposes of revitalisation? In this paper, we propose that it is more useful to envision language as a means to cultivate community wellbeing. This proposition draws on the common observation that language shift often is experienced by individuals as a loss of part of themselves and as an impoverishment to their communities. Language revitalisation, therefore, is a mechanism by which to improve community health. In order to present the case for conceptualising language in this way, it is also necessary to sketch out a model for how language use is dynamically embedded in community life. Such a model, we believe, will provide a much more effective way to formulate and evaluate language revitalisation programmes.

Language and community wellbeing

Motivations for language revitalisation are increasingly being cast within a broader context of community wellbeing. For example, the Endangered Language Project describes it this way: 'Our psychological, social, and physical well-being is connected with our native language; it shapes our values, self-image, identity, relationships, and ultimately success in life' (see the link to 'Why are endangered languages important' at http://www.endangeredlanguages.com/faq/). Similarly, King, Smith, and Gracey (2009, 78) assert that 'Language revitalisation can be seen, therefore, as a health promotion strategy.' Whalen, Moss, and Baldwin (2016) conclude, 'Language programmes in [Native American] communities hold the promise of improving the mental and physical health of those who participate in them.' Many further examples could be provided, but the crucial point is that there is an apparent shift away from describing revitalisation as a critical activity because it preserves a language, and towards seeing revitalisation as important because it promotes the wellbeing of specific communities, and by implication, individuals within those communities. Of course, the underlying assumption behind this shift in terminology isn't entirely new. Speakers often find language to be constitutive of their communal and individual identities and to forge a connection to their past. The value of language, then, is not exclusively its communicative power, but also the sense of belonging it creates.

Even so, the shift in how revitalisation is described is striking, as it moves away from a Language as Species simile to a conception that Language is a Source of Health. Of course, it remains to be seen whether this conceptual shift will be any more effective in stimulating existing revitalisation efforts to continue or prompting new ones than 'endangered languages' has been. On the plus side, the Language as a Source of Health simile once again taps into a currently popular rhetorical strategy – describing a social issue, whether it be gun control, bullying, soda consumption, gender relations and so on, as a matter of public health and individual wellbeing. It makes the importance of fostering certain language behaviours easily translatable into something important and urgent, something in need of public support and well-crafted policy. In our experience, it also resonates well within communities where there is a desire for language revitalisation.

There is a potential downside, however, in the long run. The **specific** benefits to individual health and community wellbeing are often left unclear in advocacy for revitalisation. Are we talking about physical health, and if so, which aspects of it? Or are we talking about psychological health, social health, spiritual health, or all of the above, or some subset thereof? And for each of these types of wellbeing, what actual outcomes are we to expect if one set of language choices is selected over another?

Efforts to clarify some of the connections between language and physical/psychological wellbeing have begun, but admittedly, so far, with mixed results. For example, Hallett, Chandler, and

Lalonde (2007) found a correlation between Indigenous language use and significantly lower rates of youth suicide in British Columbia. Oster et al. (2014) found a correlation between lower rates of diabetes and Indigenous language knowledge in Alberta after adjusting for socioeconomic factors. In a study in Labrador, Liebenberg, Ikeda, and Wood (2015) demonstrate that those speaking Inuttiut at home had higher scores on various resiliency measures. A study by Rowley et al. (2008) in the Northern Territory of Australia demonstrates that social factors, including connectedness to the land, culture, family, and opportunities for self-determination, together with diet, physical activity, and low use of alcohol combined correlate with lower cardiovascular disease, morbidity and mortality. This study does not address language specifically, but rather, culture more broadly defined. Such research, even though it does not establish the particular connection between Indigenous language use and health, suggests that some connection exists.

On the other hand, other research has not found a connection. For example, Biddle and Swee (2012) found a negative correlation between speaking and understanding an Aboriginal language and happiness in Australia. Also from Australia, Weston's (1996) research concludes that speakers with a good command of a dominant regional language, as opposed to a more localised Indigenous language, score higher on a number of measures of wellbeing. Within all this research, there are varying notions of what Indigenous language knowledge and use mean, and there is variation in notions of resiliency and happiness. To our knowledge, no research has begun to ask whether Indigenous language use might intersect with health in different ways in different regions of the globe. Clearly, there is considerable need for further research to sort all this out.

That said, our review of the existing research, together with how revitalisation programmes often promote a strong connection between language use and wellbeing, allows us to make the following tentative observations.

- The connection between language and wellbeing is indirect. This is to say, speaking a particular language or set of languages does not cause increased wellbeing, whether that be physical or some other sort.
- How language contributes to wellbeing is considerably more complicated than what is normally described. If, for example, there is a correlation between minority language use and lack of economic opportunities for sociohistorical reasons, then minority language use might very well also correlate with dietary deficiencies, which in turn would mean that it also correlates with lower measures of physical health. Alternatively, if minority language use correlates with participation in local subsistence activities, then it would also likely correlate to higher measures of physical health. As a concrete example, berry-picking and hunting are activities for which many Arctic peoples, including Alaskan Inuit, report common use of the Indigenous language, and it has been shown (e.g. Redwood et al. [2008]) that there is a correlation between traditional subsistence activities and better health outcomes.
- Specific choices of language use are going to correlate with wellbeing in a dynamic way. By this we mean that wellbeing is influenced by a host of factors which are themselves not static. Political situations change. Environmental situations change. There are pandemics, instances of social violence and transformation, and shifts in technology that alter social relationships. Individual and collective wellbeing are in an adaptive relationship to all such changes, so wellbeing itself is inherently dynamic and always being renegotiated, both as an ideal and as how it manifests itself in individual and collective behaviour.

Therefore, the Language as a Source of Health simile itself is ultimately inadequate as a concept for language revitalisation because it suggests a far too simplistic connection between language behaviour and wellbeing. However, there is also much to be said for it. It accurately captures the reality that the kinds of things that do contribute to wellbeing commonly involve a linguistic dimension. Wellbeing, minimally, requires that basic physical needs are met, that there are positive social relationships, that there is a physical ability to get things done on a daily basis, that there is an ability

to make provisions for others and that there is a sense of belonging to a group. In many cases, it also likely includes some notion of transcendence and meaning, some sense of self-determination, and a connection to a particular geographical location. Every one of these factors involves language to a degree. Language is involved in wellbeing, but in an extremely complicated way.

Therefore, there is need of a conception of language that helps assess the vitality of a language, but also captures the multifaceted, dynamic, and complex ways in which the ability to use a language (or set of languages) contributes to individual and social wellbeing.

Models of language vitality

There are a number of different models used for analysing language vitality that are intended as tools for implementing language revitalisation. In this section, we present an overview of one particularly well-known and helpful approach. We then offer a brief critique.

Fishman and the (expanded) Graded Intergenerational Disruption Scale

Fishman's (1991) Graded Intergenerational Disruption Scale, or GIDS, was designed specifically with the intent of 'reversing' language shift. Fishman built his scale on an analogy with the Richter Scale: the higher the number, the more serious the disruption to (or shift away from) a language; lower numbers indicate less (or no) disruption and stronger language vitality. The GIDS scale ranges from a low of 1 (the language is used in education, work, mass media, and the government) to a high of 8 (the only speakers are members of the grandparent generation). The scale assesses disruption (or vitality) in terms of domains of use, official support (national, regional, local) for the language, and the generation(s) of speakers that speak it.

Fishman's original scale was subsequently developed further into the Expanded Graded Disruption Scale, or EGIDS (Lewis and Simons 2010). EGIDS is exactly what the name implies: an expansion of Fishman's framework to include more levels, so as to capture a more nuanced scale of language vitality. EGIDS has 13 levels, beginning at 0 (international) and ending at 10 (extinct). It departs from GIDS in differentiating speakers of the grandparent generation (Level 8), into two levels: in 8a, the only remaining active speakers are members of the grandparent generation, while in 8b, they are not only the sole generation fluent in the language, but they themselves also have little opportunity to use it. EGIDS also expands Fishman's original Level 6, which is ascribed to a language 'used orally by all generations and is being learned by children as their first language.' EGIDS uses 6a for multigenerational use which is sustainable (the label for the category is 'Vigorous') and 6b ('Threatened') for situations in which a language is being used by all generations, but some speakers are beginning to utilise another language for some or all situations.

Both GIDS and EGIDS are useful in diagnosing the relative vitality of a language compared to other languages. They also capture the reality that if a language is at level 6b or below, its long-term vitality will decline unless something happens to change the patterns of language use. The GIDS/EGIDS scales, however, do not address what factors lead to a loss of language vitality. Therefore, supplementary tools have been developed. For example, *Ethnologue* is one that is often referenced. Simons and Fennig (2018) write:

> *Ethnologue* reports data that are indicators of the two major dimensions of language use (users and functions). When data are available, we report the following factors which may contribute to the assessment of language endangerment:

- The speaker population
- The ethnic population; the number of those who connect their ethnic identity with the language (whether or not they speak the language)
- The stability of and trends in that population size
- Residency and migration patterns of speakers

- The use of second languages
- The use of the language by others as a second language
- Language attitudes within the community
- The age range of the speakers
- The domains of use of the language
- Official recognition of languages within the nation or region
- Means of transmission (whether children are learning the language at home or being taught the language in schools)
- Nonlinguistic factors such as economic opportunity or the lack thereof

Drawing on Edwards (1992), Grenoble and Whaley (1998, 2006) offer a much more elaborate treatment of the factors involved in language vitality, establishing a set of interrelated variables at the macro (i.e. regional, national and transnational) and micro (i.e. a particular community) levels; this model itself builds on the fundamental work of Fishman (1966); Giles, Bourhis, and Taylor (1977); and Kloss (1966), which lay the foundation. One insight of that model is that local variables must always be interpreted in the context of macrovariables. For example, a speaker population of 1,000 in an undeveloped portion of the Amazon river basin reflects a very different reality from a speaker population of 1,000 in the United States. A second insight is that, at least for language revitalisation, more effort must be spent fleshing out 'domains of language use' to determine those that are more or less likely to cause wholesale language shift from one language to another.

A shortcoming of these scales for language revitalisation

The GIDS/EGIDS scale, like the less detailed scales of Krauss (1992) and UNESCO (2003), have been valuable in providing terminology that can express relative degrees of language vitality. They have also been put to good use in estimating the likely decline in linguistic diversity on the planet or particular regions. These estimates, though quite divergent (see Whaley [2003] for a discussion), have served as a clarion call for politicians and language activists to do something to preserve the world's linguistic heritage. For example, there is Krauss's (1992, 7) oft-cited warning: 'Therefore, I consider it a plausible calculation that – at the rate things are going – the coming century will see either the death or the doom of 90% of mankind's languages.'

However, the scales in and of themselves provide minimal guidance about what sorts of interventions might be most effective to keep a language from shifting, say, from 'Vigorous' to 'Threatened' status. That requires a much more fine-grained analysis that is sensitive to the peculiar sociopolitical situation impacting the use of a language. There is a related, but more subtle, issue that makes these scales difficult to apply in language revitalisation. Namely, for the most part, they imply that speech communities are homogenous and that individuals are static and consistent in language use, rather than speakers whose linguistic repertoire is fluid and changing (see Boix-Fuster and Vila [1998] and Comajoan [2005] for similar arguments). Language shift is known to be characterised by a decrease in domains of usage and in speakers, in particular a decrease of speakers over the generations with lack of transmission to children. This view identifies critical stages in language shift but does not capture the multiple stress points that lead to a decrease in domains. It also does not capture variation in language practices at the individual level or at a societal level. To capture these realities, a model of language vitality that is both complex and dynamic is needed.

A new conception based on networks

The model introduced in this section provides a more dynamic and nuanced understanding of language ecology than is typically presented elsewhere. *Language practices* are fluid: an individual's language practices can change throughout the course of a day and often do change over a lifetime.

Language practices are dependent on social domains, the activities involved in those domains, and the language proficiencies of the participants, in addition to pressures in choices about language determined by external authorities and policies. (This is something captured in the models presented above: national-level language and education policies can and do determine what language is used in certain settings regardless of local interests.) Moreover, an individual's *verbal repertoire*, the different languages and varieties of those languages that an individual controls, changes over that person's lifetime, and can change in much shorter spans, reflecting alterations in social practices, and proficiency as new languages, varieties and registers are acquired, used, or grow rusty through lack of use. For people living in plurilingual communities there is even more dynamicity, as language use can switch during a single activity, as evidenced in multilingual practices such as code-mixing and translanguaging practices (Cenoz 2013; García and Li 2014).

The model being proposed here, the *Language Vitality Network Model* (LVNM), is meant to better reflect the dynamic nature of language practices.[1] LVNM embeds language practices in a larger nexus of social practices. In the model, a social practice is depicted as a cluster of nodes. Each node within the cluster depicts one aspect of that social practice that potentially involves language. For example, purchasing consumable goods from a local store might involve walking to the store (and perhaps listening to vocal music), interacting with the clerk, making a choice about the items to be purchased (possibly reading labels, asking a clerk for information, or having an internal conversation about the options), paying for them, and returning home. Of course, particular instances of this social practice may not involve each of these nodes. A shopper may decide not to purchase anything after all, and there will be no exchange of money. The social practice may vary from instance to instance. Perhaps the shopper drives to the store instead of walking. And there may be additional nodes involved, for instance, reading a shopping list or talking on a cell phone. In LVNM all the nodes that commonly attend a social practice are present, though for a particular instance of that social practice only some of the nodes are activated.

Activated nodes involve some sort of language use. Individual speakers are actors in this model; as they move through the day, different parts of the linguistic repertoire are activated in accordance with the activities and domains in which they participate, and with their interlocutors. The model is dynamic, reflecting different language practices that (may) change as a speaker changes activities. Speakers aggregate in a domain. In the digital visualisation of LVNM, we use a time-varying Markov network model.[2] Different languages are colour-coded, which enables representation of an individual's usage of different languages, as well as the use of different languages, or codes, in a single domain. LVNM is designed to capture both multilingualism and the dynamicity of language practices. The model assumes that at least one speaker is present for linguistic activity to take place, to be activated.

For the purposes of the present article, we have translated the coding of languages into different shapes. Speakers are visually represented as individual dots; information about their linguistic repertoire is captured in different shapes, which can be organised hierarchically according to proficiency or speaker preference (by which we mean that some speakers may identify a preference for one language over another, considering it primary).

For example, we can represent English as a square and Danish as a triangle. For the sake of simplicity, we represent two Inuit languages (Iñupiaq and Kalaallisut) with a circle, as there are no speakers in our corpus who speak both languages. Thus, monolingual speakers are symbolised by use of a single shape as given in Table 1:

An individual's linguistic repertoire can be visually represented using these shapes so that the primary language is the outermost image Table 2:

Furthermore, we recognise that which language is primary or dominant is a fluid construct and for some speakers varies with usage, depending on domain or interlocutors; for example, as recognised by Grosjean's (1997, 2010) Complementarity Principle, which recognises variation in the use of language by bilinguals. Put simply, bilinguals both acquire and use languages for different purposes in different domains. This is the case for many Iñupiaq speakers interviewed, for whom

Table 1. Symbols indicating languages.

English	
Danish	
Iñupiaq/ Kalaallisut	

English is primary in many domains, but Iñupiaq becomes primary in praying for the hunt, collecting berries, or talking to small children.

To make clear what we have in mind, consider Figure 1, which maps out monolingual English speakers shopping in the US:

Mapping language usage of monolingual speakers is not particularly interesting unless we drill down to more fine-grained distinctions in code and register, for example, as speakers flip through familylects, casual speech, higher registers, and so on. Figure 1 is intended here to provide a sketch of the basic concept. Each network provides a snapshot of a speaker's linguistic practices at a moment in time. The networks can be compiled to compare both inter- and intraspeaker variation. The LVNM model breaks down what is generally considered to be a domain into smaller levels of activity and identifies individual actors, as well as their participatory roles, in each activity. The networks depict individual behaviour but can be aggregated across a community to define 'typical' behaviour, not the 'only' behaviour. LVNM can be used to problematise the notion of 'community,' a term which is used frequently in language revitalisation but oversimplifies the actions of quite independent individuals who may be better characterised by heterogeneity than homogeneity. *Community* is best understood as shorthand for something more complicated; community is a social construct; a community of practice is perhaps more apt in its conceptualisation as it conveys

Table 2. Representation of multilingualism.

An individual's linguistic repertoire can be visually represented using these shapes so that the primary language is the outermost image:

English				L2 = E, L3 = D
Danish				L2 = D, L3 = E
Iñupiaq/ Kalaallisut				

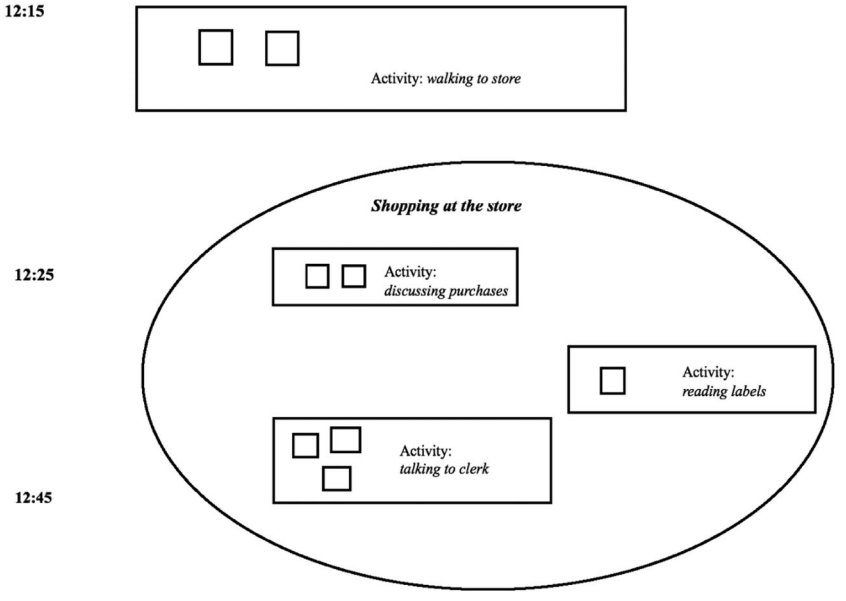

Figure 1. A shopping trip.

the fluidity of both membership and activities that community members engage in (see Meyerhoff and Strycharz [2013] for discussion). Instead, the model allows for the representation of subcommunities, overlapping and/or changing identities.

Our model is informed by previous work on social network theory, expanding it beyond social interaction to encompass a richer and more varied set of variables, with one goal being to model the effects of change in one part of the system on another (in this case language use and vitality). Some parallels may also be drawn with connectionist cognitive models, which have been useful in understanding Second Language Acquisition because connectionism can capture the dynamic and emergent nature of learning and performance (Shirai [2018] provides a recent and comprehensive overview). An example of how the LVNM schema operates will help to clarify what we intend, with a contrastive set of language practices as exhibited by speakers of two closely related Inuit languages, Iñupiaq and Kalaallisut, in differing language ecologies.

Illustration: Inuit languages in Alaska and Greenland

The differing language ecologies of two closely related languages, Iñupiaq and Kalaallisut, serve as a case study to illustrate our model. Iñupiaq (ISO 639–3 ipk) and Kalaallisut (ISO 639–3 kal) are both members of the Inuit branch of the Inuit-Yupik-Unangan language family. We do not have reliable up-to-date speaker counts for either language, but there is a clear difference in terms of the percentage of the population that speaks the language, and in terms of vitality. Iñupiaq is spoken by an estimated 2,144 speakers in Alaska, from an ethnic population of 15,700 (Krauss 2007), or about 14%. Following EGIDS, the Alaska Native Language Center considers Iñupiaq to be 'threatened' (http://www.uaf.edu/anlc/languages/stats/). It is one of twenty legally recognised official Native languages in Alaska, in addition to English. The Alaska Native Language Preservation and Advisory Council relies on UNESCO figures (ANALPAC 2018).

Kalaallisut is spoken by roughly 50,000 people in Greenland (Krauss 2007; Simons and Fennig 2018). The total population of Greenland is 55,860 (as of January 2017); the Greenland census data do not identify people by ethnicity, but 89.7% of the total population was born in Greenland, although that number certainly includes some people who speak Danish and not Kalaallisut, or

limited Kalaallisut. Among people born outside of Greenland, there are native, first-language speakers of Kalaallisut, as well as speakers of other languages (Greenland in Figures 2017). Speakers of all ages use Kalaallisut as a first language; it is the language of education and government in Greenland.

We illustrate the implementation of the Vitality Network Model by comparing language use in two communities of comparable size: in Barrow, Alaska and in Sisimiut, Greenland. Consider first the situation in Barrow. Although speech behaviour is changing due to revitalisation efforts, Iñupiaq is used in limited domains, and English usage is more widespread and prevalent in public domains. Traditional activities provide domains for Iñupiaq language use across the community, although there is variation here: some speakers use Iñupiaq in other domains, and some use limited to no Iñupiaq even in traditional domains.

Consider the practice of whale hunting, which can be broken down into a series of activities (an abbreviated list of activities is used for present purposes). The preparatory activities are chronologically organised, and language usage varies with each activity, in accordance with both the activity and speakers' proficiencies:

Chronology: scout ice > set up ice camp > manoeuvre boats > pray for whale.

Furthermore, some activities could be broken up into a smaller set of connected nodes. For example, setting up an ice camp involves a number of different discrete activities, some of which could have distinctive social meaning. The cluster of nodes that are linked together in Figure 2 identify the activity of whale hunting, or more specifically, spring whale hunting. This cluster of nodes would clearly be closely related to another cluster of nodes that identify fall whale hunting, but also to seal hunting, and more abstractly to a broader set of node clusters that identify hunting in general. Hunting activities are themselves organised into hunting land versus sea mammals. Hunting for sea mammals could also be grouped with fishing activities; both are conducted in the sea and involve boats.

In Figure 2, we map language use in four activities: scouting for ice is done in both English and Iñupiaq, setting up camp and manoeuvring boats in English, and the prayer for the whale is conducted in Iñupiaq. We indicate changes in language use by changing shapes in Figure 2; note that in the typical prayer setting, only one person performs the prayer, but all participants hear it in Iñupiaq.

Certain social actions involve Iñupiaq, others English, and others a combination. These labels are shorthand for what could be represented in a more specific way. For example, Iñupiaq vocabulary about ice provides a remarkably efficient way to describe a terrain that can be treacherous to traverse in order to get to the places where whales can be hunted (see, e.g. Aporto [2010]; Kapsch, Eicken, and Robards [2010]). However, if a hunting group contained English speakers with an

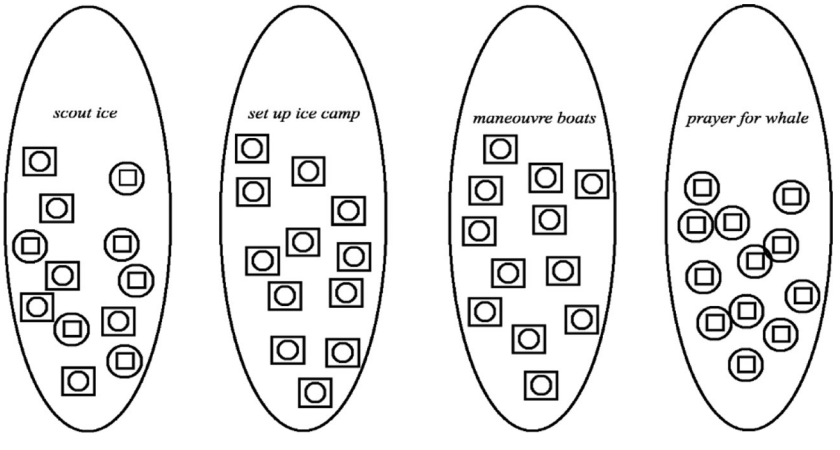

Figure 2. Preparing for a whale hunt.

incomplete knowledge of Iñupiaq ice vocabulary, then much more English would be used in scouting the ice as a matter of necessity.

The value of such an approach becomes clearer if we contrast it to a different language setting, the use of Kalaallisut in Greenland. In Greenland, arguably all domains are Kalaallisut-dominant (by law), with some exceptions in government, higher education, and some schools (where Danish-speaking children attend); and much of the instruction at the University of Greenland is in Danish. As a concrete example that is roughly comparable to Barrow, Alaska in size, we take the town of Sisimiut for our example.

To understand how LVNM captures the dynamic complexities of multilingualism, we can examine the interactions of one person, Aviaja, with other members of her community. This particular illustration is taken from field observations in Greenland, and is a concrete example of a more general and repeating pattern across speakers. Aviaja's first and primary language is Kalaallisut, and she is highly competent in Danish: she holds an MA degree and has received all higher education in Danish. She is also fully functional in a third language, English, and has studied in the US. She lives with her sister Dorthe and her parents in Sisimiut. Both sisters prefer to speak Kalaallisut, but over the course of a normal day, they use all three languages. In Table 3, activities are arranged by domain, listed sequentially and numbered; contemporaneous activities are designated a, b, and so on:

These activities are visually represented in Figure 3; as different languages are activated in Aviaja's and Dorthe's repertoire, the dominant shape changes:

Although the primary language in the home is Kalaallisut, there are entry points for Danish, as seen in the practices of a single evening, in watching television and using Facebook. The diagram is overly simplified: as Dorthe recounts events at the shop, she quotes speakers in Danish or English, depending on the language of the original speech. This is a well-known strategy in reporting direct speech (Muysken 2000), and typical of multilingual practices.

The dynamic language practices of a multilingual family are apparent when tracking changes from day to day. Language use varies not just with domain, but with interlocutors. Consider what happens when someone who does not speak Kalaallisut is involved. Kristina is a teacher visiting the school where both parents work. She speaks no Kalaallisut, so everyone accommodates her when she comes to dinner and they speak only Danish at the table:

Figure 4 correctly captures what many people in Greenland report anecdotally, and what has been confirmed by our own observations: as soon as a Danish speaker enters a domain or space, Inuit accommodate and switch to speaking Danish. As seen in Figures 3 and 4, there are several pressure points for Danish to enter, even in a Kalaallisut-speaking home: with Danish speakers and in the media. When American researchers come to dinner, English also enters, and the conversation switches between Kalaallisut, Danish and English.

Although all speakers are fluent in Kalaallisut, their knowledge of not only specialised hunting vocabulary but also of the linguistic encoding of associated concepts of the natural world – land, sea

Table 3. Language usage in Sisimiut, two sisters and their daily experience.

Activity	Domain	Aviaja	Dorthe
1	eating breakfast	Kalaallisut	Kalaallisut
2	travel to town	Kalaallisut	Kalaallisut
3a	visit grandmother	Kalaallisut	–
3b	work in shop	–	Kalaallisut
4	Danish cruise ship arrives	Kalaallisut (still with grandmother)	Danish with tourists; Kalaallisut with coworkers & local shoppers
5	International cruise ship arrives	English (gives directions on street)	Danish, English with tourists; Kal with coworkers
6	cooking dinner	Kalaallisut	Kalaallisut
7	dinner conversation	Kalaallisut	Kalaallisut
8a	TV: listening/watching	Danish	Danish
8b	TV: speaking to one another	Kalaallisut	Kalaallisut
9	Facebook	Kalaallisut, Danish, English	Kalaallisut, Danish

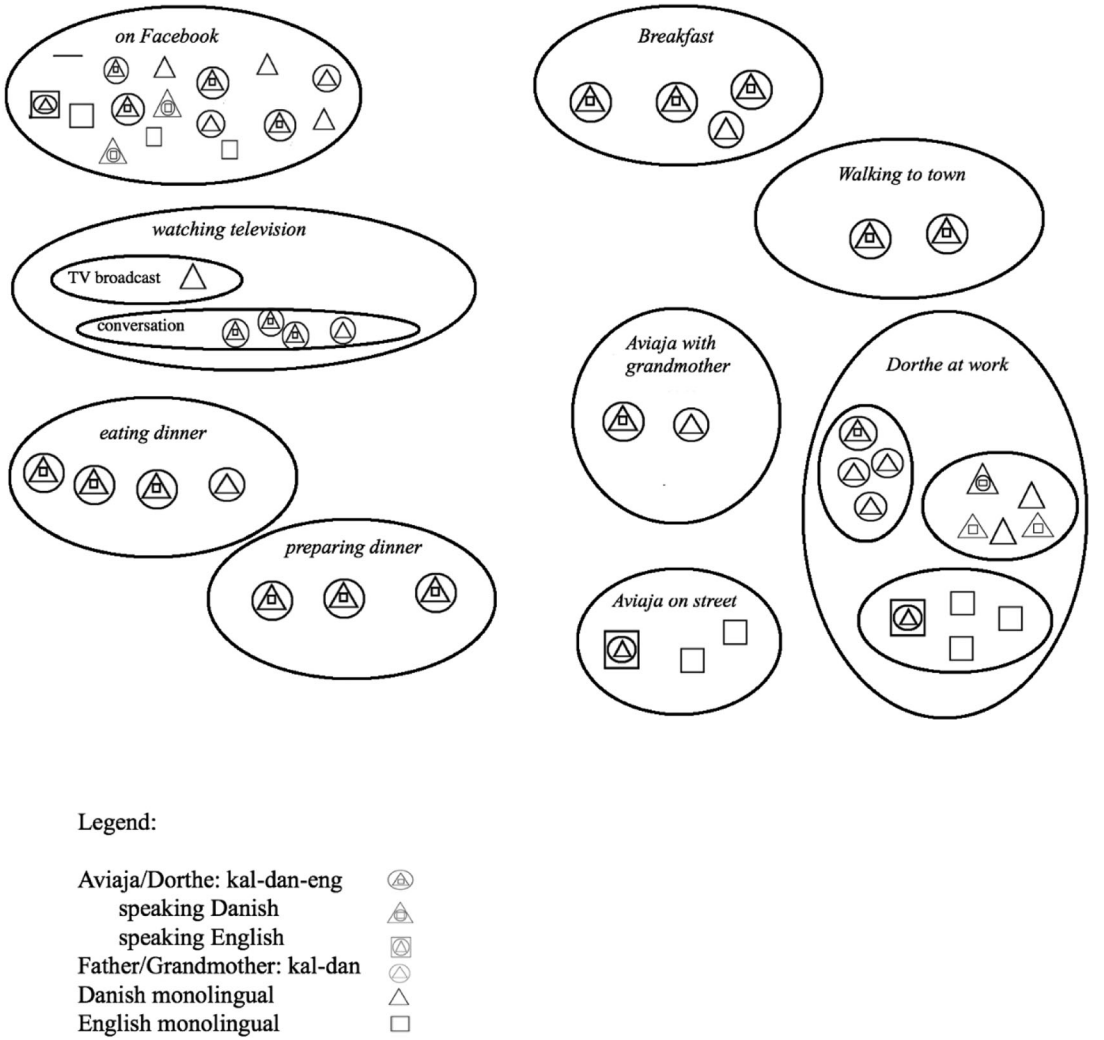

Figure 3. Language Repertoires in Sisimiut.

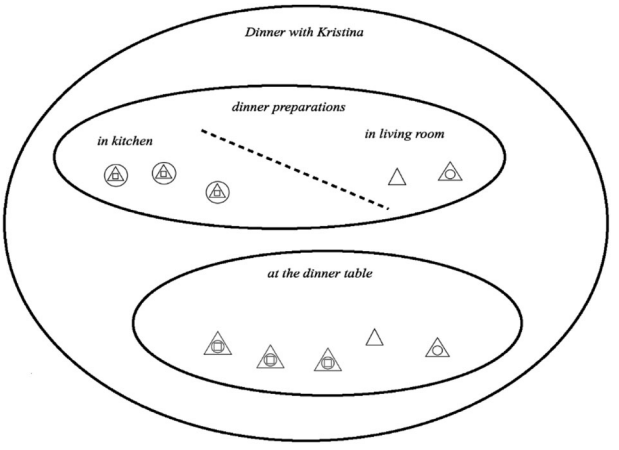

Figure 4. Kristina comes to dinner.

and space –vary. There is thus variation in each individual's verbal repertoire: some individuals are more proficient hunters and have more proficient uses of the specialised code; some have only partial knowledge, and others have limited to no knowledge. This does not correlate with age so much as intensity of engagement. For example, in members of a single family in Sisimiut, the grandmother (widely held in the community to be an authority of Inuit heritage) had extensive knowledge of place names and local histories, but directed us to her son, a professional hunter, for information about the wind-based directional system. Two women of approximately the same age (30-33), born in Sisimiut, living in Nuuk for a few years, both educated at the University of Greenland, both primary speakers of Kalaallisut, were found to have differing levels of knowledge about spatial language (landscape, wind terminology, and the coastal-based orientation system) and hunting terminology. One, the niece of the professional hunter but only an occasional hunter herself, had more limited knowledge than the other, who hunts more. Neither has the full verbal repertoire of the professional hunter for this particular domain, although again, all are fully fluent, first-language speakers for whom Danish is a second language.

Such variations in verbal repertoires are reflected in the model when networks are created for separate individuals. When networks are combined to provide a snapshot of larger groups, the more common verbal repertoires will emerge as reflective of the speech behaviours of that community of practice.

The vitality network model and language revitalisation

But how does all this relate to language revitalisation? Here we highlight three important implications for thinking about revitalisation programmes; more detail is provided in Grenoble and Whaley (forthcoming).

First, it encourages conceptualising language as a feature of social interaction that can be embedded partly or wholly into different social domains. Therefore, language revitalisation is not solely, or even in the first place, a matter of teaching competence in a linguistic code, but a matter of introducing (or reinforcing) language use, improving language attitudes, and bolstering self-confidence, as already recognised in much current research on language revitalisation. For example, many revitalisation efforts have focused extensive resources on the development of school-based programmes, only to find that individuals do not often employ the linguistic knowledge that they have gained outside of the school setting (see, for example Hermes and King [2013], who explore some ways being introduced to overcome this issue with Ojibwe). An alternative suggested

by our schema would be to reintroduce (or expand upon) language use into some or all of the links of existing socially meaningful activity, such as food-gathering, formal ceremonies, acts of religious devotion, manufacture of local products, or sporting activities. This could be done as an alternative to or in connection with a programme in formal education, but in the latter case, would still inform the curriculum being taught.

A second related advantage of the schema is that it prompts the assessment of language vitality not solely in terms of the overall linguistic aptitude of speakers, but also to have an inventory of where the language activity is being used and by whom. After all, speakers who are not fully fluent often have a great deal of linguistic skill in some social activities while having far less confidence in speaking in others.

A third advantage of the model is that it provides a more nuanced way of thinking about multilingualism than the concept of language endangerment. Whereas the Language as Species simile depicts languages as being in competition for an ecological niche, the language as a feature of links in a network concept depicts languages as helping to enact social behaviours. This leaves room for recognising the plethora of ways in which multilingualism can function in a particular location or in an individual. Is there a stable bilingualism, and if so, is that due to assigning different languages to different social domains or social activities? Or do both languages occupy the same space and, hence, is there significant code-switching based on the specific interlocutors? Is there asymmetrical bilingualism? If so, in which activities? And so on. In most, if not all, instances of language revitalisation, the goal is not to eliminate the currently dominant language in favour of the revitalising language. Rather it is to (re-) introduce a sustainable bilingualism. But what is the vision for how this bilingualism would operate? The model provokes this question.

In summary, we have argued that the current dominant rhetoric surrounding language revitalisation – that of endangered languages – has been useful for raising awareness of the reality of shrinking global linguistic diversity, but that it is not well-suited for the ambitions of language revitalisation. It may, in fact, subvert those ambitions in subtle ways. We then observed that in reaction to these shortcomings the rhetoric has begun to shift towards thinking of language revitalisation in terms of wellbeing. While that shift is welcome in many ways, we have argued that the underlying conception behind it is also not well suited for language revitalisation, both because it suggests too direct a connection between the use of a particular language and community wellbeing, and because most of the conceptual apparatus around wellbeing is too vague and underdeveloped. Wellbeing needs to be understood as a concept that goes beyond physical and mental health, although such benefits are in and of themselves of great importance. More broadly, we see wellbeing as integral to strong societies, encompassing the notion of successful community resilience in the face of social change, including a greater degree of self-determination, external visibility and respect (see Grenoble and Whaley [forthcoming]). Finally, we proposed an outline of a concept of language that is helpful in framing language revitalisation going forward.

Notes

1. Similarly, the use of complexity theory in the study of language development and acquisition attempts to capture the dynamic and complex nature of language; see Larsen-Freeman (2012) for an overview and arguments.
2. Markov chains are used to model the probability of processes by observing transitions and are useful for visualizing how systems change. The distribution of each variable depends on the adjacent variables with which it is connected. We use this in the expanded form of the LVNM as a tool to model the dynamic nature of the factors that enter into language choice and usage.

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