Bridging Diaspora: Technology in the Service of the Revitalization of Sà'án Sàvĭ ñà Yukúnanĭ (Mixtec)

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Abstract

Indigenous communities around the world face challenges in maintaining their languages, and this is especially the case for communities in diaspora. This article presents a model of digital language revitalization aimed at bridging diaspora communities with communities of origin by leveraging, connecting, and claiming spaces in digital platforms. We present three components of such a project for Sà'án Sàvĭ ñà Yukúnanĭ (Otomanguean, Mexico): an open-source video game for children, a website for connecting activities and sharing materials, and the development of a social media presence that connects wider audiences to the work while opening up new spaces for interaction and community building. We argue that a multi-pronged approach combines the advantages of different platforms while reducing their drawbacks. The focus is on reducing technical obstacles in order to better position community language workers for creating, leading, and managing the research and outreach that helps them advance their language-related goals.

Introduction[1]

New digital media allows people to participate regularly in communities of cultural and linguistic practice regardless of geographical location. For diaspora communities, virtual spaces offer much needed opportunities to use traditional and minoritized languages in everyday life and provide a platform for maintaining relations with origin communities. This so-called "Performance Era" in minority media (Kelly-Holmes & Atkinson, 2017) is characterized by non-professional individuals taking up the role of platform creation and management. As the Internet has become an essential platform in community building (Belmar & Glass, 2019), language revitalization projects around the world have begun creating digital presence (Belmar, 2020a; Soria, 2016) while making use of digital tools to satisfy their own needs (Tcherneshoff & Udell, 2019).

In this paper we discuss how three components of a language revitalization project for Sà'án Sàvĭ ñà Yukúnanĭ, an indigenous language originating in Oaxaca, Mexico, illustrate the role of cyberspace and virtual communities as loci for community language engagement in diaspora situations (see Belmar & Glass, 2019; Coronel-Molina, 2019). The first component exemplifies the possibilities of gamification for language learning through the creation of a video game whose design and implementation have been completely under community control (§3). The second component involves the creation of a website designed to be a self-managed data-sharing platform for community members residing both in California and Oaxaca (§4). Finally, the third component aims at diffusion of materials as well as community building through social media engagement (§5). We suggest that (i) developing a variety of resources on a spectrum of platforms enables the benefits of each to be enjoyed, (ii) linking them together

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mitigates the drawbacks of each, and (iii) this approach helps grow a community of users, especially when the activities and tools are community-centered.

Linguistic and Community Contexts

Mixtec is a language complex (Kaufman, 2006) consisting of many distinct languages and varieties that are indigenous to at least 189 municipalities in the Mixteca region, which spans parts of the Mexican states of Oaxaca, Guerrero, and Puebla (Smith Stark, 1995). Along with Cuicatec and Triqui, Mixtec belongs to the Mixtecan language group (Longacre, 1957), a major branch of the large and diverse Otomanguean language family (Campbell, 2017; Rensch, 1976) Sà'án Sàvĭ ñà Yukúnanĭ belongs to the Mixtepec subgroup (ISO 693-3: mix) of Mixtec (Josserand, 1983); it is traditionally and currently spoken in the village of Yucunani, municipality of San Juan Mixtepec, Oaxaca. Mixtec is an exonym of Nahuatl origin meaning 'people (and language) of the clouds.' Endonyms for the language include Sà'án Sàvĭ 'Language of the Rain' and Sà'án Ntá'vì 'Poor/Humble Language.'

500 years of colonialism and more recent neo-liberal policies have undermined traditional economies and devastated the environment in many parts of the Mixteca (Edinger, 1985)—as elsewhere in Mesoamerica—leading to large-scale emigration of Indigenous peoples (López, 2016), especially to northern Mexico and the United States, where the majority work in California's enormous agricultural industry (see Kresge, 2007; Mines et al., 2010). Thus, Sà'án Sàvĭ ñà Yukúnanĭ is now also spoken in Central Coastal California. The 2010 Mexican national census counts 87 native speakers in Yucunani (INEGI, 2010). The number of speakers is greater when adding those in diaspora, but intergenerational transmission is weaker in diaspora than in Oaxaca. As emigration from Yucunani continues, maintaining the transmission of the language in California is a crucial step in maintaining the language's vitality.

In Yucunani, Sà'án Sàvĭ is used in a wide variety of contexts, from household interactions to community announcements via loudspeaker. In the schools, Spanish is used for reading and writing, but the oral language depends on the teacher: Mixtec if they speak the same or similar variety as the students, otherwise Spanish. People communicate with those from neighboring communities in Mixtec, occasionally shifting to Spanish when the varieties are too distant to be mutually intelligible. Use of Spanish and English is widespread in the US diaspora, where second and third generations sometimes exhibit receptive knowledge of Sà'án Sàvĭ but avoid responding to elders in the language (see Reyes Basurto et al., 2021).

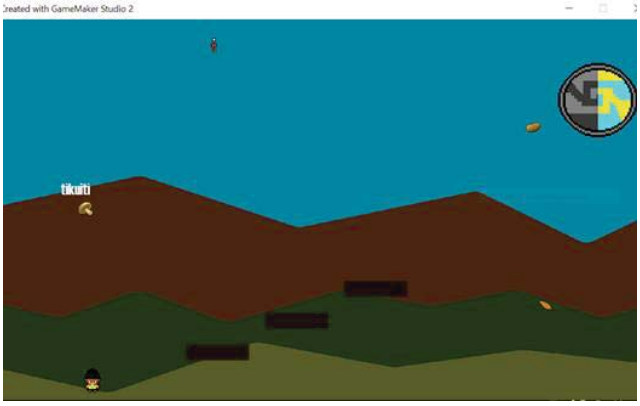
The work presented here reflects ongoing collaborative documentation of Sà'án Sàvĭ by Jeremías Salazar and linguists at the University of California, Santa Barbara, which began in the Fall of 2019 in the UCSB Field Methods class.

The Sà'án Sàvĭ Catch Game[2]

Motivated by the role of food in maintaining identity among young speakers (Weller & Turkon, 2015), Jeremías and Giorgia have developed an independent video game that helps children learn and review food terms in Sà'án Sàvĭ. The game was prototyped in Scratch (Maloney et al., 2010), an event-driven block-based visual programming language developed as a teaching tool by the MIT Media Lab. Visual programming tools support a relatively high level of control over the development process by allowing users with limited coding experience to witness the consequences of re-arranging code in real time. Giorgia then developed the Catch Game in the popular game design software GameMaker Studio.

[2] The Sà'án Sàvĭ Catch Game has been enormously improved by comments from John W. Du Bois, Terry Du Bois, and Brady Moore.

Figure 1
Screenshot of the Sà'án Sàvĭ Catch Game



The game is a side-scrolling catch game: players use their keyboard arrows to move the character horizontally across the screen. Food items fall towards the ground from random positions at the top of the screen, and players catch them to earn points. To make the game more challenging and incorporate an educational message about healthy eating, soda and fries are worth negative points. When an item is collected, the Sà'án Sàvĭ term for the item appears on the screen while an audio recording of its pronunciation is played (see Figure 1). To facilitate vocabulary learning via repetition, the first level of the game begins with just a few items; players unlock more items at each level. Additional lexical domains can be added in future development phases.

A pilot version of the game is available on GitHub[3] as an executable for Windows. We aim to compile an HTML5 version of the game because smartphones are cheaper and more readily available to the Mixtec community, and easier to connect to the internet in the absence of a stable network connection. The code has been released under a Creative Commons noncommercial share-alike license. In the future, we plan to release tutorials explaining how to create language packages for other varieties and languages.

For people involved in collaborative language revitalization projects, the most interesting feature of this game is the way localization into different languages is supported (YawningDad, 2019). The game currently supports Sà'án Sàvĭ, Spanish, and English; users select a language in the opening screen or cycle through different languages by pressing a specific key while playing. We created a JavaScript Object Notation (JSON) dictionary for each language to be displayed. JSON is an open standard file format that employs human-readable text to store and transmit data. In a JSON dictionary, data objects are organized in key-value pairs where the key must be unique, whereas values can be repeated. Each glossary contains the same keys, and the values associated with each key specify the string of text to be displayed in the selected language (Figure 2).

[3] https://github.com/gtroiani/yucunani_catchgame

Figure 2

JSON dictionaries for Spanish (left) and Sà'án Sàvĭ (right)

```
{
"locale_code" : "es",
"food_bean" : "frijol",
"food_peach" : "durazno",
"food_caldo" : "caldo",
"food_chili" : "chile",
"food_chicken" : "pollo",
"food_corncob" : "olote",
"food_egg" : "huevo",
"food_fish" : "pescado",
```

```
{
"locale_code" : "mx",
"food_bean" : "ntuchĭ",
"food_peach" : "nche'é",
"food_caldo" : "kántù",
"food_chili" : "ya'á",
"food_chicken" : "chùún",
"food_corncob" : "saĭn",
"food_egg" : "ntìvĭ chùún",
"food_fish" : "chakă",
```

A unique two-letter code at the start of the file identifies the language variety. The keys are used as variables identifying the text called by different functions. For example, a function might display the word for 'bean' by calling it in the following way: *draw_text(x,y, localize("food_bean"))*. When the user selects a language, the software cycles through different JSON files to the one containing the desired variety (identified by the two-letter locale code) and calls the values in that file to fill the corresponding key slots. Provided that a dictionary is present and that glosses are correctly linked to their key, any language could be represented in the game.

New language packages can be loaded in the game independently of the game itself. Speakers and advocates of other varieties who do not wish to redevelop the game by themselves can download a JSON dictionary, translate each value into the corresponding term of their variety of choice, and load a new localization file on their local machine to enjoy immediate results. Contributors may permit users anywhere in the world to access material in their variety by uploading their file to our GitHub page.

The simplicity of the JSON data format combined with the possibility of generating and implementing new glossaries on the local machine are particularly desirable features which move towards a distributed collaborative model and encourage users to contribute material from their own varieties. By making it easy for users with limited technical skills to directly change the data presented in the game, we minimize the level of control by community-external agents, in keeping with the open-source philosophy informing our work. This framework, directly inspired by the DIY hacktivist culture (Milan, 2016), removes technical obstacles and the need for an expert figure so that community members can fully control the modalities of data usage and presentation.

Website

Our website serves as a hub to organize and present materials and initiatives related to Sà'án Sàvĭ ñà Yukúnanĭ (https://sites.google.com/view/saansavi-yucunani); it facilitates decentralized creation of various projects on platforms best suited to them and keeps everything connected and discoverable. Our social media accounts and other projects link to the site, so that people who engage with any of them can find other materials. The aim, not yet fully realized, is for the website to be a self-managed data-sharing platform for community members in both the US and Mexico. In choosing Google Sites we prioritized the principle of usability over technological independence to allow community members without extensive technical training to edit and manage the site; it is simple to adjust materials and add new sections as desired. It also integrates well with Google Drive, providing a file storage system for materials.

The most extensive tab on the website, "Skua'a / Learn / Aprende," contains a variety of language-learning materials, including vocabulary posters and printable games produced as

part of the 2019-2020 Field Methods class, the video game described in §3, YouTube videos, and links to an online dictionary and phrasebook. Word-of-the-day posts from social media (*Tù'un kìí vichi*, see §5) are also available here. Additionally, there is a collection of illustrated texts, including traditional stories and personal narratives such as *Tá nìkìtsàà-yù Estados Unidos yó'o* 'When I arrived in the US'. We hope that sharing stories in Sà'án Sàvĭ from the US helps maintain community connections internationally. Additional tabs contain COVID-19 information in Sà'án Sàvĭ ñà Yukúnanĭ, academic presentations about the variety, and a GoFundMe page for collecting funds to print materials.

Internet access is expanding in Yucunani and surrounding areas, so we expect web materials to be increasingly important there as well as in the diaspora, with increased opportunities for communication and collaboration. However, printed materials remain important, potentially reaching people who might not engage with digital materials, providing opportunities for in-person interaction in Sà'án Sàvĭ, and increasing the visibility of the language. Having printable materials online allows them to reach beyond the limited personal networks through which we can distribute professionally printed materials. For example, posters shared via social media and the website have been printed and hung in schools in Ñuù Xnúvíkó / San Juan Mixtepec (see Figure 3), Yucunani's municipal seat.

Figure 3

Tweet in Spanish showcasing the materials in Sà'án Sàvĭ ñà Yukúnanĭ in a bilingual school in Mixtepec, @onica_aguilar. Used with permission.

Since the functionality available in Google Sites is fairly basic, projects requiring more specialized architecture are developed separately and linked to the Google site. For example, we are working with database developer Kim Rowden of Britican Software to create an online dictionary and phrasebook. As with the other projects, the goal is to build a tool that will be easy for members of the language community to use and manage. The trilingual searchable dictionary organizes and presents vocabulary collected as part of the Field Methods class and ongoing research. It allows easy adding and editing of information by authorized users, including recording audio and video through the browser. The phrasebook tool aims to provide

an accessible way to start conversing in Sà'án Sàvĭ and is a browsable complement to the search-based dictionary. Each page presents phrases and short conversations on a theme. We have chosen phrases that are conversationally natural and culturally relevant in Sà'án Sàvĭ, rather than translating what might be expected in a Spanish or English phrasebook. For example, we include the phrase *Á nìkìtsàà và'ŭ?* '¿Llegaste bien? / Did you arrive well?', which is the natural greeting to someone who has just arrived in a place, and we do not include any equivalent to 'Mucho gusto / Nice to meet you', which is not a typical expression in the Sà'án Sàvĭ context. Translations are provided in Spanish and English, and each Sà'án Sàvĭ phrase can be listened to as well as read. As with the dictionary, it will be easy to add additional pages and phrases with accompanying recordings.

Social Media

Another component of the project is the creation of a stable social media presence, aimed at diffusion of materials as well as community building. We wanted to let people know about the resources on our website and were inspired by Facebook pages dedicated to other Mixtec varieties[4]. We started with Facebook (Yucunani Sà'án Sàvĭ), Twitter (@yucunani), and Instagram (@yucunani_saansavi) as we had observed a sizable presence of Indigenous peoples from Oaxaca on these platforms. In addition, there is plenty of literature on how social media (Coronel-Molina, 2019; Jones & Uribe-Jongbloed, 2013) platforms such as Facebook (Belmar, 2020b; 2020c; Belmar & Heyen, 2021; Reershemius, 2017), Twitter (Belmar, 2020b; Cassels, 2019; Jongbloed-Faber et al. 2017; Lillehaugen, 2016; McMonagle et al. 2019), and Instagram (Cassels, 2019; Jongbloed-Faber et al., 2017) have been used to develop breathing spaces (Fishman, 1991) for minoritized and indigenous languages (Belmar & Glass, 2019; Cunliffe, 2019).

Once the platforms were chosen, we decided on the content we would share to engage followers and build a community interested in Sà'án Sàvĭ. Drawing from Guillem's experience with the #europeminoritylanguages project and in order to ease the time burden of content creation —a major hurdle when establishing a social media presence with scarce funding— we focused on a "Word of the Day" format. Following the basic Vocabulary List for elicitation in Mesoamerican languages (Campbell, 2019), each day we share a word in Sà'án Sàvĭ ñà Yukúnanĭ, together with Spanish and English translation. To make our posts more aesthetically appealing, we use Canva.com to create cards that combine pictures with words (see Figure 4). This last step has proven much more time-consuming than expected, and once a week we dedicate about an hour to content creation. However, the effort pays off, as interaction with our posts is considerably high, and the vocabulary cards can be repurposed as study material. On the downside, time constraints and luck of funding often translate into an outside researcher creating materials on their own, rather than in collaboration with the community member.

[4] For example, *Let's Learn Mixteco* (https://www.facebook.com/Lets-Learn-Mixteco-112413123559114), *Mixteco Bajo* (https://www.facebook.com/Mixteco-Bajo-109603600791839), and *Aprende Mixteco de Yucuhiti* (https://www.facebook.com/aprendiendomixteco).

Figure 4
Example of the trilingual Word of the Day cards developed with Canva.com

The vocabulary cards act as a rallying point as well as an advertisement that draws people to our profiles, where we also showcase other materials from our website. We occasionally post other content such as trilingual texts, games, or vocabulary resources to point people with interest in Sà'án Sàvĭ to the resources on our website.

One way to ensure our posts reach interested users is by choosing the right hashtags. Hashtags have been described as indexing tools for topic, identity expression, and language use (McMonagle et al., 2019), while helping design the desired audience for posts (Belmar, 2020b)—referee design (Bell, 1984). We envision the audience of our posts to include Sà'án Sàvĭ speakers, other community members in Oaxaca and the diaspora, other Indigenous people from Mesoamerica, and others with an interest in Otomanguean languages or indigenous languages in general. We use the endonym #Sà'ánSàvĭ, as well as a toneless #SaanSavi version without the "saltillo", as it is not a character easily found in mainstream keyboards in the US or Mexico. In addition to these two hashtags, we added the more widely known names of #Mixtec and #Mixteco, together with the hashtag #Yucunani to specify the variety of Sà'án Sàvĭ featured in our material.

While we recognize the importance of all sorts of participation and engagement with social media in minoritized languages (Belmar & Glass, 2019; Belmar & Heyen, 2021), including hidden participation (Belmar, 2020c, p. 122), we acknowledge that quantifiable engagement with social media posts provides some measure of (relative) success. For example, our Instagram posts register an average of 7 likes per post among just 58 followers. Twitter also shows strong engagement, with even more likes per post and an average of 6 retweets. More interestingly, our Twitter posts elicit answers from users who speak other Mixtec varieties or other Mesoamerican languages, where users share vocabulary to create a sense of a larger Indigenous community (see Figure 5). In order to foster exchanges, we regularly respond with Yucunani words to other profiles, expressing our interest in the digital presence (Belmar, 2020a; Soria, 2016) of other Mesoamerican languages.

Users' metalinguistic reflections in the comments of social media posts foster awareness of differences between varieties; for example, the Yucunani word of the day yù'và 'thread' prompted a speaker of another variety of Mixtec to share his words yù'vè 'thread' and yù'và 'ice'. The differences reflect how Sà'án Sàvĭ ñà Yukúnanĭ has changed original *e to /a/ in certain contexts, which in turn led to a speaker of Sà'án Sàvĭ ñà Yukúnanĭ explaining that both 'thread' and 'ice' are yù'và in their variety. In addition, Comunidad Elotl approached us on our social media to start a collaboration that will allow us to add Sà'án Sàvĭ ñà Yukúnanĭ in their Mixtec-Spanish parallel corpus (Comunidad Elotl, 2021).

Figure 5

A user reply to a Word of the Day tweet sharing the equivalent expressions in Chalcatongo Mixtec, @Eps5371. Used with permission.

Conclusion

We have presented three components of a digital language revitalization project that were initiated at the request of a community member and developed collaboratively with other researchers. The main goal of this work is to share outcomes of two years of documentation efforts in ways that can involve both the community in Yucunani and those living in the US. To this end, our efforts focus on creating digital tools that are easily accessed and used by community members anywhere, while providing space for online interaction.

We use a variety of platforms, ranging from mainstream corporate platforms (Google, Facebook, etc.) to community-controlled and self-built applications, such as the Sà'án Sàvĭ Catch Game. Mindfulness of who controls online shared data is of utmost importance, and our project components illustrate different options, each with its own tradeoffs. The Sà'án Sàvĭ Catch Game gives us complete control over the data and gives community members control over their own possible localizations of the game in other language varieties. The Google Site offers a platform that, although ultimately controlled by Google, facilitates website management for everyone regardless of computational expertise. Finally, our social media presence comes with big commercial platforms' more laissez faire approach to data protection, but in return reaches a wider audience. The components are integrated, reaching people on social media and presenting materials on the website, but each could also stand alone if that would better fit community needs. This approach illustrates the role of cyberspace as a locus for language revitalization in diaspora situations (see Coronel-Molina, 2019), and the virtual communities developed in social media platforms function as breathing spaces for community discussion and engagement (see Belmar & Glass, 2019).

A key aspect of these digital tools is that every aspect of them was designed envisioning a moment in which the outsider researchers would no longer be needed. This approach informed our decisions about software, hosting platforms, formatting, etc. Provided there is

funding for community members to take up the roles of maintaining the tools, outside researcher roles can recede following community training.

One area where we expected the transition to community management to be faster was on social media. Creating content and managing accounts is time-consuming, and due to funding constraints, this has fallen mostly on outside researchers. Funding for a social media manager from the Sà'án Sàvĭ community would allow greater community control and facilitate wider engagement with the project. A community social media manager would be able to answer questions directly, conduct outreach, get feedback from a range of community members, and generally tend a virtual space for the language.

We hope our work will create infrastructure and momentum that can be carried on by community members both in Yucunani and in the diaspora, according to their needs and desires, as ultimately, the community should lead the way in their own language work (Julián Caballero, 1999, p. 129). We believe that digital technologies have great potential to connect diasporic language communities, especially when accessibility and community control are included as part of the design process.

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