Systemic Ecologies of Heritage Language Maintenance in Immigrant Families

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This paper explores how immigrant families use digital technologies to support heritage language (HL) maintenance within an ecological systems perspective. Guided by Bronfenbrenner's Ecological Systems Theory and the Family Language Policy (FLP) model, it examines how families engage with and navigate affordances for HL practices across different layers of their lives, from home routines and community interactions to digital networks and broader sociopolitical structures. Immigrant families show remarkable resilience and creativity in adapting and mobilizing these tools, but sustainable HL maintenance requires more than individual family effort; it requires systemic change through inclusive policies, equitable access, and culturally responsive digital resources.

Key words: Heritage language maintenance, ecological systems theory, digital technology, family language policy

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Introduction

Language acquisition and maintenance are not isolated or purely cognitive processes; rather, they unfold within dynamic, interdependent ecological systems encompassing physical, social, cultural, political, and increasingly, technological dimensions (Bronfenbrenner, 1979; van Lier, 2004). For immigrant families raising children in host societies where heritage languages (HLs) often occupy a marginalized position, these interrelated systems shape the everyday realities of language development, maintenance, and intergenerational transmission (Curdt-Christiansen, 2016).

In the frequent absence of strong and formal institutional support for HLs, immigrant families show remarkable resilience as they create their own pathways to sustain their children's linguistic and cultural continuity (King et al., 2008; Curdt-Christiansen & La Morgia, 2018). One of the most transformative developments in recent years is the growing use of digital technologies. These spaces are not just tools for communication; they are translocal social and cultural spaces where family ties, cultural values, language practices, and even beliefs about language are shaped, challenged, and reimagined (Kelly-Holmes, 2024; Hatoss et al., 2024).

Within the ecological perspective, the concept of *affordances* helps explain how families engage with these technologies. Affordances refer to the opportunities for learning and interaction that emerge through the relationship between individuals and their environments (van Lier, 2004). They are not fixed features of digital tools or inherent capabilities of users; rather, they arise from how families interpret and use what digital tools offer (van Lier, 2004). In the context of HL maintenance, digital affordances become visible when immigrant families creatively and meaningfully draw on technology to support their children's HL use and cultural identity (Liu, 2021).

To better understand how digital tools mediate HL development within immigrant families, this review draws on two complementary perspectives: Bronfenbrenner's Ecological Systems Theory (1979), which conceptualizes human development as unfolding across nested, interacting systems, from immediate home environments to broader societal structures, and the family language policy (FLP) framework (Spolsky, 2004; Curdt-Christiansen, 2016), which highlights how language ideologies, management strategies, and daily practices operate within families under both internal and external dynamics. Together, these perspectives provide a way to explore how immigrant families, through agency, resilience, and a sense of ownership (Mora, 2014), engage with the digital world to support their HL continuity. More specifically, this review draws on current research to examine how digital technologies function across four ecological levels—microsystem, mesosystem, exosystem, and macrosystem—highlighting the layered challenges and opportunities immigrant families face in nurturing their children's HL development (Piller, 2016; Curdt-Christiansen, 2016).

1. Microsystem

In Bronfenbrenner's (1979) ecological systems theory, the microsystem represents the closest layer to an individual, encompassing the immediate environments where daily interactions occur, most notably the home, and increasingly, the digital space embedded within it. In immigrant families, these settings are where HL practices are lived and experienced more often through everyday routines rather than formal instruction (Spolsky, 2004; Curdt-Christiansen, 2016). These daily moments are where families put their language beliefs and goals into practice in subtle, meaningful ways.

Within this context, digital affordances emerge from families' active engagement with technology (van Lier, 2004; Little, 2019). Communication tools such as WhatsApp, FaceTime, and Telegram enable both synchronous and asynchronous interactions with extended family members abroad, embedding HL use into daily routines such as greetings, storytelling, and advice-seeking. Asynchronous features, such as voice notes, allow for repeated exposure to HL input, offering additional opportunities for exposure and meaningful use beyond immediate conversational contexts (Curdt-Christiansen, 2013). These exchanges are often pragmatic and emotionally charged, contributing to both the child's linguistic development and emotional well-being.

Entertainment also plays an important role. HL cartoons, family shows, and music videos accessed through streaming platforms normalize HL use while making it enjoyable. These moments are not only fun but can also be linguistically rich, offering vocabulary, rhythm, and expressions in context (Little, 2019; Makarova & Xiang, 2024). Reading apps and audio stories can become part of routines like bedtime, offering repeated exposure to HL (Pagé & Noels, 2024). Even video games, if available in HLs, can open space for cousins and friends abroad to play and speak the language naturally (Gee, 2004).

Altogether, these daily digital engagements make the HL more visible and usable in ways that are sustainable and grounded in real life. They reflect the *practice* dimension of FLP (Spolsky, 2004; Curdt-Christiansen, 2016), where language development is embedded in the flow of everyday life. Such family-initiated moments transform digital technologies into relational and affective learning spaces (Hatoss et al., 2024) which strengthen the child's connection to their HL and identity. Still, these practices do not happen in a vacuum. Families' ability to draw on digital tools for HL support depends on broader factors, such as access to HL resources, community networks, and how society views minority languages (Curdt-Christiansen, 2018). The microsystem is where HL maintenance begins, but it is shaped by, and connected to, wider layers of the ecological system.

2. Mesosystem

The mesosystem refers to the interconnections between individuals' immediate environments, such as home, community, school, and digital spaces. For immigrant families, this layer plays a key role in shaping how HL exposure is managed and how HL practices extend beyond the household (Curdt-Christiansen, 2016). It is within these intersecting spaces that parents often take on the role of gatekeepers, making intentional choices to guide their children's language use across different contexts to maximize HL affordances.

One way families support HL maintenance is by curating or creating digital content that reflects their language and culture. Whether it's sharing community news, posting storytelling videos, or circulating announcements for cultural or religious events, these practices help bridge home language use with broader ethnolinguistic networks (Liu, 2021). In doing so, families expand the reach of HL beyond the private space of the home, creating a sense of belonging and continuity in digital communities.

Parents also play a hands-on role in guiding and regulating their children's digital engagement. Many seek out apps, websites, or media that support HL learning, whether explicitly educational or more informal, like music or cartoons (Little, 2019; Liu, 2021). These *curated* affordances (Georgakopoulou, 2021) are not accidental; they are deliberate efforts to make HL exposure both accessible and desirable. Hatoss et al. (2024) describe these efforts as

part of *family digital ecologies*, where home values, media choices, and learning come together to create rich spaces for HL use and development.

Importantly, these affordances are not neutral and are often filtered through the family's ideologies. Families are often negotiating against a backdrop of dominant-language content, especially English, that is constantly reinforced by biased platform algorithms and broader ideologies (Kelly-Holmes, 2024). In doing so, they assert control over their child's digital environment by making decisions that reflect their beliefs about language, culture, and identity (Curdt-Christiansen, 2016).

Affordances in the mesosystem are fluid and subject to change. As children grow, gain digital autonomy, and expand their online engagement, parents find themselves re-evaluating and renegotiating these affordances. This requires flexibility, digital literacy, and ongoing reflection about what HL exposure looks like in a changing world (King et al., 2008; Curdt-Christiansen, 2018).

In this way, the *management* dimension of FLP (Spolsky, 2004) emerges as a dynamic and relational process that positions families not merely as consumers of HL digital content, but as planners and educators who co-construct linguistic spaces through affective, agentive, and multimodal practices (Hatoss et al., 2024). They are not just reacting to external forces, but actively creating the conditions in which HL can be nurtured.

3. Exosystem

In Bronfenbrenner's (1979) ecological model, the exosystem includes settings that individuals, in this case immigrant children, do not directly participate in but still influence their everyday experiences in meaningful ways. In the context of HL maintenance, exosystems can include digital spaces like diaspora networks, parenting forums, and multilingual family groups. Although parents may not control these spaces, they engage with them regularly, which offers powerful affordances for ideological support, resource sharing, and community building (Curdt-Christiansen, 2016; King et al., 2008).

Participation in these digital communities gives families access to collective knowledge about HL maintenance strategies, culturally sustaining practices, and educational resources. Through dialogue and shared stories, parents negotiate or affirm their language ideologies and management strategies, and deal with the deficit-based narratives often reinforced by dominant discourses (Curdt-Christiansen, 2016; Piller, 2016). These digital spaces help families co-construct shared narratives about language, identity, and belonging, therefore, HL maintenance becomes a collective effort tied to collective resilience, cultural pride, and even resistance to assimilation (May, 2012). Here, the *ideology* dimension of FLP (Spolsky, 2004) takes shape not just within individual households but through broader networks of social support and shared understanding.

At the same time, these affordances are not equally available to everyone. Families with stronger digital skills, more linguistic capital, or socioeconomic resources are often better positioned to benefit from these communities (Piller, 2016). Therefore, while digital communities offer significant potential for ideological support, practical resources, and a sense of empowerment, they can also reflect and reproduce the same social inequalities that exist offline.

4. Macrosystem

The outermost layer in Bronfenbrenner's (1979) ecological model, the macrosystem, encompasses broad ideologies, socioeconomic structures, and policy frameworks that shape all other layers of development. In the context of HL maintenance in immigrant families, the macrosystem sets the overarching conditions under which digital affordances are accessed and experienced.

In today's digital world, these macrosystemic forces manifest through platform algorithms, advertising models, and global media flows that consistently prioritize dominant languages while marginalizing minority ones (Makarova & Xiang, 2024; Piller, 2016). Even as they are praised for linguistic diversity, digital technologies often operate within commercial ecosystems that privilege dominant-language content (May, 2012). As a result, immigrant families often struggle to find meaningful and accessible HL content or see their language practices authentically represented in digital spaces.

These patterns are reinforced by national education and media discourses that often frame HLs as private or cultural extras rather than public resources, leaving families who prioritize them feeling marginalized or questioned about the practicality of their efforts (Piller, 2016; May, 2012). Such framings can shape how families perceive their language goals; whether they feel empowered, discouraged, or somewhere in between (Curdt-Christiansen, 2016). From an FLP perspective, the macrosystem reveals that HL maintenance is not merely a matter of personal choice or access to tools but is shaped by broader forces (Spolsky, 2004; Curdt-Christiansen, 2018) that influence which languages are seen as legitimate, valuable, or worth maintaining.

Families may be doing creative and meaningful work across the micro-, meso-, and exosystems, but without changes at the macrosystemic level, like inclusive language policies, equitable platform design, and more supportive public narratives, those efforts can remain fragmented and unequal. As Hatoss et al. (2024) point out, supporting HLs in digital, translocal contexts requires a shift in how we think about language planning. It's not just about preserving HLs, it's about creating inclusive and flexible spaces where youth, families, and communities can engage with language in ways that reflect their needs and identities.

Conclusion

HL maintenance in immigrant populations is not merely a private or individual task; it is an ecological process shaped by daily routines, community dynamics, digital participation, and broader sociopolitical forces (van Lier, 2004; Piller, 2016; Curdt-Christiansen, 2016; Hatoss et al., 2024). Immigrant families are not passive recipients of external pressures; they are active agents who thoughtfully and resourcefully shape their children's linguistic environments. These efforts deserve recognition not only within families and communities but also in wider conversations on language policy, educational practice, and digital innovation.

While much attention has been paid to how macrosystemic forces influence FLPs, the flow in the other direction is equally critical. Everyday HL practices, often overlooked, can offer valuable insights that should inform the development of more inclusive and responsive resources, technologies, and policies. Macrosystems must not only shape family practices but also learn from them. Recognizing this reciprocal, non-hierarchical relationship is essential for building systems that genuinely support and empower immigrant populations.

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