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"Is there an app for that?" Exploring games and apps among heritage language families

Heritage language families inhabit multiple languages, literacies and cultures. Enabling children to participate in heritage language and culture has beneficial effects in terms of identity, and cognitive development. Games-based technologies are opening up avenues for playful engagement with heritage language and literacy, but little is known about how families use such technology to support heritage languages.

This paper seeks to address this gap, reporting an original study of the relationship between heritage language families and games-based technology for heritage language and literacy development, in terms of attitude, attached values, and use. A survey involving 212 heritage language families, followed by ten interviews, most of which included children, explored families' attitude towards and use of games and apps for heritage language development, whilst focusing on how these technologies link to children's self-awareness as heritage language speakers. Significantly, the study concludes that both children and parents differentiate between being 'learners' or 'players', and that collaborative family practices may help children overcome barriers not only in the way they access technology, but also how this technology impacts on their relationship with the heritage language.

Keywords: heritage languages, language learning, family, technology, motivation

Introduction

With society becoming ever more "super-diverse" (Vertovec 2007), it is increasingly important to understand the needs of multilingual families, and how society is equipped to meet these needs. At a time when claims are made that 'there's an app for that' (Apple), this original study explored heritage language families' relationship with games-based technology, in particularly focusing on parental and children's attitudes, examples of use, and links between apps and games and children's identity construction. Specifically, the research questions are:

What are heritage language families' attitudes to using games-based digital technology for heritage language and literacy development?

How do these attitudes link to children's perceptions of themselves as language learners or speakers?

While family use of technology is well-researched in areas of monolingual literacy development and in the field of second language acquisition, heritage language families do not neatly fit into either category, creating a niche which has as yet received little attention, but which is becoming increasingly important as global mobility increases. This study is situated within this niche, providing insights drawn from 212 web-based questionnaires and ten in-depth interviews with heritage language families, exploring parental concerns around technology use, as well as seeking to understand the specific needs of heritage language children, and where they might "fit" in the global market of apps and games.

This paper first explores the literature around heritage language families and parental attitudes towards technology, as well as seeking to understand the specific role heritage language children play in the current market of available resources, before outlining methodological and ethical considerations. The findings return to the themes identified in the literature review, exploring family attitude and use of technology to support the heritage language.

What is known about heritage language families and new technologies

Defining heritage language

Research among families who speak more than one language is situated against a complex background which refers variously to: immigrant families (Szecsi and Szilagyi 2012; Portes and Rumbaut 2001), bilingualism or multilingualism (Baker 2011) plurilingualism (Prasad 2013), home language (Eisenchlas, Schalley and Moyes 2016) and heritage language (Szecsi and Szilagyi 2012; Cho and Krashen 2000). Throughout this paper, the term heritage language' is used, since the vast majority of families had views of the 'heritage language' that aligned with Blackledge and Creese's (2008) interpretation, namely a minority language not spoken by the majority within the

community or country, with both language and culture being passed down the generations. Within the context of this study, all languages other than English are referred as heritage languages.

Heritage language families

From birth, children inhabit a "cultural niche" (Boyd, Richerson and Henrich 2011), influenced by the cultural beliefs, customs, and practices of those around them. For heritage language families, these customs, beliefs and practices form a complex pattern of family life. Language holds an important place within this niche, facilitating communication with caregivers, community members, education professionals, classmates, and friends. Different languages may support different ties, and relate to children's lives in terms of cognitive development (Baker 2011) and their developing cultural identity (Norton 2013; Pavlenko 2004).

Family efforts are vital in maintaining the heritage language (Garrett, Coupland and Williams 2003), with the home environment and language habits of the families being the most accurate predictor of heritage language development (Fishman 1991). Many families facilitate the heritage language through spoken communication within the family, and through travelling to the home country, joining local groups, or using additional resources, such as books or television (Tse 2001; Cho and Krashen 2000), however, the use of apps and games within this context is as yet largely unexplored, necessitating a more over-arching look at technology use.

The role of technology in heritage language and literacy development

Much of the literature on virtual language and literacy development originates in the fields of either mother tongue literacy (Merchant et al. 2012; Kucirkova et al. 2014), or foreign or second language acquisition (Chik 2014; Viberg and Grönlund 2012). While

space does not permit a comprehensive review of the full body of literature, it is not untypical for the foreign/second language learning field to focus on individual aspects of language and literacy development, including vocabulary (Ashraf, Motlagh and Salami 2014), and writing/story telling (Kucirkova et al. 2014).

The use of technology (and in particular, commercially available games) among heritage language families remains under-researched, in particular, whether and how parents and children view the available apps in similar terms, namely, for language learning, or for game play which happens to be in the heritage language. With nearly one in five primary school children in the UK alone being classed as having English as an additional language (Tinsley and Board, 2016), this group of children forms a significant part of the population not just in the UK, but worldwide, allowing this study to make both a timely and significant contribution to our understanding of technology use among heritage language families.

Among the few studies exploring this particular field is a pilot study in Australia (Eisenchlas, Schalley and Moyes 2016), which used three specifically-designed games to explore literacy development in the minority language (German) of nine children aged 5-8, finding improvement in literacy development in the minority language, and satisfaction and motivation among children and parents with regards to the games. Szecsi and Szilagyi (2012) explored the perceptions of two immigrant Hungarian families on the use of media technology and heritage language development, with both families responding positively. These small pilot studies make an important start in highlighting an emerging field, which this study extends by juxtaposing parents' desire to support the heritage language with concerns linked to mobile and screen technologies. This paper does not seek to belittle these concerns, instead, it aims to

explore this dilemma sensitively, involving both parents and children in the discussion. Furthermore, this paper significantly extends the discussion by exploring how the use of apps and games links to children's emergent identities as multilinguals.

Parental attitudes to technology

Since parents ultimately are their children's gatekeepers when it comes to accessing and using technology (Hamilton et al. 2016), exploring parental attitudes is an important aspect of this study, especially since culturally differentiated views on technology use remain under-explored. Atkin et al. (2014) Studies of screen time reported an increase in obesity among young children (see e.g. Hamilton et al. 2016; Sanders et al. 2016). The ability of parents to control screen time decreases with age, making the exploration of parental attitudes a matter of particular importance when it comes to families with young children (Hamilton et al. ibid). Parental attitudes matter when it comes to permission, and active support: Neumann and Neumann (2014) argue that while both quality and content of apps are important, they should not be viewed as a replacement for parental involvement. Throughout this study, care was taken to explore which apps were used, and how.

Availability of apps and games for heritage language children

Principally, commercial apps and games are not developed with heritage language speakers in mind. Instead, there is a duality in the availability of resources, with apps and games either aimed at new language learners (e.g. learning the language as a 'foreign' language), to support early literacy development (e.g. spelling/literacy apps for young children), or apps focusing primarily on game-play, in the heritage language, for fluent speakers. Heritage language children often develop their multiple languages

asynchronously, resulting in a specific set of needs (Baker, 2011). Among these needs is the concept of 'meaningful challenges' (Whitton, 2014) linked to game play. Whitton points out that 'edutainment games' - those designed with specific learning outcomes in mind – are typically less engaging, and devoid of meaningful interactivity.

In research among heritage language children, the focus is more frequently on the facilitation of the in-country (rather than the heritage) language (see e.g. the work of Verhallen and Bus 2010). What has been neglected so far is how gameplay links to the concept of identity, an aspect this study explores.

Methodology

The study asks:

> *What are heritage language families' attitudes to using games*-based digital technology for heritage language and literacy development?
>
> *How do these attitudes link to children's perceptions* of themselves as language learners or speakers?

This study adopted a mixed-method approach, facilitating broad data collection via an online questionnaire (212 responses), followed up with ten in-depth interviews, attended by between one and four family members. Children participated in seven of these interviews. Mayall (2008) points out that research is all too frequently done by adults in an attempt to understand children, and that generational differences ought to be a focus of research. With the availability of apps and games increasing rapidly within the generation spanning the parents and children in this study, seeking views from both generations was thus deemed especially important. Although some questionnaire

questions included Likert-scale-type responses in order to provide a broad overview, both questionnaires and interviews focused mainly on qualitative data in the form of open-ended questions, so as to elicit reasons, opinions and dynamics between family members more successfully. The quantitative data from the questionnaire was therefore primarily intended to triangulate, and to elicit potential themes for the overall interpretive research design. In this exploratory study, both research methods used English as the language of data collection. While this undoubtedly narrows the field of prospective participants, gaining insights from numerous countries and sources was the focus of this study – specifically, culturally and linguistically focused samples are intended to take place in future. The study received institutional ethical approval, and informed consent was obtained from all participants. No original names have been used in reporting the findings.

Online questionnaire

Volunteer questionnaire participants were recruited via social media posts, posted in six international and UK-based online parenting groups linked to heritage language or bilingualism. While this restricted the sample to those families already interested in facilitating the heritage language, and those frequenting social media, it was deemed a suitable medium to reach a large audience, since the initial posts got shared by a variety of additional parenting groups, increasing the overall reach of the study. An introductory paragraph to the questionnaire made it clear that views were sought from families living in the UK, seeking to provide an indicative picture of heritage language families whose children are part of the UK education system. This approach ensured that English (with the easiest access to apps and games) was not classed as the 'heritage language'. While a future study may helpfully explore views of specific heritage

language groups or socio-economic backgrounds, this study focused on identifying families who felt they had a story to share. As can be seen from the data, not only technology-friendly families were recruited, although it may be possible that the study attracted participants with polar views, e.g. either fervent supporters or opponents of technology use. In total, the questionnaire logged 268 responses. After discarding double and blank entries, there were 212 viable responses available for analysis. Whilst data are incomplete, it is apparent that most respondents were mothers.

The questionnaire collected background data around family composition and which languages were spoken by whom (and to what extent) in the family. Certain aspects of the survey (such as emotional attachments to the heritage language) have been reported separately (Little, 2017). Of specific importance to this article are attitudinal questions about technology use (both for parents and for children), usage patterns with regards to technology, and comments linked to children's or parents' identity perceptions in relation to technology use.

Family interviews

The questionnaire included the option to volunteer for interview. In order to explore gaps in the literature surrounding younger language learners' voices, these volunteers were first categorised according to children's age, aiming to identify those at primary school (aged 5-11). Thirteen volunteering families fitted this criterion. These families were approached, and, following some scheduling issues, ten families completed the interview. A simply worded information sheet and consent form ensured that all family members (including children and those less confident in the English language) would be able to understand them. Forms were emailed out, and all family members involved in interviews signed them. Families photographed or scanned the forms before returning

them via email, and the content was reiterated, with verbal consent sought again, before interviews started.

In seven of the ten family interviews, children were present and offered their own views. Although it is impossible to exclude parental influence in a study such as this, the sample group was such that parents were, in all cases, actively encouraging children to share their own views, since the parents themselves had a vested interest in understanding their children's motivations in relation to heritage language learning. Caduri (2013) points out that, while 'truth' is necessarily a flexible concept in qualitative research, relying on remembered instances and interpretation of events, eliciting qualitative responses nevertheless serves to highlight previously unexplored issues. In the case of this study, having both parents and children present strengthened the data by facilitating a dynamic, relational approach, allowing for triangulation of experiences from different viewpoints.

Questionnaire responses were taken as a starting point for the interviews, with responses being expanded further through additional questions focusing on capturing family narratives and stories around technology use, favourite apps or games, family practices (such as regulated screen time), and attitudes of parents and children towards technology use.

Interviews with nine families were conducted by video-call (Skype), one mother preferred the telephone. All interviews were fully transcribed. While the use of Skype as an interview tool may hinder the interpretation of non-verbal cues and make it more difficult to establish rapport (Lo Iacono, Symonds and Brown 2016), advantages included the possibility to draw on a wider sample, and to make the research financially

feasible (ibid). In addition, nine of the ten families interviewed used Skype regularly to speak to relatives abroad, making the tool familiar to both the parents and the children, and helping to minimise negative impact. While the interviews were semi-structured, participants were aware that, as a parent of a heritage language child, I occupied the same 'space' as them. The interviews frequently continued beyond the official questions, and beyond official recording, evolving into an exchange of experience, and, on occasion, co-constructing knowledge (Mann 2011) with the parents. While these data were not included in the study, to avoid researcher input leading responses, these exchanges were seen as an ethical way to acknowledge the time families dedicated to their participation (Bagley, Reynolds and Nelson 2007).

Ethical Considerations

Voltelen, Konradsen and Østergaard (2017) warn of ethical issues related to interviewing families, either together or apart. Their review of the literature highlights how the expression of contradictory views may damage family relationships. Both the drive to maintain the heritage language, and the discussions around control and use of technology, are topics fraught with strong views and are potentially long-standing familial "battle zones", and interviews were conducted carefully and sensitively, with family well-being at the centre of ethical considerations. All participating parents voiced their interest in the study, and nine out of ten indicated that their motivation to participate was to identify future ways of negotiating both the heritage language and the use of technology with their children. It was therefore important to explain to both parents and children that listening to each other was important, and that sharing opinions honestly and without fear of causing offense was not only beneficial to the research, but also for future family relationships.

Approach to Data Analysis

In order to ensure robust findings, data collection adopted a rigorous approach, combining questions linked to certain pre-determined themes dictated by the research questions (technology use, attitude towards both technology and the heritage language, as well as links to identity) with open-ended questions which allowed for further expansion into sub-themes (such as further outlining access to and availability of resources), as well as new, emerging areas for investigation (e.g. parental fears). Quantitative data were analysed using descriptive statistics, while a coding framework was developed which allowed text and interview data to be grouped or 'chunked' (Bamberger and Schön 1991), before parallels were identified and explored. This framework led to the identification of close links between family's various emotional and pragmatic attachments to the heritage language on the one hand, and their concept of identity on the other hand, aspects which are further explored in Little (2017). This paper, while still exploring aspects of identity, is fully focused on the data linked to technology use. For the families involved in the in-depth interviews, both questionnaire data and interview data were combined to triangulate the data and provide a fuller picture of each family's situation, focusing on the narrative of the heritage family in each familial context. The findings which follow draw on the full data set, focusing on the pre-determined themes in turn, and the exploration of sub-themes where appropriate.

Sample

In order to situate the findings, a brief overview of the families involved is important. This exploratory study aimed to deliberately include as many different family languages as possible, in full awareness that findings would differ across the sample, especially in terms of availability of resources. Overall, more than 40 different languages were

spoken among the 212 responding families; there was a broad spread of languages, including those with many native speakers (e.g. Mandarin, Spanish, Hindi, Arabic), as well as some lesser-spoken languages (e.g. Icelandic, Maltese). The languages represented among the family interviews included Hindi, French, Italian, Chinese (Putonghua), Malay, German (x3), Russian, Japanese, Dutch, and Greek (two families spoke multiple languages). Apart from Hindi and Malay, all languages represented at interviews have a strong online presence, with considerable (though not equal) resources available. The preferred supported language in the family speaking Malay was actually Chinese (Putonghua). For all families who took part in the interviews, the children were born in the UK.

One third of all 212 families (33%) spoke more than one heritage language (other than English) in the home, which is of particular importance because availability of resources may influence which language is favoured by parents and/or children.

The questionnaire did not specifically ask about socio-economic background, however, parents, in their comments, made reference to academic studies and jobs requiring university-level qualifications, allowing the conclusion that most parents were educated to this level. All interviewed parents had university-level qualifications.

The age of children in the household differed widely, however, the vast majority (203 out of 212) had at least one child in compulsory education (aged 4-18). All ten interviewees had children currently in primary school (aged 5-11).

In the findings below, all qualitative responses are described according to method, participant/position in family, age of child, heritage language (e.g. Interview, Daughter, Italian, 10yo; Questionnaire, Father of 6-year-old boy, Dutch).

Findings

This study explored the attitude towards, and use of, technology in relation to heritage language development, among heritage language families, additionally seeking to understand how attitudes might link to identity construction. The sample was held deliberately broad, with many ages, languages, and cultural backgrounds represented. The purpose of the study is not to present generalisable findings, but to draw out the complexities facing heritage language families in this particular context.

Books vs. apps and games in heritage language literacy development

In order to understand what resources families were used, the questionnaire asked about a wide variety of resources – since books were the most used and referred to, and games and apps are the focus of this study, the resources relevant to these have been chosen for closer inspection. While bearing in mind the relationship between 'use' and 'availability', the following table outlines what percentage of the 212 families used some of the resources at least once a week:

Resource	**Used at least once a week**
Books	87%
Internet-based games	21%
Mobile apps and games aimed at language learners	20%
Mobile apps and games aimed at native speakers	20%

Table 1 Heritage language books and digital games/apps used among heritage language families

The study found considerable overlap between users of internet-based games and mobile apps – if families used one, they were likely to also use the other. Overall, 25% of families used technology-based games or apps to support heritage language and literacy development. In the majority of these families, technology co-existed with traditional book reading, providing additional exposure, rather than one type of resource being used at the expense of the other.

This was true across the various age ranges of children in the families, and is important, as the data contradict fears expressed by some parents, that their children's desire to use technology would somehow supersede the use of books in the household.

Data on technology-based games for heritage language learning

Looking for reasons behind the comparatively low figures for online and mobile games and apps, the survey explored accessibility, interest, and children's and parents' attitudes.

Access to Technology

All children had access to internet-ready technology at home: in 24% of families children had their own mobile device, and 12% had their own desktop computer. 54% of children used a parent's mobile device, and 36% used a family computer. All children in the survey therefore had access to the actual technology for online games and apps for language learning, thus making access restrictions ideological (i.e. parental decision), rather than lack of opportunity.

Interest in Technology

Interest in computer games was considerable, although overall, it was higher among the children than the parents. In the questionnaire, 66% of parents reported that their children were interested in computer games, 56% were interested in web-based (browser) games, and 82% of children were interested in mobile games and apps (with 65% of parents reporting such interest in themselves). This represents a significant proportion, echoing findings by Eisenchlas, Schalley and Moyes (2016). Simultaneously, 78% of parents reported that their child was interested in the heritage language, and 75% of parents believed that apps and games could motivate their child to learn the heritage language. Set against the finding that 25% use such technologies, there is a need to explore the reasons for this discrepancy.

Access to resources

The study suggests two broad reasons why more children do not make use of online games and apps to improve their knowledge of the heritage language: parental awareness, and parental attitude. A total 57% of parents wished that there were more games and apps available in their language, which shows that there is definite demand. However, even in a language with many speakers (e.g. Chinese), accessing appropriate apps and games could be an issue:

> Sometimes I find it a bit easier to find games that are targeted for children learning Chinese as a second language, sometimes I can find also just from mainland China. So for games it's a mixture.
>
> Interview, Mother of 5-year-old boy, Malay/Chinese

While some markets (such as Mandarin) thus cater explicitly for children growing up abroad, this was very much an isolated case. Finding and purchasing suitable apps was also an issue:

> I'm not willing to spend 2 or 3 or 4 or 5 or 8 pounds on an app that I may not like, because it's not as though you [can] take it back to the shop.
>
> Questionnaire, Mother of 8-year-old boy, Swedish

Although apps can be returned, buying online and negotiating different app stores obviously added to the complexities of providing games and apps for children, especially since, in all families, it was the parents who had to identify, source, judge, and ultimately buy apps and games in the heritage language, since children were unaware of what might be available, until the parents introduced them. Cultural references were important here, with both French (Tin Tin, Barbapapa) and German (Die kleine Hexe Lilifee) families making reference to resources tied to heritage country and culture. Differentiated regulations across different providers further complicate the expertise parents might need in order to take full advantage of apps and games available. This may help to explain why much of the research to date focuses on custom-made games (Eisenchlas, Schalley and Moyes 2016), rather than exploring the myriad of games openly available, but only used by few families.

Parental attitudes to technology

Some parents used the questionnaire open response questions to voice strong views about the use of technology, specifically, of games and apps:

> I am very strict regarding the use of technology, apps and games as I believe they can be harmful and addictive for young children.
>
> Questionnaire, Mother of a 5-year-old boy, French

This response was echoed by a total of six families across the questionnaire data, whose oldest child was 5 or under, a relatively small number, but more significant when considering that this sub-group (oldest child 5 or younger) comprised only 15 families in the whole data set of 212 families. In the interviews, one mother (again of a child similarly aged) gave further background:

> We have only tried one online game [Reading Eggs]. But it became boring very quickly, and so we didn't do any more. We haven't looked for any other online resources, and we don't want to. We would like to "minimise screen time". This

> is the approach that is most familiar to myself, I was taught how to read by my great grandmother, and of course, she didn't have a computer. What I am reading about screen time in the parenting magazines sounds negative. I would prefer my children to have time with a book. Screen time is addictive – when you say you are going to have 5 minutes with a screen, it turns into half an hour.
>
> Interview, Mother of 5-year-old boy, Russian

This mother is not the only one who explicitly referred to her own upbringing. The Japanese mother of a 5-year-old girl explained:

> I want her to be more interactive […]. My parents didn't want any of us to sit in front of television or screen to either watch cartoon or even to watch educational programmes, so I am also really strong opinion about it. I don't want her to be addicted to learn things on the screen.
>
> Interview, Mother of 5-year-old girl, Japanese

It is clear, and perhaps unsurprising, that parents of younger children show more concerns linked to the dangers of screen time (Hamilton et al. 2016), however, there also seems to be a lack of differentiation on what 'screen time' is used for. Some parents who were against screen time explicitly linked this to computer screens, rather than television screens, and the line between one and the other becomes blurred when one focuses on use (i.e. whether children watch or play), rather than device (i.e. computer or television). Similarly, screen time was linked to passivity, rather than interaction or engagement, and most typically as something the child would do alone, without parental involvement (Neumann and Neumann, 2014). While all parents interviewed mentioned shared reading of books, only one mentioned shared use of online materials in the heritage language – in this case, a homework website, rather than a game. While books are spoken about as a 'shared' resource, the language used by parents in terms of games and apps shows an expectation to 'motivate' and 'incentivise'. This suggests that parents' expectations of technology-enhanced language resources are more multi-faceted than their expectations of books – to not only facilitate

language learning, but to also motivate children to learn, often independently of the parents.

Some parents used 'gamification' to motivate children actively to explore heritage language or literacy development, regardless of their child's preferences. One mother reported:

> The gaming apps he likes, but there's another new one I'm getting him to do which is a Chinese writing [app], [which] sometimes I think it's like homework in a way so […] sometimes I find he's not doing it correctly.
>
> Interview, Mother of 5-year-old boy, Malay/Chinese

The app in question awards points for correct writing of Chinese characters, so while there is some level of gamification, it is a thinly-veiled learning app, of which both child and mother seem to be aware, with the mother differentiating between this app and 'gaming apps'. The mother's use of language ('getting' the child to 'do' the app, and having to do it 'correctly') points at a mismatch between traditional gameplay for enjoyment, and gamified learning (Whitton 2014), something the mother herself acknowledges when she says the app is 'like homework'. In another family (Italian-speaking, daughter aged 10), the father commented: 'the Holy Grail [of games or apps] is something that teaches you anything without you realising you're being taught'. These comments, then, necessitate a closer look at how children view themselves in this context, and the extent to which apps and games support or hinder their identity construction as heritage language speakers.

'Language Learners' or 'Game Players'?

The apps and games mentioned in this study were either aimed at non-native speakers of the respective heritage language (language learning apps), or native speakers of the heritage language, echoing Baker's (2011) argument that heritage language learners' needs may not be generally acknowledged in society. Unsurprisingly, the most

frequently mentioned apps were available in multiple languages, and, without exception, aimed at language learners (e.g. MindSnacks, Duolingo, Memrise). Most children were clear about their preferences and all interviewed children seemed well-aware of the difference, as one child explained:

> If the game is for people who speak English, then playing it is a bit like being in a classroom, but if the game is for proper German children, then playing it is like being free. It's just playing.
>
> Interview, Son, 8yo, German

Another child who stated she was not yet at a language level to play games aimed at native speakers expressed her wish for a more authentic gaming experience when learning the language:

> I absolutely love to game and stuff, I love Minecraft, Sims, all of that. […] I guess if [language learning] is in game format it kind of helps but it would need to sync in a bit more in that.
>
> Interview, Daughter, 10yo, Italian

Asked to explain further, the same participant stated that, while gamified vocabulary learning apps motivated her to progress through levels ("On Mindsnacks […] what I was trying to do is when you get to the highest level you get a little baby bird"), this gamification would make her race through the levels and, subsequently, quickly forget the vocabulary learnt. Both these older children struggled to identify their cultural niche (Boyd, Richerson and Henrich 2011) – while they could have accessed games aimed at younger native speakers, this did not mesh with their gaming preferences, forcing them to focus on their shortcomings in the heritage language, rather than their existing knowledge.

A desire for an immersive, realistic experience (Ryan and Deci, 2017) was expressed in the interview by the 10-year-old daughter in the Finnish-speaking family,

who explained what would make her engage with Finnish more would be ‘something that made everything everybody says speak Finnish, so like the whole….so like everyone I meet is like Finnish’.

The notion of game play as a social experience is also picked up on by the mother of the Dutch/Greek trilingual family, who explains what would be useful would be:

> a game in Greek that will be like, let’s say Star Wars but have Greek dubbing would be something that would help my kids. Because playing something modern that they actually know […] So I see that OK you might have educational apps but the truth is the kids want to play common things so that they can speak with their colleagues.
>
> Interview, Mother of 6-year-old boy and 5-year-old girl, Dutch/Greek

The importance of shared experiences between children and their peers is the focus of the Funds of Knowledge approach (Gonzalez, Moll and Amanti, 2005), and several of the children’s quotes illustrate that they are aware that their experience is different both from monolingual peers in the UK, multilingual peers in the UK who have a different heritage language, and peers in the heritage language country. Each family is thus a microcosm of experience, showing the relevance of a study which focuses on multilingual families not necessarily linked to larger linguistic communities.

According to the findings, both parents and children in the study were aware of the dual status of heritage language apps, as tools for learning, and for entertainment. By extension, children made comments which showed them as either language learners or players. Foreign language learning apps in the heritage language, while they may meet parental ‘learning’ requirements, were incongruous with children's self-perceptions of themselves as having an identity as a heritage language speaker.

The notion of ‘proper German children’ in particular indicates a need to further explore how heritage language children view themselves, others, and their cultural identity.

Conclusion

This study demonstrates that families’ use of digital technologies to support the heritage language depends on three complex, interacting variables:

- Availability of resources and technical ‘know how’
- Attitudes of parent and child towards heritage language
- Attitudes of parent and child towards online games and apps

These variables are flexible and adaptive, based on attitude, understanding, knowledge and skills. For most children within this study, parents function as gatekeepers, providing access to hardware (tablet, computer, iPad) and facilitating access to software via researching and purchasing suitable apps. Parental attitude towards screen time, and ability to navigate app stores (including in other languages) are potentially vital enablers of heritage language and literacy development. Heritage language learners effectively fall between two stools, having different needs to both foreign language learners and native speakers (Baker 2011). Therefore, while there may not be ‘an app for that’ – or rather, them – it is important to enable families to make the best of what is available.

With schools becoming ever more diverse and multilingual, teachers both in formal education contexts, and in complementary schools, have the opportunity to open dialogues with parents to facilitate a funds of knowledge (Gonzalez, Moll and Amanti

2005) exchange between home and school, sharing good practice, or celebrating heritage language learning in school (e.g. through a notice board, via parental newsletters, etc.), to make children's heritage language identity more relevant in the out-of-home context. Schools and teachers may also be able to assist parents in overcoming some technical difficulties, such as facilitating discussion among parent groups, or sharing technical knowledge needed to access apps and games in other languages. Further research is needed to fully understand the complex relationship between children's knowledge of the heritage language and identity, mirrored in their attitude the games and apps they prefer.

The view that games are equal to "screen time", and inherently passive, while books are for sharing, will need to be challenged and developed. By treating apps and games as a shared resource, something to be experienced and enjoyed together, parents not only enter the child's realm of engagement and their funds of knowledge (Gonzalez, Moll and Amanti, 2005), but also enable access to higher language-level games and apps, potentially enabling children to bridge the gap between "language learner" and "player", helping them to advance along the continuum of language ability, and thus facilitating a higher level of self-efficacy (Ryan and Deci, 2017), and increased acknowledgement of adopting a multilingual, multicultural identity.

Limitations

This study makes the point that all heritage language families are different, therefore, results should not be homogenised or regarded as being universally applicable. Nevertheless, the key findings presented here were representative across the sample, families were, as a matter of fact, similar in their uniqueness. Conducting the research in

English undoubtedly led to the exclusion of many voices worth listening to, furthermore, it needs to be acknowledged that an outsider researcher will not be able to fully understand family relationships, and their evolution, within the space of a questionnaire and interview. More in-depth research is needed with specific communities, to enhance knowledge and understanding of the issues raised in specific contexts.

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