Ownschooling:

The Use of Technology in 10 Unschooling Families

by

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ABSTRACT

Unschooling is a child-centered educational philosophy that eschews teachers, schools, curricula, grades and tests. Unschool practitioners have complete freedom to choose what they want to learn, when, to what level, and for how long. Unschooling families use the World Wide Web to provide a bespoke academic experience at home. This study compares qualitative data collected from questionnaires and semi-structured interviews conducted with 10 unschooling families with quantitative data collected from 5 children within these families using a tracking and monitoring software. The software captured the duration of use, keystrokes, mouseclicks, and screenshots for all programs and websites for 14 days. Children stated they used technology less than 6 hours a day, and parents stated children used them less than 8 hours a day. Quantitative data shows the children use technology at least 10 hours a day, suggesting usage self-reports may not be reliable. The study revealed hardware form factor was the number one determinate of application use. Almost exclusively social media was used on smartphones, internet browsing on tablets, and creative endeavors such as modding, hacking, fan fiction writing, and video game level building all took place exclusively on laptops and desktops. Concurrent use of differing hardware form factors was the norm observed. Participants stated YouTube, Wikipedia and Khan Academy were the websites most used for knowledge gathering. The tracking software verified YouTube and Wikipedia were the most used websites, however when accessed on the PC, those sites were used almost exclusively for video game related purposes. Over 90% of the total PC use was spent on video games. More traditional educational activities were done primarily on tablets and

on parent smartphones with parental engagement. Khan Academy was not used by

participants in the 14 day monitoring period. 90 day web browser logs indicated Khan

Academy was used by individuals no more than 3 times in a 90 day period,

demonstrating the inherent risks in relying upon internet usage self-reports without

quantitative software for verification. Unschooling children spent between 30 and 60

hours a week using technology.

To my parents, thank you both so much for everything you have done in my life. Words are not enough to thank you both for your unwavering support and encouragement during my journeys.

Above all, thank you to my family! To Brock and Drake, the best sons a dad could ever imagine! Thank you both for all of the times you patiently answered question after question, put up with me forever tinkering with your computers, and for your understanding and patience during the long hours it took to analyze, and write, this dissertation. I love you both so much!

And to my wife, Linda, I don't even know where to begin to thank you. You are always there for me, with unwavering belief and support. All I can say is I love you so much and look forward to more adventures!

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CHAPTER 1

INTRODUCTION

Unschooling is an educational ideology founded upon the tenets of "trust children" and "living is learning". Children are encouraged to pursue any interest they may have, to as shallow or deep a level as they like, for as long as they like. Unschooling parents eschew tests, grades, curricula and teachers, believing the education system does not properly leverage the innate curiosity of children. To unschoolers, the system inadvertently damages children by affixing them with labels, constant judgment and, by ignoring their personal educational desires delegitimizes their agency. Further, the decontextualized nature of academic content, assessed via methodologies celebrating rote regurgitation of facts, to unschooling parents is inferior to contextualized, *in situ*, learning that occurs naturally while pursuing one's interests. Unschooling parents believe today's educational system, by placing conformity to curriculum and standards ahead of individuals' interests, is designed to create employees and consumers. To unschooling parents public education is not a place a child attends to learn but rather attends to be molded for future employment.

Unschooling parents are not against education, quite the opposite as they, by way of acting as mentors, guides, and, dare I suggest it, teachers, provide their children rich, uninterrupted opportunities to pursue interests. They are against formal, organized educational vehicles that require limits and restraints on children's knowledge pursuits. They replace today's almost 150 year old compulsory public education system with real-life experiences and technology, relying upon the internet, software and portable

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hardware to augment learners' curiosities. Though the importance of technology to unschooling families is often cited in the literature, websites and blogs, until this study there has been no objective data documenting exactly how technology was used. This study provides specific data on hardware form factors used, software packages deployed, and internet browsing behavior. It identifies shared family characteristics that make unschoolers a community of practice, and it proposes a new term, ownschool, to describe the philosophy of unschoolers and liberal homeschoolers, that of "owning" ones "own" education.

Unschooling was created in the 1960s by John Holt as a response to shortcomings he observed within the public school system. As an educational practice it was, at best, perceived as a novelty form of homeschooling possessing, at most, a few thousand practitioners in the United States for its first two decades of existence. Unschooling has experienced prodigious growth in the last 20 years though, not coincidentally during a time in which specialized information, once the purview of specialists only, has become available to anyone with an internet connection (Stevens, 2001; Panettieri, 2006). Unschooling families today rely upon technology to empower their children to pursue their interests, no matter how obscure. Websites such as YouTube and Wikipedia provide countless hours of videos, text and hyperlinks to even more specialized websites on nearly any topic that can be imagined. Interaction with people of similar interests comes from forums, groups, Meet-ups, and even emailing, IMing and/or Skyping directly with experts on particular topic leads. On the internet one, regardless of age, can become a recognized expert on a topic. Websites such as Khan Academy provide quality

teaching modules on math, science, arts and humanities while Coursera and other

Massive Open Online Courses (MOOCs) offer free educational content online. Berkeley,

MIT, Stanford, Yale, and other universities now offer free online classes. As

unschooling families are often on the cutting edge of the use of technology in education

(Ray 1997; Andrade 2008; Hinton 2012) the families are poised to take advantage of

these free resources. The children in the families are technologically proficient from a

young age. The children in this study more so than most as their parents all work as

experts in the field of Information Technology (IT). The children, digital natives by any

definition used, have grown up knowing only Internet Protocol (IP) addressable devices.

They have been able to access the internet from their youngest years to pursue their

interests.

It is likely there are well over 100,000 unschooling children are in the United

States today (Ray, 2014), yet unschooling is amongst the least studied educational

phenomena with less than a half dozen peer reviewed publications having been published

that address some aspect of it directly. Unschoolers generally desire to stay "off the

radar" as they are wary of local officials for, despite its legality, not all local government

agents understand homeschooling laws which can cause unwanted difficulties (Hill,

2000; Lines 2000; Gaither 2008). The typical unschooling family is not looking to win

converts or recruit new members, in fact many when asked simply say they are

homeschoolers. Unschooling parents, as a rule, steadfastly refuse to allow their children

to be tested, graded or judged, such actions (which often are part of traditional research

methodologies) are anathema to unschooling parents' beliefs that testing leads to

impingement of their child's agency and can harm their self-esteem by needlessly

applying labels. Unschooling parents believe different aspects of a child develop at

different rates. Ontogeny results in some children being at 6th grade reading and 3rd grade

math at age 10 while another child may be reversed but that, over time, all children end

up at a similar place. They believe today's society focuses too much on standards and

development schedules that do not take the uniqueness of each individual into account.

The low number of unschooling practitioners, when compared with 2 million

homeschoolers and nearly 60 million public school children, and their reticence to

traditional testing and measuring methodologies has certainly hampered unschool studies.

Work that has been done previously appears in unpublished doctoral dissertations

focusing on unschoolers demographics and shared traits (Grunzke, 2010; Finch, 2012),

hidden curriculum (Hinton 2012), and agency (von Duyke 2013). Gray & Riley (2013)

published an article on the success of unschooling adults. These studies all noted a heavy

use of technology by unschooling families, typically without restrictions or limitations.

Exactly how this technology was used, what websites were visited, what software was

deployed, what hardware form factors were used, were not documented in any detail.

This study asks a broad question, "*How is technology used by unschooling

children?*" Herein I detail what websites were visited, software used, and how hardware

was used, especially with regard to form factor differentiation. Children and adults were

given a questionnaire and the entire family participated in a semi-structured interview.

Their answers were compared to previous studies and, critically, to the results delivered

by Verity™, a tracking and monitoring software. Verity captured actual computer use

details, including number of keystrokes, mouseclicks, and time spent on each website and application, providing for the first time actual details on unschooling children's use of technology.

Unschooling

Unschooling, as used throughout this study, refers to an educational philosophy of child driven learning. Children's interests guide the direction of learning, and learning is defined as exploring a topic to the satisfaction of the child. Learning is believed to be taking place with every experience. To unschoolers living learning and all experiences result in education happening. Unschoolers believe learning is best done while experiencing the world and that learners learn best what they enjoy. Unschooling families keep their children out of schools with their curricula, tests, labels and judgments. If a child wants to attend a school, take a test, and participate in the public school experience a child is welcome to do so. As such some unschooling families have children who attend college classes, typically at non-standard ages. One participant in this study began taking classes at Mesa Community College at age 10, another entered Arizona State University at age 18 with enough credit hours to be considered a Junior. Homeschool enrichment programs, such as that offered by Eagleridge, provide interested children with a school-like experience once to twice a week. Community centers are used for their organized sports, music, arts and crafts classes. Some unschoolers utilize most, or all, of these structured offerings. They are still considered unschoolers, despite curricula, testing, grading, being involved in the college courses and some enrichment

programs, because the nature of the learning is driven by the child's interest. A grade is never an outcome that is discussed, and completion of a course is not required.

Unschoolers share a common belief that education shouldn't automatically become the purview of the State at age 5. Many children are reading and engaging in basic math skills before they turn 5 years old. Unschoolers challenge the belief that a professional, typically a complete stranger, should be given their child for up to 7 hours a day, in classrooms with student/teacher ratios of up to 40+:1, for the stated purpose of "teaching" them. Unschooling parents believe since their children were learning before they attended school they will keep learning if they are not interfered with them (Holt 1982, 1983).

Unschoolers can be viewed as an affinity group in the sense of Gee (2004) and as a community of practice (Lave & Wenger, 1991). They share a specific way of talking, behaving and interacting that marks individuals as part of the unschooling community. New unschooling parents learn the way of unschooling from veterans practitioners. Park days and other face-to-face provide important avenues of information sharing. Online websites, blogs, chat rooms, and listservs are used to share information (Finch, 2012). New unschoolers learn the literature, beliefs and practices from unschooling veterans. The internet allows unschoolers nationwide to maintain similar practices and philosophies despite vast distances. Unschooling families, particularly mothers, self-publish books about their experiences. They provide numerous anecdotes derived from their own lives as well as those of park day group participants of children learning best by doing. Unschooling parents emphasize the importance of children engaging in authentic

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activities. They want their children to participate in meaningful experiences. For example, they'd rather have their child help build a chair than simply have their child watch it being built (Martin, 2009).

Differences of Unschooling and Homeschooling

Unschoolers differ from homeschoolers in that the latter utilize some form of a curriculum for instruction. A continuum exists among homeschoolers (Figure 1). Those on the far right side of the diagram literally practice school-at-home, replete with chalk/white boards, homework, assigned readings, worksheets and exams. Those on the left side of the homeschooling circle use curricula as but a guide. They allow their children to lead the education at home, to select the books they read and how assignments are to be carried out. Homeschoolers typically ascribe to some form of religion, usually Christian based, while unschoolers rarely possess organized religious memberships (Kirschner, 2008, see Hinton, 2012 for a counter-example).

Continuum

Radical Unschooling

Unschooling

Semi-structured Unschooling

Relaxed Homeschooling

Homeschooling
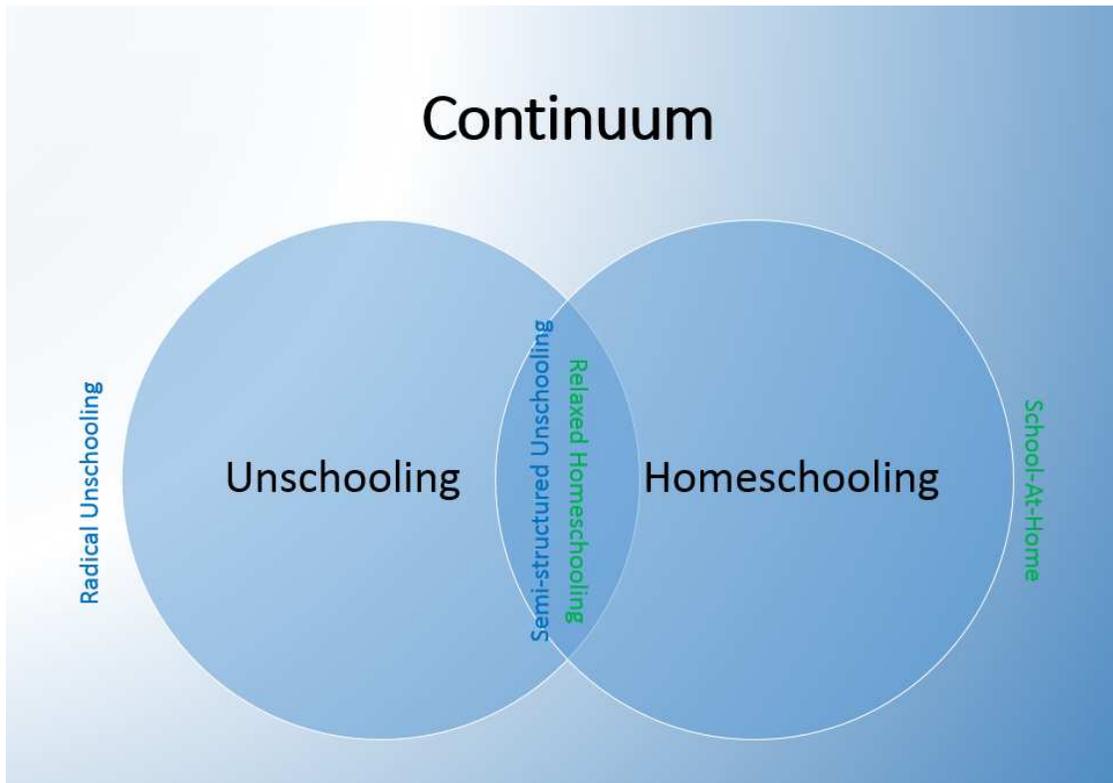
School-At-Home

Figure 1. Education at home continuum

Unschooled families also occupy a continuum (Figure 1). Those on the far left side of the circle are known as radical unschoolers. They profess their children have no rules, no boundaries, and no edicts imposed upon them. Those on the right side of the unschooling circle resemble liberal homeschoolers in that parents may require their children demonstrate knowledge of a specific subject, most commonly math, by using math modules from Khan Academy or a math curriculum that tests their children's mathematical knowledge.

Homeschooling laws are left for each state to decide as there is no Federal education law in place (Lines, 2003). Homeschooling was illegal in 48 states until the

1970s, when John Holt began asking politicking for homeschool legality. It wasn't until 1993 that the last state, Michigan, made homeschooling legal.

In all states there is no legal differentiation between homeschooling and unschooling. Some states mandate some form of curriculum be followed stringently with standardized tests being regularly taken. Others require annual meetings with a local government official where a portfolio of the child's work is presented (Kirschner, 2008, provides a detailed example of such an event). Others possess minimal requirements. For example, in Arizona, the only legal requirement to school one's child at home is the notarization of a document (Figure 2) stating a parent agrees to educate their child.

AFFIDAVIT OF INTENT TO HOMESCHOOL
Send the notarized original document to your County School Superintendent. Keep a copy for your records.

A.R.S. §15-802 defines a homeschool as "a non-public school conducted primarily by the parent or guardian, or non-public instruction provided in the child's home."

Please do not file an Affidavit of Intent to Homeschool for your child if he/she is enrolled in a virtual charter school/public-school-at-home program or has an Empowerment Scholarship Account (ESA) contract with the State of Arizona.

STUDENT INFORMATION
Last Name: _____ First Name: _____ Middle Name: _____

Date of Birth: _____ (Proof of birth is required according to A.R.S. §15-828. See below)

Address: _____

City: _____, AZ Zip Code: _____

Phone: _____

PARENT/GUARDIAN INFORMATION
Last Name: _____ First Name: _____ Middle Name: _____

Last Name: _____ First Name: _____ Middle Name: _____

☐ My child is not yet eight years of age and I elect not to begin formal education at this time.

PROOF OF BIRTH
Please include a certified copy (not a photocopy) of your child's birth certificate or other acceptable proof of birth as outlined in Arizona Revised Statutes §15-828.

PRIVACY NOTICE
The undersigned expressly prohibits the release of any and all information contained in this form including directory information as defined in 20 U.S.C. §1232g (a)(5)(A), without prior written consent by the undersigned. See 20 U.S.C. §1232g (a)(5)(B) and ARS §15-141.

Under penalty of law, I attest the information provided on this form is true to the best of my knowledge.

PARENT/GUARDIAN SIGNATURE _____

Subscribed and sworn before me this _____ day of _____, 20_____

NOTARY SEAL

by _____ Commission expires: _____
       NOTARY PUBLIC

Figure 2. Arizona affidavit of intent to homeschool

States vary on how diligently they capture their homeschooling population as many states do not require formally registering a child as homeschooled. No state makes a delineation between homeschooled and unschooled children. Often unschooling families tell people, especially government officials, that they homeschool their children. Kirschner (2008) argues this explanation makes for easier interaction with government employees.

Unschooling Growth

From 1999 to 2007, while the total number of students enrolled in K-12 increased but 2%, the homeschool population increased 77%, from 850,000 to over 1.5 million students (NCES, 2008). In 2010 the homeschool population eclipsed 2 million students and represented fully 4% of the K-12 population (Ray, 2011).

Unschoolers continue to be counted as part of the homeschooling community on all government surveys. This subsumption makes it impossible to know how many families actually unschool. Farenga (in Clayton, 2006) speculated approximately 100,000 unschooled children were in the U.S. in 2006, up from 2,000 in 1986. In the unpublished Master's thesis of Dedeaux (2012), she noted that 54% of her 1052 survey respondents considered themselves unschoolers, a number vastly greater than any percentage discussed elsewhere in the literature (Clayton, 2006; Ray, 2012; Hinton, 2012; Finch, 2013) and one that merits future research. This makes unschoolers .2% of the entire student population and only 7% of the homeschooling population. Using Farenga's 2006 numbers would mean the unschooled population experienced a 4,900% growth in the last 20 years. Dedeaux's research suggests this growth is likely lower than

reality. Both homeschool and unschool populations show no sign of slowing down their

meteoric growth (Ray, 2013), especially as the wave of legally homeschooled children

enter their family building years. A Google Adwords trend analysis of the terms

"unschool" and "unschooling" from October 2012 through Sept 2014 (Figure 3) shows

searches are relatively flat since 2012. They reflect an increase in searches before the

beginning (green) and end (blue) of the traditional school year.
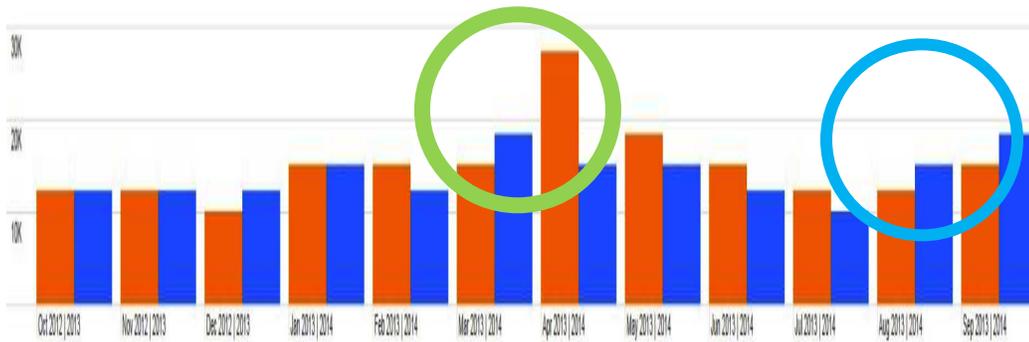
Figure 3. Google Adword results for "unschool" and "unschooling" Sep 2012-Aug 2014

Internet and Technology Growth

The increase of homeschoolers and unschoolers in the last two decades parallels

the growth of the internet. In June, 1993 there was a total of 130 websites available to

visit (Figure 4). A person could, on a then state-of-the-art 14.4kb modem, surf the

entirety of the web over the course of a long evening. At the close of 2012 there were

186 million active websites (Netcraft). By the end of 2013, over 1 billion websites had

been created.

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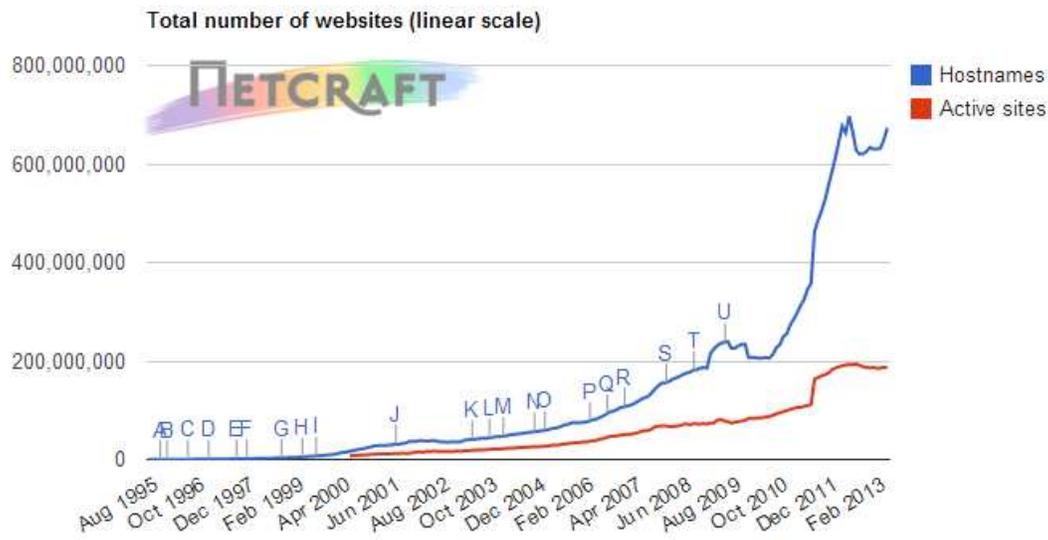
Figure 4. Number of websites created 1995-2013 (from

http://news.netcraft.com/archives/category/most-popular/page/2/, used with permission)

In June, 1995, only 14% of U.S. adults were online, perusing 23,500 websites (Pew, 2013). By June, 2000, 50% of adults were browsing over 17 million websites and, in 2011, 78% of adults, and 95% of teenagers, were actively pouring over 555 million websites (Pew, 2013). Today nearly 100% of teenagers, and over 90% of adults, access the internet (Madden, Lenhart, Duggan, Cortesi & Gass, 2013).

AltaVista, Yahoo and Google made searching websites progressively easier. Giving the engines something to search were companies such GeoCities, Go Daddy, and Wikipedia. As time went on, millions upon millions of individuals began building their own websites and blogs to discuss and share their interests. Today it seems every youth has a Facebook, Pinterest and Instagram account, with ever more content creators desiring to share their interests with the world. These creations cover essentially any

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subject imaginable, and it is in this realm of near real-time information that unschooling children explore.

The exponential growth of the internet was made possible by the truth of Moore's law which states the number of transistors on integrated circuits doubles every two years (Moore, 1965). This phenomenon means hardware becomes more powerful at dizzying speeds, so much so that the old adage is true in a strict sense: A smartphone of today does possess more computing power than all of NASA had at its disposal during the lunar landings. Today's tablets have, in their single processor, as much computing power as a late 1990s government supercomputer that occupied multiple rooms. Obsolescence, a side effect of Moore's law, means ever falling price points make sophisticated technology available for nearly everyone.

Teen smartphone ownership exceeded 70% in Q3 of 2013 (Nielsen, 2013). Smartphones can now access the entirety of the World Wide. In 2013, tablet ownership approached 50% in adults 25-44, the age group with the most school aged children and, in a recent survey 20% of tablet owners routinely permitted their young children to use them (Pew, 2013). Additionally, 80% of US homes in 2010 had ready internet access (Pew, 2013). With businesses such as hotels, Starbucks and McDonalds offering free Wi-Fi to lure customers, the ability to access the internet, even while traveling, is essentially ubiquitous.

Families today have faster access to more information than any group in history. A Google search has become the first step when seeking answers to any question. With powerful portable devices and pervasive high speed internet always at the ready, the

possibility to learn exists essentially anywhere at any time. For unschoolers, such technology offers the freedom to practice their educational philosophy anywhere. Children can pursue their interests in the car, outside, or at home with ease. Sites such as Wikipedia, YouTube, and Khan Academy provide specific answers within seconds to countless questions. Unschooling parents believe technology replaces rote memorization and believe it is more important that their children learn to think, to process data, rather than simply memorize it.

Purpose of the Study

The goal of my research was to discern how unschooling children use technology. 10 unschooling families participated in questionnaires and semi-structured interviews that resulted in a subjective, self-reported view of technology use. Verity, a monitoring and tracking software, captured 5 children's actual PC use by tracking actual software used and websites visited plus the number of keystrokes, mouseclicks and time spent in each application.

Research Questions

During the study one overarching question was kept in mind:

1. How is technology used by unschooling children? Specifically, what websites and software were used, and for how long? What hardware form factors were used, and what tasks were performed on each form factor?

I also wanted to know:

2. What kind of technology use restrictions were in place?
3. What kind of monitoring was done, and at what ages did children receive access to technology?

4. When did unschoolers receive their own, personal, technological devices and why were those decisions made?

Methods Note

For full disclosure, my family is a full-fledged member of the unschooling community, attending park days, group gatherings and unschooling conferences. My position as a member of the unschooling community afforded me unprecedented access. It also provided me a lens with which to understand study participant answers, explanations and experiences.

Significance

This research provides, for the first time, actual data of how unschoolers spend their time on computers. The traditional qualitative answers provided from questionnaires and interviews is compared with objective tracking software data, providing a unique opportunity to understand the perception of how computers are being used versus their actual use. The study also reveals the nuanced way in which different hardware form factors are intentionally used. The methodology employed herein should serve as a roadmap for future research that directly captures actual uses of internet-capable technology.

The demographic information on the 10 unschooling families in my study increases to 27 the total number of unschooling families in the literature with demographic data. The findings herein corroborate the characters identified by previous researchers (Kirschner, 2008; Hinton, 2012; Finch, 2013) that make unschoolers a

community of practice. It also suggests that families with similar characters may benefit

from learning more about unschooling.

CHAPTER 2

REVIEW OF LITERATURE

In this chapter I present a history of unschooling and discuss its major

contributors. I discuss controversies of child-centered versus teacher-centered education

and its relevance to the unschooling movement. A discussion of unschoolers as a

community of practice ensues wherein I list criteria that the community shares in

common.

Unschooling and John Holt

Unschooling as a term first appeared in *Growing Without Schooling*, a magazine

Holt self-published, and was used to mean a way of learning that did not involve school.

Holt formally defined unschooling (Holt, 1977):

> "GWS [Growing Without Schooling] will say "unschooling" when we mean
>
> taking children out of school, and "deschooling" when we mean changing the
>
> laws to make schools non-compulsory and to take away from them their power to
>
> grade, rank, and label people, i.e., to make lasting, official, public judgments
>
> about them".

Though Holt used the term homeschooling interchangeably with unschooling in

his GWS writings and in his popular book *Never Too Late* (1979), practitioners gravitated

towards the term unschooling when speaking among themselves or when they desired to

delineate their practice versus homeschooling (Farenga 1999). Holt wrote in the index of

his unschool handbook, *Teach Your Own* (1981), "Unschooling: see Home Schooling"

for by then Holt had decided homeschooling was a "…more generally understood term

for learning without going to school" (Farenga, 2013) and thus began using

homeschooling in place of unschooling in his writings.

Holt and Farenga (2003) provide this lengthy definition of unschooling:

"This is also known as interest driven, child-led, natural, organic, eclectic,

or self-directed learning. Lately, the term "unschooling" has come to be associated

with the type of homeschooling that doesn't use a fixed curriculum. When

pressed, I define unschooling as allowing children as much freedom to learn in the

world, as their parents can comfortably bear. The advantage of this method is that

it doesn't require you, the parent, to become someone else—a professional teacher

pouring knowledge into child-vessels on a planned basis. Instead you live and

learn together, pursuing questions and interests as they arise and using

conventional schooling on an "on demand" basis, if at all. This is the way we

learn before going to school and the way we learn when we leave school and enter

the world of work. So, for instance, a young child's interest in hot rods can lead

him to a study of how the engine works (science), how and when the car was built

(history and business), who built and designed the car (biography), etc. Certainly

these interests can lead to reading texts, taking courses, or doing projects, but the

important difference is that these activities were chosen and engaged in freely by

the learner. They were not dictated to the learner through curricular mandate to be

done at a specific time and place, though parents with a more hands-on approach

to unschooling certainly can influence and guide their children's choices."

Holt and Farenga (2003) continue with their definition:

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"Unschooling, for lack of a better term (until people start to accept living as part and parcel of learning), is the natural way to learn. However, this does not mean unschoolers do not take traditional classes or use curricular materials when the student, or parents and children together, decide that this is how they want to do it. Learning to read or do quadratic equations are not "natural" processes, but unschoolers nonetheless learn them when it makes sense to them to do so, not because they have reached a certain age or are compelled to do so by arbitrary authority. Therefore it isn't unusual to find unschoolers who are barely eight-years-old studying astronomy or who are ten-years-old and just learning to read."

Despite Holt and Farenga's (2006) lengthy definition there is no one accepted meaning of "unschool" amongst the unschooling community. Free range learning, life learning, free schools, democratic schools, radical unschooling, eclectic unschooling and other terms are used to identify nuances to that particular unschooling practitioner's philosophy. For example, radical unschooling provides essentially zero structure, adult intervention is only provided when asked for (Dodd, 2008; Martin, 2009) while eclectic learning allows for more parental involvement. Unschool is not an ideal term for describing such ideology as it does not capture the unifying thread that all of its practitioners own their own education. "Un" often has a negative quality to it, such as having to "unlearn" something or "undo" something, these are not actions positively associated with learning. I propose a new term, ownschool, to emphasize the importance this educational philosophy places on owning one's own education and taking full responsibility for owning what goes into it.

John Holt was a passionate believer in child-led, trust-laden, curriculum-free learning. He believed children should be allowed to pursue their interests rather than have learning dictated by adults. He believed children had rights, a voice that should be heard, and opinions to be counted (Holt, 1981). Holt believed life was learning, that one shouldn't separate the two, and that all children are born curious. He used the term "unschool" to encourage people to not think of schools at all, to disentangle schools as equating to educating children. Over time the term has become associated with Holt's educational philosophy as a whole and used to differentiate it from curriculum based homeschooling.

Holt's first book, *How Children Fail* (Holt, 1964), was written as a response to his observations while teaching 5th grade from 1953-1963. Holt's early books focused on how schools were harming children and he offered suggestions on ways schools could be changed to reduce harm and take advantage of children's innate desire and ability to learn. He documented examples of how the school system, over time, broke children and bent them to the system's will, quite needlessly in his mind. *How Children Learn* (Holt, 1967), his second book, provided numerous examples of the innate curiosity of children. He detailed observations of how children are naturally curious and learn amazing things when interested. By 1977, he had decided schools couldn't be fixed (Holt, 1977b). He had spent nearly a decade trying to make changes and realized the system was too big, too entrenched, for him to make any nationwide changes. In *Teach Your Own* (Holt, 1981) he dedicates many chapters to the legal aspects of unschooling, chapters today that demonstrate the serious risks parents in the 1970s ran when home educating their

children. Parents had essentially no rights to determine how their children were educated, the state's compulsory schooling laws were inviolate. Violations could result in fines and arrests for truancy and delinquency.

Holt is the founding father of unschooling but, having written in times before computers were prevalent, he wrote almost nothing about them. He did express concern over children spending too much time watching television (Holt, 1981), he preferred children spend their time outdoors exploring or reading books. Holt's philosophies and beliefs on children are wholeheartedly embraced by the unschooling community and one would be hard-pressed to find an unschooling family where at least one parent had not read some of Holt's popular works.

Farenga (1999) writes, "But it was Ivan Illich's *Deschooling Society* (1971) that most influenced Holt." Farenga goes on to explain that Holt and Illich began corresponding "at length" and it was at this time that Holt's ideas shifted towards what would become unschooling, completely removing children from the school system. Before Illich Holt had written of making changes within the school system, after *Deschooling Society* (1971) he no longer writes of such illusions.

Ivan Illich

Deschooling Society, by Ivan Illich (1971), calls for the removal of the current education system, to literally "de-school" or remove schools from society. Illich provides examples of how the U.S. system of education creates a country of consumers that keeps the economic engine running. Illich alleges the U.S. has exported this system across the

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world, a system that is unsustainable to the planet's resources, one that creates far more problems than it solves, and one that must be changed.

John Taylor Gatto

John Taylor Gatto is the second most quoted and referenced author of unschooling content by parents in the study. Gatto spent over 40 years teaching in New York public schools and is embraced as a hero in the unschooling community for his New York State Teacher of the Year acceptance speech, one where he carefully described 8 "pathologies" school causes children (Gatto, 1990). Gatto's *Underground History of American Education* (Gatto, 2000) is a highly detailed treatise on how the U.S. school system came to be what it is today, replete with Senate Subcommittee notes from the 1800s documenting the collusion of government and corporations to create a reliable labor pool. He describes the shift from a fully literate society to one that, because of the need of laborers by the Carnegie, Rockefeller and other "robber barons" of the day, shifts to one of the Prussian system of education where children are taken at a young age and forged to be something needed by "society" which, according to Gatto, was the needs of industrialists. Whilst Holt wrote of children's innate curiosity and their ability, and desire, to learn and gave parents confidence that if they unschool their children, they will absolutely learn effortlessly. Gatto writes with much vitriol about the horrors of schooling. Gatto's works serve as a dark yang to Holt's light yin on children in public schools. Gatto's succinct works, *Dumbing us Down* (Gatto, 1992) and *Weapons of Mass Instruction* (Gatto, 2010), are often referenced by unschooling families in conversations

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with newcomers. Gatto repeatedly expresses his disdain for modern technology, especially computers (Gatto, 1990, 2010). Gatto believes, like Holt, that children should be playing, they should be outdoors experiencing life, and they should most certainly not be staring, hours on end, at screens.

During interviews I would bring up Holt and Gatto's stances on technology. The parents believed that both authors are products of a generation long gone. Since neither were raised with technology, they simply didn't understand its utility and benefits. The parents believed both authors provided accurate assessments about the damage schools cause to children and that children possess innate curiosity and genetic predispositions for learning. They believed both authors overlooked the many benefits technology provides to today's youth.

<center>**Unschooling Online Resources**</center>

The oldest and longest running unschooling websites are unschooling.com, created in 1998, and naturalchild.org, created in 2000 (Whois.com n.d.). A Google search for "unschool" and "unschooling" produces their Wikipedia pages as the first suggestion, then these two websites appear next on the results. They offer visitors definitions, resources, links, testimonials as well as areas to shop for unschool inspired products. Through these two sites all of the major unschooling blogs and websites can be reached. Parents that discovered unschooling after their children had attended a public school cited the importance of the internet in helping them reach a decision to unschool and that the internet provided support, via forums and blogs, for their endeavor (Grunzke, 2010).

Unschooling parents, primarily mothers, have taken to the internet to share their thoughts and experiences. A Google search September 20th, 2014 revealed the existence of over 50 unschooling blogs. They cover the unschooling spectrum, from radical unschooling websites to those that show how to incorporate some structured learning into the lives of children. All aspects of unschooling were addressed, from lists of resources and ideas for children to objection-handling and overcoming with family, spouses and friends, to various strategies to interact successfully with government agencies. All of the mothers in this study cited their use of internet resources, especially blogs, as a way to share their own experiences and see what others are feeling, thinking and doing. Each family in the study was part of at least two local listservs where they could post, and be alerted to, park days, museum and zoo trips and other opportunities for group socialization. The listservs are crucial links to the community as a whole.

Self-Teaching and Technology

Illich, Holt and Gatto believe children would learn better in a system that doesn't have tests, compulsory attendance, and mandatory subjects that children may not be interested in. They seek a system that gives children freedom to choose what they want to learn and when.

Illich (1971) believed today's system of education was not about learning but about raising a population to be subservient to society. Illich argued the western system of education should be abolished and replaced by a system that allowed people of similar interests to meet and learn from one another. Here is Illich's proposal on how to use technology to create a better learning environ:

"Let me give, as an example of what I mean, a description of how an intellectual match might work in New York City. Each man, at any given moment and at a minimum price, could identify himself to a computer with his address and telephone number, indicating the book, article, film, or recording on which he seeks a partner for discussion. Within days he could receive by mail the list of others who recently had taken the same initiative. This list would enable him by telephone to arrange for a meeting with persons who initially would be known exclusively by the fact that they requested a dialogue about the same subject." (p. 19)

Today's World Wide Web does just this, and does so more economically and faster than anything he imagined. It is the World Wide Web that unschoolers rely upon for answers to their questions and that enables them to freely pursue their interests. I am certain Illich would have loved the internet and would have been an ardent supporter of the home learning movement.

Gatto argues that children learn best that of which they are interested in. He believes schools are incapable to match an individual's ability to learn something they are interested in. Gatto (2000), citing an unnamed IBM vice-president's comment:

"…that in his opinion this country became computer-literate by self-teaching, not through any action of schools. He said 45 million people were comfortable with computers who had learned through dozens of non-systematic strategies, none of them very formal; if schools had pre-empted the right to teach

computer use we would be in a horrible mess right now instead of leading the world in this literacy."

Holt (1981) was a proponent of children being allowed time, and space, to play for themselves:

"What children need is not new and better curricula but *access* [emphasis Holt's] to more and more of the real world; plenty of time and space to think over their experiences, and to use fantasy and play to make meaning out of them; and advice, road maps, guidebooks, to make it easier for them to get where they want to go (not where we think they ought to go), and to find out what they want to find out."

All 3 of these authors advocate the importance and power of self-teaching. Self-teaching and intrinsic motivation are pillars of the unschooling community. Each family provided many examples of how these beliefs were lived by their children.

I have a personal anecdote note I believe accurately captures what unschooling parents desire their children to achieve. I learned to program Basic on a Commodore 64 with no formal instruction. I had the user manual, a few magazines, and lots and lots of trial and error. But it was through that trial and error process that I built a deep understanding of computers. There was no fear of failure, no judging, I simply kept trying until I was able to get the C64 to do what I wanted. When I would get stuck I used my 300 baud modem to access Bulletin Board Sites (BBS) to seek solutions from programmers around the world. My deep interest in programming flourished during the summer of my 7th grade. My parents still tell the stories of my spending nearly the entire summer writing code that made a dinosaur walk across the screen.

In 8th grade I enrolled in a class called Computer Science where I was forced to follow a strict curriculum that did not take my experience, nor my passion to master programming, into account. The teacher-centric approach of the class made sure all children "knew the basics" by the end of the semester but it did not offer any solution to individuals such as myself. Had I not possessed my own computer at home it is quite likely my coding career would have ceased that semester.

In contrast I took 7 years of Spanish (grades 7-12 and 2 semesters in college) in which I was a diligent student earning an 'A' in each class. Yet, despite great grades and much effort, I discovered during a 2 month paleontological expedition in Argentina that I had no conversational Spanish knowledge. Though I knew many vocabulary words I discovered I had only truly learned to read, and speak, in the present tense of the language, thus trying to read or understand anything that involved past tense, future tense, subjunctive, pluperfect, etc. was all but impossible. The first two weeks of the expedition were a sobering reality check for my proud classroom Spanish achievements. How is it I had spent 270 weeks of learning Spanish only to discover I could barely get by? Then I realized 270 weeks, or 1,350 hours, were spent over the course of 7 years, which, in straight math, works out to less than 4 hours a week of "study", and the reality is those hours were focused on memorizing items for a test, not actually practicing the language.

I spent the summer before 8th grade learning Basic programming because I was interested in it. When I took my first formal class I had learned more in those 3 months than the teacher likely knew. It was not until college that I encountered coursework that exceeded my knowledge of programming, for all 4 years high school Computer Science

followed the same format of the 8th grade class and never afforded an allowance to students that strove to overachieve. I was more fluent in my application of the Basic computing language because of pursuing my personal interests than I was in Spanish, despite the many years of Spanish studies. I thought I was deeply interested in both but I now realize I was deeply interested in getting an 'A' in Spanish. Yet, when it came to computers, I was deeply interested in walking dinosaurs across a screen, writing video games, and making the computer do things. Things I wanted it to do.

Unschoolers seek to take advantage of a child's natural curiosity and desire to learn. They believe when a child attains a deep knowledge in one subject the dedication, effort and work habits required to master that subject will transfer to any other subject they seek to learn.

Unschooling and child- and teacher-centric paradigms

The paradigm of student centered learning (SCL) contrasts strongly with compulsory education's traditional teacher centered learning system. SCL is built upon the concept of constructivism where learners actively construct knowledge based upon their own experiences and ideas. The concept that learning takes place within the individual, and that the individual is responsible for the internalization of knowledge has a strong appeal to unschooling sensibilities.

In a teacher-centric model the teacher controls all aspects of learning. They decide what is important to be studied, how the material will be taught, and how it will be assessed. Teacher centric methodologies place all of the power in the hands of the teacher. Teachers then employ a myriad of methodologies to instill in their pupils a

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desire to perform. Doing well on assessments is encouraged via artificial incentives that range from placing importance on gold stars and grades to, in more severe scenarios, coercion, public humiliation and intimidation. The teacher-centric model views children as empty vessels that knowledge is poured into. In today's world of standards and Common Cores, the deciders of the knowledge to be taught are unnamed. A curriculum is adopted by the administrative and political leaders in a state or a district and deployed downward with almost no room for deviation. To unschoolers, this nameless, faceless "they" are anathema to their desires to own their own education.

The teacher-centric methodology has the advantage of being able to proclaim, by way of assessments, that someone has learned a specific content. Teacher-centric methods typically clearly define the goals of a lesson, the material expected to be mastered, and what the assessment protocols will entail. The system enables scaffolding of materials, with lessons often constructed with the presumption that certain content has already been presented, sometimes years prior, and with the knowledge that specific content will be taught in future lessons as long as the curriculum overall is adhered to.

The teacher, viewed as the subject matter expert, teaches the material to the class, regardless of the interests within the room (Huba and Freed, 2000). Teacher-centric methodologies claim to make more difficult subject matter easier to be taught. The children are not given the ability to opt out of a particular concept, no matter how difficult they may perceive it to be. Atomization of material is encouraged within a teacher-centric system as tight chronal control of content delivery means material can be partitioned out over many grades.

Student-centered learning believes individuals construct the knowledge within themselves, using their prior life experiences to make sense of content. In the most pure forms of student-centered learning, the children determine what they will learn in a classroom and how they will be assessed (Weimer, 2002). Teachers position themselves as facilitators and guides who help the children construct the knowledge for themselves rather than as experts.

Controversies abound within the literature over which system provides better learning results. Academics continue to argue over which approach is better, with both sides producing findings supportive of their stance. Some studies have found that student-centered learning is more effective (Khal & Venette, 2010; Polly, Margerison & Piel, 2013; NG & Lai, 2012) at imparting long term knowledge while others suggest teacher-centric approaches produce quicker mastery of difficult material (Harden, Sussette & Dunn, 1984; Bailey & Garrett, 2002).

Teachers find it difficult to actually implement child-centered approaches in the traditional teacher-centric system, for how does one truly assess what a child has learned if that child selected the content and then selected the assessment? The realities of a classroom often result in child-centric work occurring within small groups working together. Children are not left to pursue their own interests on their own.

Unschooling parents oppose teacher-centered approaches to education in any form. Teacher-centric classrooms add enormous amounts of unwarranted stress on children by constantly passing judgment with grades and evaluations, often on content the children have no interest in. Teacher-centric classrooms, by keeping power

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exclusively in the hands of the teacher, undermine fundamental tenets of unschooling, where children have all of the power regarding their education.

Three families in my study had children that attended teacher-centric classrooms for as many as 5 years. These families, when asked to reflect upon the differences of unschooling compared to the public schools their children attended, all stated their children had been living in an educational environment that caused high levels of stress. The stress resulted from never-ending homework assignments and rote memorization of facts their children were not interested in. It stemmed from the panic that ensued when a child missed a week of class because of an illness, as there was no make-up time allotted. In the Librio family, when the first 3 days of the chemistry unit were missed because of illness, if the family hadn't turned to the internet the child would have "been beyond lost". Unfortunately for the child the internet taught him how to complete the assignment, but in a different way than the teacher desired it to be done. This unwillingness to accept other ways of solving problems was often cited by unschooled parents, with and without children who attended schools, as a negative aspect of a teacher-centric system. Many of the fathers in the study are math experts and believe there are many ways a child can learn multiplication. One father, Kevin Monro, produced during our interview sections of the Common Core math curriculum. He railed against its rigidity. To him some modules of the Common Core take what should be a simple math concept and make it all but unintelligible, or at least far more difficult than it needs to be. Unschooling parents are supportive of their children learning and do not mandate they learn information in a specific way.

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Unschooling parents fundamentally agree with the concept of child-centered learning. However, they do not believe a classroom, even one that employs child-centered learning principles, is the optimal place for children to learn. Child-centered classrooms typically have the children work in groups. Unless these groups consist of individuals that are actually pursuing a specific question of their own accord, that they are all pursuing the same question, then a group can prevent children from pursuing the aspects that personally interest them.

Unschooling parents are fully supportive of teachers acting as guides and facilitators to their students. However, they observe that classrooms have between 20 and 40 children on average. In a typical 7 hour day, a teacher has, at optimal efficiency, 420 minutes to spend with the students. If there are 20 children in a class then the teacher can spend 21 minutes per day one on one with a child guiding and facilitating. To unschooling parents 21 minutes a day does not sound like enough time to spend with children, especially considering that number is a hypothetical best case scenario, the reality is far less presuming the teacher is able to spend any one on one time with a child whatsoever.

In child-centered schools testing still occurs. Standardized tests such as Arizona's Instrument to Measure Standards (AIMS) are required at all public schools. Even Eagleridge, the home school enrichment school in Mesa, is required to administer standardized tests and provide grades. Unschool parents believe children in group projects taking place in child-centered classes never truly are allowed to create their own assessments. If the assessment is close to what the teacher desires to see, or the

administration requires, then it will be approved. However, if the assessment is deemed as unreasonable by the teacher it won't be approved. Therefore children, according to unschool parents, operate under the illusion of freewill and agency in a child-centered public school class.

The parents in my study stated they would rather locate a subject matter expert in an area the child is interested in than have their children attend a school, even one with child-centered learning. For example, an unschooled child interested in paleontology will result in the parent, or the child, reaching out to the local paleontologist to see if there are opportunities for the child to learn about paleontology. They ask to volunteer in the lab, attend digs and meet with the paleontologist and the staff. The unschooling parent's desire to facilitate means the parents work hard to help the children attain their interests. Children interested in theater join theater groups, programming join programming clubs, online or in person, and medieval armor interests result in apprenticeship requests to the blacksmiths at the local Renaissance Festival. Children take online and face to face community college classes, or local community center classes, in order to learn about specific topics.

A child-centered classroom is not capable of supporting one of the hallmarks of unschooling, freedom of choice. In unschooling, a child may, a few days into learning about a something, decide it isn't as interesting as they initially believed it to be so they cease pursuing their interest with no penalty. In a child-centered school environ, the child would still be required to complete a project to show knowledge was gained. The teacher in a classroom isn't as nimble as a parent whose child is learning at home.

In this study, unschooling parents were specifically asked to discuss their children's ability to quit. The families all agreed that, before they invest actual money into, say, a tuba interest, they explain that if the child signs up for lessons they are, barring unusual circumstances, committed to honor their sign-up period. If, after a few days, the child no longer wants to play the tuba the parents try to understand the underlying cause. "Too difficult" was not a reason the child can use according to the parents in the study. Yet children are not encouraged to "stick it out" if something is perceived as difficult, especially if the time commitment isn't that long. Unschooling parents desire their children to have grit and resilience. To unschooling parents completing projects in life is important. However, they view their children with the same respect they view themselves, such that if they begin a project and there are compelling reasons to stop the project prematurely, they allow the children to do so.

To unschoolers assessments are artificial. How is "knowing" defined? Does it constitute as knowing if a child memorized the order of the first 10 Presidents of the United States, only to forget them shortly after the test? The 'A' grade would indicate the child knows the Presidents, but, in a retest 5 days later, how likely is it the child will still know the information if the material wasn't interesting or meaningful to the child? Unschooling parents believe grades create an artificial system that creates a false confidence of knowing. Unschooling parents believe areas a child has interests in results in a deeper sense of knowing, one that will stay with the child. A child that likes skeletons will be able to remember the names of the bones long after a child who memorized them only to pass a test will.

Parents expressed concerns with scenarios where a child never shows a deep seated interest in a topic. They wondered aloud about what they would do if their child likes to skim, or sample, different subjects but never wrestles vigorously with content. The veteran unschooling parents offer the following counsel: "don't worry, they'll find something they are interested in." They proceed to give anecdotes of similar situations that their own children, or friends of theirs, were in. Allen Damahat tells of how he worried about his oldest son, Derek, who, at 14, hadn't found a passion yet:

"Out of the blue decided he wanted to join the rowing team. It requires him to be at the lake at 5 am, he hasn't seen 5am accept when he'd stay up all night! He sets his alarm and wakes at 4 am now. He has yet to be late. He loves rowing! He has learned its history, its terminology, and he is now asking if he can build his own skiff. He is already sizing up the materials that it will require."

I heard similar stories of children finding their passion in archery, gymnastics, baseball, horseback riding and any number of other disciplines that, when focused on, allowed the child to learn a vast amount of ancillary knowledge. These anecdotes encourage to a certain extent, however I observed all of the male participants in my study listed "video games" as something they are good at, and enjoy. The mothers of the 10-12 year olds often expressed concerns that their children would only like video games and nothing else. If a child spends 10 hours playing a video game because they are seeking to understand the parameters of a game so they can mod or hack it, or are trying to become a professional gamer, playing for such long periods may make sense. If they are playing without purpose the time spent is arguably not of great benefit. Unschooling parents are

heavily involved in their children's lives and, when they see the children spending a few days, or even weeks, in such a pursuit they engage in an attempt to redirect.

The unschooling parents, by virtue of having a full time, educated, parent at home with full access to the internet, as well as a robust unschooling community, believe they offer a better educational experience than a school. They believe true child-centric learning is the only way to properly educate a human being.

CHAPTER 3

METHODOLOGY

This study was designed to understand how technology is used by unschooling children. In this chapter I describe the design, collection methodologies with a special emphasis on Verity software's deployment, and data analysis.

Research Question

"How is technology used by unschooling children?" was the central question asked in this study. Technology was defined as any electronic device possessing an IP address. Use data derived from four sources, 1. a questionnaire, 2. semi-structured interview, 3. web browser logs and 4. Verity tracking software. The study strove to provide the first comprehensive look at how unschoolers incorporate technology in their "living is learning" educational paradigm.

Research Design

Qualitative research methodologies of questionnaires, semi-structured interviews and case studies were employed (Altheide and Johnson, 1994; Denzin and Lincoln, 1994; Strauss and Corbin, 1990). The questionnaire asked participants for demographic information and to describe what technology the children owned and had access to. The semi-structured interviews allowed family members to expound upon their questionnaire answers. To facilitate comparisons of this study's unschooling families with those in the literature the interviews included questions designed to address parental educational backgrounds, ideological beliefs about education and receive explicit answers as to why

the parents selected unschooling. This information was used to identify commonalities between the individual families.

Verity, a monitoring and tracking software, was installed on select PCs to provide real world PC use data. Verity tracked software used and websites visited for 14 days during which it counted the number of mouseclicks, keystrokes, and time spent on each website. Internet web browser logs were used to provide 90 days of internet usage. The objective data derived from Verity and browser logs was compared to the subjective self-reported data of the questionnaire and interviews. A follow-up interview was held to discuss the variances between the data points, specifically: What applications were actually used and for how long, and what were the primary websites used?

Recruitment

Purposeful selection was utilized when recruiting the 10 family participants (Merriam, 1988). While recruiting I endeavored to incorporate a broad spectrum of socioeconomic, race, and education backgrounds. I attempted to include individuals with varying numbers and ages of children and possessing differing reasons for choosing to unschool. I strove for an equal mix of families whose children had never attended school and those that started traditional schools and then left for unschooling. Ultimately, as will be discussed in the participants section in this chapter, these demographic goals were not met.

All of the participant families in the study came from the Rainbow Rhythm unschooling group, at the time the largest and longest running unschool group in the East Valley of the Phoenix, Arizona Metropolitan area, and to which my family are members.

I asked individuals at park days and group gatherings if they would participate in my study. 6 accepted on my first request while an additional 4 verbally agreed but later decided against participation for a variety of reasons, the most common of which was they were "worried about being hounded by future researchers."

In addition to personally reaching out to individuals I twice posted on the Rainbow Rhythm listserv a call for volunteers. These posts resulted in 3 respondents that I had never met before volunteering to be part of the study. The final participant was the result of a participant family that enjoyed the interview experience and convinced a fellow Rainbow Rhythm family to join the study.

Participants and Settings

The 10 Arizona unschooling families reside in the East Valley of the Greater Phoenix. Families live in Ahwatukee, Apache Junction, Chandler, Gilbert, Mesa, Scottsdale, and Phoenix. Table 1 contains demographic information on the parents.

Table 1 *Occupation and education information on the 10 participant families*

Family	Father Occupation and Educational	Mother Occupation and Education	Number of Children
Andres	IT Technician, HS	Home Based, BA	2
Ball	Financial) BA	IT Marketing, MS	2
Damahat	IT Finance, BA	Home Based, BA	3
Jones	IT Consultant, MS	Home Based, MS	2
Librio	IT Engineer, MS	Teacher, MS	2
Marik	Professor, PhD	Homemaker, BA	3
Monro	IT Management, MS	Home Based, MS	2
McIntosh	IT Management, PhD	Homemaker, BA	2
Redd	IT Engineer, MS	Homemaker, BA	2
Tay	IT Programmer, BA	Homemaker, BA	2

Demographics for the geographic area the participants live in were available from 2010 U.S. Census data, which states the Greater Phoenix area is 57% White, 30% Hispanic, 6% Black, 4% Asian and 3% Native American. The Lumina Foundation reported 86% of the population graduated high school and 37% went on to earn an associate degree or higher, making Phoenix 2% lower than the national average in completed post-high school degrees (Lumina 2010).

The participants in this study do not resemble the area's racial or academic demographics. 18 of the parents were Caucasian and 2 were Asian. 19 of the 20 parents graduated with a bachelor's degree and 11 of the 20 possessed a master's degree or higher.

Hughcalc (http://www.hughcalc.org/midclass.php) defines middle class in Arizona as households with combined annual incomes between $44,266 and $132,800. Using this definition 7 of the 10 families were middle class, with 2 placing on the low end of the range and the remaining 5 earning approximately $100,000 annually. 3 of the families exceeded the middle class threshold. Of note, all of the families in my study have 1 parent home full time, and in all but 1 case that parent is the mother. This contrasts strongly with Pew Research Center's 2012 study that indicates 71% of all mothers in the U.S. work outside the home (Pew 2012).

Not all members of the Rainbow Rhythm unschooling group are members of the middle or upper class financially. As one member explained to me, "There are two kinds of unschoolers, the educated granolas and the hippies". Perhaps a bit of an exaggeration, yet many of the mothers in the study described themselves to me as "granola" and many

of the "hippies" wear that moniker proudly at park days. I asked families of this other socioeconomic unschooling group to participate in the study but none were willing, primarily because of their transiency. One family lives in a converted bus and travels the country following nice weather. Another described themselves as "professional house-sitters" typically following not-so-nice weather. I mention this group for completeness and to state that, though none of them participated in the study, personal observation and discussions with them indicate these children rely upon technology as much as their more geographically stable counterparts. All of the children were observed to have smart phones and the families explained that they preferentially shop at places with free Wi-Fi.

All of the children in the households were unschooled, there were no households where participants had some children in a traditional school while others were unschooled. In 2 of the homes the unschooled children were the "second round" of children by way of marriages and divorces. Both of these families each had 2 prior children that attended, and graduated, in the public K-12 system. 7 of the families had never sent their children to public school. 8 of the 10 families had 2 children, 2 of the families had 3 children. Unlike homeschool families, where research has shown over 50% are religious in nature (Baumann, 2001; Ray, 2005), none of the participants in my study professed any organized religious beliefs.

Interviews took place in my home (3), a library close to the interviewees (2) and in the home of the participant (5). All of the questionnaires were filled out at the same time, none were left behind for individuals that could not attend the meeting.

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Questionnaire Administration

Questionnaires were provided to all family members present at the beginning of the meeting. Questionnaires for the mother and father were the same with the exception of asking if the mothers attended La Leche League (Appendix A). After the respondent had the opportunity to look over the questionnaire I asked them to sign the consent form and then asked them if it was ok if the children could sign a consent form as well. Children were given a questionnaire with different, but overlapping, questions (Appendix B). After completing the questionnaire I reviewed it with the children to answer any questions they may have had. Once they were satisfied with their answers I asked them to sign a consent form.

Upon handing out the questionnaire I advised each participant that all questions were voluntary and that, though I would appreciate each one being answered in full, it absolutely was not required for them to do so, and that they could stop at any time. Additionally I informed each of the children that I did not presume they could read or write and if they would like I would happily read the questions to them and scribe their answers. In 2 cases children requested assistance filling out the written portion of the questionnaire. In both cases their older siblings assisted them. The questionnaires took between 10 and 20 minutes to fill out. Each recipient was asked to fill them out on their own. In the 2 cases where the siblings helped fill out questionnaires, I monitored the answers to ensure the older sibling did not suggest answers to the questions.

The parental questionnaire's first page was designed to capture demographic and historical information. The remaining pages captured the technologic topography of their

household infrastructure and gathered children's usage data. The questionnaire met the "data collection instruments" protocols of Czaja and Blair (1996) and followed closely questionnaire's administered by Andrade (2008) and Hinton (2012).

With the exception of 2 families, all unschooling children in the home participated in the questionnaire. In one family both children opted out of filling out the questionnaire (Redd family), in another (Ball family) the daughter decided she did not want to fill out the questionnaire after she began so I discarded it. In both cases the children participated in the interview and verbally answered many of the questionnaire's questions.

Questionnaires were answered completely in all but 3 cases. In one instance the mother (Marik family) chose not to divulge much of her background information. Two parents (the Damahats) failed to estimate how much time their children spent using technology, though in the interview portion they provided answers. One child wrote "pass" when asked to write down "things you are really good at" (Chris Monro). All other questions on all other questionnaires were answered fully.

<center>**Family Interview Procedures**</center>

Upon collecting the last questionnaire the family interview began. The format was semi-structured with a list of open ended questions that allowed participants time to expand upon their questionnaire answers and to build upon each other's answers. I had 5 questions for the children and 10 for the adults (Appendix C). Due to time constraints in 2 interviews (Redd, Librio) not all of the questions were fully explored. In each meeting I asked the children their questions first. The parents were present in each case. Parents

oftentimes would interject, or even correct, what they believed to be incorrect answers provided by the children. In every case when the children's interview portion was over, the children left the room for some, if not the entire, time of the parental interviews. At the end of the interview I produced the signed consent forms and once more asked if they were comfortable with me using their information. In all cases the participants said "yes".

Verity Setup

At the end of the interview I showed the families examples of Verity's tracking capabilities and asked if they would like to participate in the software tracking portion of the study. 3 families agreed to use Verity for 14 days. In concordance with the terms of the IRB, these families shall remain anonymous. The software was installed on the machine(s) they selected and Verity's username and password were provided to the parents and children so they could remove it at any time. Changes to the default installation included increasing the time Verity kept the data to 30 days from its default of 7 days, screen capture time was set to 30 second intervals from its default of 5 minute intervals, and a pop-up alert requiring the user to click a box that stated the computer was being monitored was set to appear on reboot and upon awakening from being put to sleep or hibernation. For easy retrieval of the data files the default folder that stored the information was moved from C:/User/NCH/Verity/storage to the My Documents folder of the default User id.

Verity Follow-up Interview Procedure

At the end of 14 days the Verity Software trial expired. At this time I returned to the home, retrieved the Verity logs, and discussed the Verity dashboard with the family, showing them how much time was spent per day and where that time was spent. I compared the Verity software usage data to the self-reported questionnaire data and discussed the differences and usage patterns with the children and adults.

Verity Analysis Details and Caveats to Future Research

Like all monitoring software available to researchers today Verity was designed to show users high level details of how a computer was being used. The software has built-in filters that work behind the scenes to create a simplified dashboard. For research purposes these dashboards filter out important data and prevent a highly nuanced usage view. Verity was selected as the software used for this study in large part because it provides the ability to output the raw data as a CSV file which allows the full use of Excel for data interpretation. There are caveats that must be kept in mind when working with raw data and I will discuss these at length in this section for, unless future monitoring software drastically change their monitoring algorithms, the probability of overstating actual use is quite likely to happen when using CSV files. At a high level, software manufacturers continue to create software that, when closed, actually does not fully shut down but rather "shrinks", continuing to run in the background in a low CPU and memory consumptive state. CSV files from Verity count those applications as still in use because, technically, they are.

To determine the software actively being used in a given hour the researcher must filter by Verity's CSV keyboard stroke and mouse click columns where either column is > 0.

Figure 5 illustrates a CSV file interpretation.

Number	Time	Seconds	Keystrokes	Mouseclicks	Application	Caption
2212	18:24:12	20	0	10	Chrome.com	Twitch
2213	18:24:37	10	3	2	Chrome.com	Google Search
2214	18:24:47	44	0	8	Chrome.com	Yahoo
2215	18:25:36	8	0	3	Chrome.com	Yahoo
2216	18:25:44	15	0	2	Chrome.com	Yahoo

Figure 5. Verity CSV file formatted in Excel displaying available data categories

The rectangle in Figure 5 identifies a program that had 10 mouseclicks but no keystrokes. The Seconds column indicates how long that particular program was "pulled forward" or "active". The numbers in Keystrokes and Mouseclicks columns are a running total of actions for a specific application. The Time column is synchronized with the screencapture (discussed below). This allows one to determine exactly what was being observed, in 30 second intervals, on a given screen. In Figure 6 the user has 3 different Yahoo Chrome browsers open. As the subject moved from browser to browser the accumulated seconds and clicks were captured. The Time column in Figure 5 allows

the researcher to see exactly what was being perused by looking at what time a, say, Mouseclick happened and then looking at the corresponding screenshot jpg.

The participants in the study ran Skype continuously in the background, reducing it to an icon in the bottom right corner of their screen. Additionally 3 of the 5 users had Twitch running a large percentage (>50%) of the time on a second monitor. Verity captures screenshots every 30 seconds. In the case of multiple monitors, Verity's screenshots provided snapshots of both screens on a single image (Figure 6).

Figure 6. Skype and Twitch are running concurrently with League of Legends

Figure 6 shows a Twitch stream being played on the left monitor while the right monitor shows the victory screen in a League of Legends game. The right monitor was considered "active" by Verity as it was the one being interacted with via mouseclicks and keystrokes. All keyboard strokes and mouseclicks were attributed to the League of Legend game in the Verity CSV files while it was "active", had the user quickly switched over, via alt-tab or a left-click, to the Twitch screen and then typed or clicked Verity would attribute those keystrokes or mouseclicks to the Twitch software. Verity, in the CSV files, will show capture the Time for Twitch and League of Legends concurrently. This means if a researcher were to simply take the CSV file and pivot the data without first filtering by mouse and keyboard clicks then for any given hour where Twitch was

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streamed for the entire hour on a second monitor and League of Legends was played the entire hour on the primary monitor the time spent using the PC would be logged as 2 hours, not 1 hour. In addition, if the user was running Skype, or any other software in the background, the Skype hours would be counted as well. In a scenario where Twitch and Skype are run the entire time the PC was used the average 12-14 year old participant would be initially found to have used a PC nearly 24 hours a day in an 8 hour usage session. As discussed above, when using CSV files, in order to determine what software Verity considered was active at a given time one must filter by mouseclicks and keystrokes (Figure 5).

Verity captured screenshots every 30 seconds the computer was on, even when not in active use. This resulted in 120 screenshots per hour being generated, or over 1,000 identical screenshots in an 8 hour time period where the user did not use, sleep, hibernate, or power off the computer. Conveniently screenshots of idle computers are the same kilobyte size. In order to determine the last active use of a computer one first filters the folder containing the jpg screenshots by size to identify the approximate time the PC was last used. Once that time is known one then filters the CSV data by keystrokes and/or mouseclick counts at that time. If keystrokes and mouseclicks equal 0 and all subsequent screenshots are of the repeated kilobyte size, then one can be confident no active user activity was transpiring during that time period. There are two caveats to this process. Streaming music sites such as Pandora that are configured to have no display will produce a same-kilobyte-sized pattern yet technically could be considered "in use" if the user was listening to the music to fall asleep. Screen savers with changing images

result in different kilobyte jpg sizes for each image because of how jpgs are processed. In both scenarios a researcher will have to filter where keystrokes=0 and mouseclicks=0 and, in the case of a non-visual streaming application, the researcher will need to determine if such an application had been opened earlier in the logs. In the case of a changing screensaver the researcher will need to examine the screenshots to determine if a screensaver is actually causing the changes. This is readily done with a visual inspection.

<p style="text-align:center">Verity Log Analysis Details</p>

In order to determine what internet sites were accessed I first filtered the CSV files where mouseclicks or keystrokes were > 0. This indicated some kind of activity had been actively initiated by the participant. In situations where a participant was actively watching a Twitch screen Verity listed the initial time and number of clicks used to select the Twitch channel but, once the user began using a browser Verity continued tracking only Twitch's time as all future keystrokes and mousclicks were properly attributed to the now active browser.

To answer the question of what Chrome was being used to search for I filtered by mouseclick/keystroke > 0 and then manually matched the screenshots, by Time, noting what each shot represented (Yahoo news, Wikipedia, YouTube, etc.) in an inserted column 'A' (not shown). Verity provides an Application column that allows sorting and filtering by application type and the Caption field includes the terms searched for in the browser (Figure 7)

Time	Seconds	Keystrokes	Mouseclicks	Application	Caption
10:05:44	20	17	4	chrome.exe	New Tab - Google Chrome
10:06:04	20	6	2	chrome.exe	wiccan wheel of the year story - Google Search - Google Chrome
10:06:24	96	0	17	chrome.exe	Wicca - Wikipedia, the free encyclopedia - Google Chrome
10:08:00	35	0	21	chrome.exe	Kemetism - Wikipedia, the free encyclopedia - Google Chrome
10:08:35	45	0	6	chrome.exe	Pagan religions - Wikipedia, the free encyclopedia - Google Chrome
10:09:20	46	45	25	chrome.exe	Pantheism - Wikipedia, the free encyclopedia - Google Chrome
10:10:06	28	0	21	chrome.exe	Animism - Wikipedia, the free encyclopedia - Google Chrome
10:10:37	126	0	48	chrome.exe	Animism - Wikipedia, the free encyclopedia - Google Chrome
10:12:43	45	0	13	chrome.exe	Panentheism - Wikipedia, the free encyclopedia - Google Chrome
10:13:28	96	0	36	chrome.exe	Polytheism - Wikipedia, the free encyclopedia - Google Chrome
10:15:09	20	0	7	chrome.exe	Nature religion - Wikipedia, the free encyclopedia - Google Chrome
10:15:29	15	0	8	chrome.exe	Ethnic religion - Wikipedia, the free encyclopedia - Google Chrome
10:15:44	25	0	12	chrome.exe	Polytheistic reconstructionism - Wikipedia, the free encyclopedia - Google Chrome
10:16:09	45	16	16	chrome.exe	Syncretism - Wikipedia, the free encyclopedia - Google Chrome
10:16:54	10	0	4	chrome.exe	Neotribalism - Wikipedia, the free encyclopedia - Google Chrome
10:17:04	186	20	65	chrome.exe	Witchcraft (contemporary) - Wikipedia, the free encyclopedia - Google Chrome
10:20:15	10	0	3	chrome.exe	Neoshamanism - Wikipedia, the free encyclopedia - Google Chrome
10:20:25	66	0	22	chrome.exe	Feri Tradition - Wikipedia, the free encyclopedia - Google Chrome
10:21:36	85	0	13	chrome.exe	Feri Tradition - Wikipedia, the free encyclopedia - Google Chrome
10:23:01	16	0	8	chrome.exe	Christianity and Neopaganism - Wikipedia, the free encyclopedia - Google Chrome
10:23:17	15	0	3	chrome.exe	Witchcraft (contemporary) - Wikipedia, the free encyclopedia - Google Chrome
10:23:32	15	0	4	chrome.exe	Cult (religious practice) - Wikipedia, the free encyclopedia - Google Chrome
10:23:52	10	0	2	chrome.exe	League of Legends - Twitch - Google Chrome
10:24:02	218	0	8	chrome.exe	SirhcEz - Twitch - Google Chrome
11:11:17	10	4	4	chrome.exe	YouTube - Google Chrome

Figure 7. Raw CSV file with caption information included

Figure 7 represents the captions for one of the 12-14 year old participants. In this session 24 minutes were spent opening numerous browsers researching various religious terms. The penultimate line reveals the user opened up a Twitch stream and 50 minutes later visited YouTube. The second column, Seconds, indicates the participant spent little time on most pages, however Animism garnered 2 minutes and Witchcraft (contemporary) captured over 3 minutes of the participants time. The reason such little time was spent on each page is, as indicated by the screenshot data, because the user opened the search results into new tabs via the right-click functionality present in all browsers. It is important to be aware of this ability as, according to the participants in the study, many webpages were read over a period of days, typically with Twitch streaming on a second monitor. CSV logs that show a short amount of initial time spent on a webpage does not automatically mean they used it for but a few seconds before moving on. Rather it means that only that much time was spent on its initial opening. The researcher would have to look at the Verity logs for a period of days to determine how

much time was actually spent on a particular page reading it and, even then, if the user opened it on a second monitor and kept the first active but read from the second, there would be no positive way of knowing how much time was actually spent on a page.

The use of time, screenshots, mouseclicks, and keystrokes with application name and caption details allows a timeline of a PC's use to be reconstructed. This permitted me to determine exactly what was done when, and for how long, on a PC (with the aforementioned caveats in mind) for a given time period. Each of the sites in the caption column were then coded. By way of example, on Figure 7 all of the Wikipedia visits were coded as "Wikipedia-religion" with the time summed and recorded as one entry. If the Wikipedia captions involved video games they were coded "Wikipedia-video games". Hacking, modding, Yahoo news, YouTube-uploads, YouTube-entertainment, etc. In cases where software was used the software was listed by its Application name, ex. CheatEngine, Excel, etc. The careful reconstruction of a PC's use allowed me to identify how much time a PC was used for consumption versus creation, and exactly what was being consumed or created at any time, with the caveat being actual time spent reading a given webpage could be higher than what was listed if it was read while some other application was considered active by Verity.

Incognito Mode Information

All users were shown how to use their internet browser in incognito mode in case a parent or other user should want or need to access sensitive information, such as online banking, from their child's computer and not have the activity tracked. Incognito mode prevents Verity from capturing keystroke, mouseclick and time of use information. It

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also prevents the entire session's activity from appearing in the browser's activity log. Verity does, however, continue capturing screenshots but, as Figure 6 demonstrates, the resolution is too poor to display any text typed. Verity participants stated incognito mode was not used during the 14 day period. All Verity screenshot data supports this assertion as they all matched up with CSV file details.

Web browser Log Information

Browser logs allow a view of internet use over a longer period of time than Verity. Chrome was the browser used by all participants in the study. The Chrome browser defaults to maintaining 90 days of browser history unless changed by the user. In no cases had participants altered the 90 day default setting. Browser histories are accessible on any PC by holding CTRL while pressing H. Browser logs provide minimal data when compared to Verity. Figure 8 is an example of a browser log. It provides a timestamp for when a website was initially visited and the site's name but no other data..

Today - Tuesday, October 7, 2014

	4:31 AM		Manage your browsing history - Chrome Help support.google.com	⊡
	4:31 AM		Google Groups productforums.google.com ⊡
	4:31 AM		how long does chrome keep a history by default - Google Search www.google.com ⊡
	4:30 AM		Google www.google.com ⊡
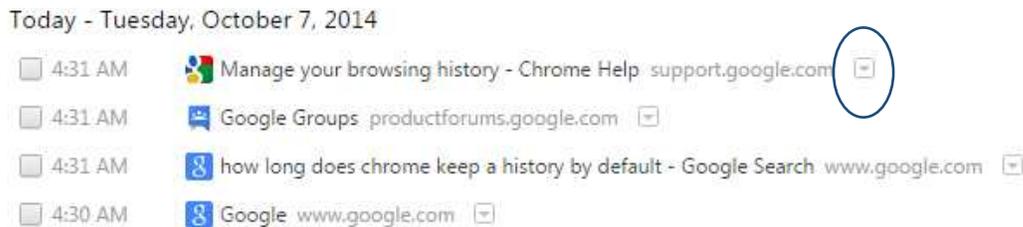
Figure 8. Chrome browser log details

The box circled in blue in Figure 8, when clicked, displays a pop-up with two options. One option states "more from this site". Selecting this options then provides a list, beneath the description, of all of the times that specific website has been accessed in the last 90 days on that computer. The other option allows one to "remove from history". Selecting that option irrevocably removes that specific listing from the browser log.

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Though I have no reason to suspect any of the participants deleted the browser logs the possibility does exist for, outside of computers with Verity software installed where screenshots are kept, there is no way to positively determine if a log's history has been altered. Logs can be erased in their entirety via the "clear browsing data" button, though that action would be obvious as logging resumes immediately from the date a reset occurs.

At the time of this writing, Chrome browser logs are exportable as a CSV file for analysis in Excel. As such each line must be manually entered. CSV files do not capture non-browser applications such as video games that might have been played (unless the games were browser-based Flash games). Despite these caveats and potential risks of missing data browser logs, if believed to be intact, are excellent sources of data on broad internet use for a given machine. The identity of the person that accessed the websites is not knowable, rendering the data of potentially limited value on communal machines. In this study browser logs were used to provide factual evidence that Khan Academy was actually used by participants. During the Verity monitoring period, despite the fact all participants stated Khan Academy was routinely used, Khan Academy did not appear once.

<center>**Assumptions and General Caveats**</center>

Using Verity and browser logs assumes that the user of the PC was the participant that was intended to be monitored. It is possible the PC was used by a friend or a family member, and not the actual participant. Other than asking I have no way of independently verifying if anyone other than the participant used the PC. I asked each

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participant if anyone used the PC other than themselves and all affirmed they were the sole PC user during the Verity monitoring period.

The hours played for a particular game, though accurate, may not be indicative of the typical time a game is normally played. For example, a new game, or an expansion to an existing game, will result in a marked increase in playing time while the new content is enjoyed. This is especially true of games like World of Warcraft where a player achieves a "steady state" of playing time, typically a few nights a week with a guild conducting high level raids a few hours a night. However, upon release of an expansion, players double and triple their normal playing time in a race to reach the new level cap and thereby open up the highest level raids. League of Legends experiences similar spikes in usage when new characters are released as players race to master their nuances.

Such events must be taken into account when studying usage data. Likewise vacations, illnesses, broken machines, new non-PC games entering the house (console, handheld, tablet, smartphone, or board), spring/fall/holiday breaks of their schooled friends, new hobbies, etc., should be accounted for in such studies. In my study none of these events were noted by the participants thus I believe the data herein to be an accurate representation of how the machines were used during the 14 day monitoring. However, a single 2 week snapshot of PC use may not be enough to properly determine actual use patterns over long periods of time thereby limiting my ability to draw grand usage conclusions from my data.

Questionnaire Analysis Process

All interviews were recorded and transcribed to Microsoft Word. Transcripts were printed out and specific quotes were selected and assigned to one or more themes via Excel. Groups of themes were then subdivided into more refined themes. For example, the quote from Petra Marik, "Skype is a big thing in the homeschooling community" was coded as "Technology", "Skype", "Communication", and "Community". Allen Damahat's quote, "When they are using Skype it has to be with people we know who they are" was also coded as "Technology", "Skype", "Communication", and "Community". His quote, "It isn't just memorize, it is memorize and tell me something about it. Since they were interested in Geography we dug into the countries" was coded as "Communication" and "Education". The communication theme was then split into "Communication-Family" and "Communication-Friends". Coding identified shared characteristics such as technology uses, parenting styles, food ways, etc. between families. Questionnaire answers were coded in the same fashion.

Interview and questionnaire coded quotes were combined into quote supported themes. Verity data and browser log histories were overlaid with the self-reported data to create a "unified narrative" (Rubin & Rubin, 1995) that allowed each family to be viewed singularly and as part of a larger community of practice (Lave & Wenger, 1991).

Confidentiality

The study was reviewed and approved by the Arizona State University Institutional Review Board. The Board found the study to be of "minimal risk". The study included individuals under 18 years of age and required parental approval in order

to interview the children and have them fill out the questionnaire. All participants were informed they could answer all, some, or none of the questions and could leave the interview at any time. All questionnaires were assigned a random number that did not tie back to their names. All transcriptions of the interviews used pseudonyms in all cases. No real names appear in any of the quotes, charts, tables, or figures. All conversations were recorded. Anonymity was provided to all participants. All documents with identifiable information, including all questionnaires, recordings and transcripts, were destroyed upon successful acceptance of this dissertation.

CHAPTER 4

RESULTS

Today's youth are spending more time in using technology than ever before. Rideout, Foehr and Roberts (2010) found the average school-aged child, aged 8-18, spends 7.5 hours a day, 7 days a week, using digital media outside of school.

Prior studies (Andrade, 2008; Hinton, 2012) reported unschooled children use technology extensively. Parents in all 10 of this study's families shared concerns about how much time their children spend in front of "glowing rectangles", a term I will use to describe all powered electronic devices with a screen, from iPod to big screen TV. Despite observations of previous researchers, and parental concerns, there has been no quantified study of exactly how much screen time occurs. No information exists on specifically what sites and software are actually being used. This study, by way of a questionnaire, semi-structured interview, browser logs and Verity software's capturing of actual use provides answers of how unschooling children actually use technology.

Survey Says!

A questionnaire (Appendix A, B) was given to all participants. It asked for demographic information, what technology was in the home and what devices were owned by the children. It requested participants self-report how many hours a day technology was used, how it was used and what it was used for.

Demographic Overview. 10 unschooling families were given surveys. Out of a possible 20 parental respondents 13 parents responded, 9 mothers and 4 fathers. 19 out of a possible 22 children filled out the survey. The youngest child in the survey was 9,

the oldest 19. The average age was 12.4 years old, the median age was 12 years old. 5 females and 14 males responded.

Technology Demographics. All fathers answering the survey (N=4) work in the IT industry.   Job titles were analyst, engineer, and two Directors. The interviews revealed of the 6 fathers that did not participate in the questionnaire 4 are also in the IT industry, 2 software engineers, a hardware engineer, and a database programmer. Of the remaining 2, one is an at-home stock day trader, the other a Professor of Applied Mathematics at Arizona State University.

In each household the father built and maintained the IT network. Each home possessed hi-speed internet (10MB+), wireless 802.11N (or faster) networks, and 10 or more IP addressable devices. There was more than one internet accessible device per household occupant. Firewalls running at least WEP level security protocols were present in every home. All PCs were running up-to-date anti-virus software. Each home possessed one or more of the following advanced technologies, guest Wi-Fi, port forwarding, remote backup, centralized shared storage, and LAN connectivity. Parent's personal machines were, at most, 2 years old. Windows 7 was installed on over 90% of all PCs with only 1 person possessing Windows 8. Macintosh computers were rare (N=2) and no children used Macs. Older hardware was passed down to younger children in all homes.

No homes had active internet content control or filtering software. Numerous fathers stated such software had been tried but "filtered too much content" (Kevin Monro) and "was more of a hassle than it was worth" (Mr. Andes). In place of content

filtering software all internet browsers had the "Safe Search" option defaulted to "on" and pop-up blocking software was installed. Parents relied on candid discussions about the dangers present on the internet instead of using controlling software. Children were advised to not go to unfamiliar sites and to ask parents or older siblings (where applicable) if they ever had any questions or concerns while on the internet. The unschooler's creed of trust children was applied to their use of technology.

Only 2 families, the Marik and the Monro, said their children had a daily computer usage time limit. The remainder of the families followed unschooling beliefs in allowing children to self-regulate. The mothers did express concerns about the time their children spent on PCs, concerns their husbands did not share to the same degree. I attribute the husbands' reduced concerns about playtime because in all cases they were "gamer dads", individuals who grew up playing video games. Additionally they work in the IT field and are around technology every day. Lastly, some mothers observed their husbands "were not home during the day to see what a 10 hour video game day looks and feels like" and believed if the husbands were home all day they may take a dimmer view of marathon video game sessions day after day. The one husband who stayed home all did, indeed, express concerns about the amount of time his children used technology, suggesting the mothers' observations may be accurate.

Children's Ownership of Technology

The survey asked the children what kinds of internet accessible technology they personally own. Figure 9 provides the breakdown by form factor and Table 2 provides specific ownership information. The average respondent owned over 4.3 devices, the

median was 4 devices. Almost all of the devices owned (N=80 out of 81) were IP
addressable and had direct access to the internet. The lone holdout? A Nintendo
GameBoy Advance Color.
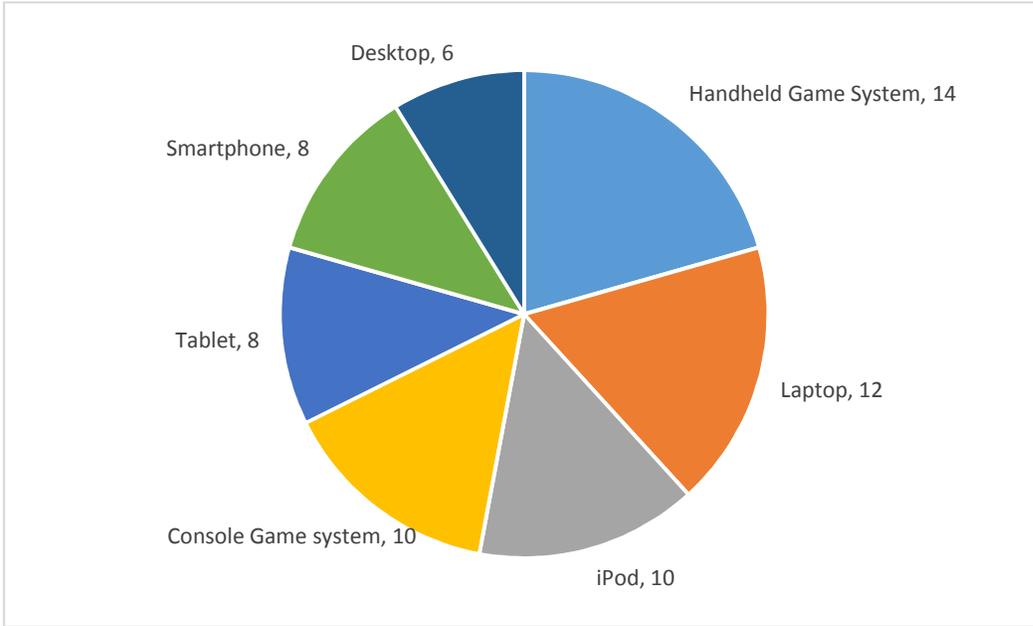
Figure 9. Hardware form factors owned by participants

Table 2
Child technology ownership

	Desk top	Lap Top	Tablet	Hand Held Game	Console game system	iPod	Smart phone
Adrian Smith	y		y	y	y		y
Lisa Smith			y	y	y		y
Jason Ball		y	y	y		y	y
Derek Damahat		y		y	y	y	y
Corvin Damahat		y		y	y	y	
Jennifer Damahat		y		y		y	
Nate Jones	y	y	y	y	y	y	y
Steve Jones		y	y	y		y	y
Ben McIntosh	y		y	y	y		y
David McIntosh	y	y		y	y		
George Librio	y	y	y	y	y	y	
Harold Librio		y	y	y	y	y	
Robert Marik		y		y			y
Victor Marik		y	y	y	y	y	
Melissa Marik		y		y			y
Harmony Monro	y			y	y	y	
Chris Monro				y			
Michael Redd		y	y	y	Y		
Tina Tay		y	y	y	Y		

"Handheld" refers to handheld video game systems built by Nintendo and Sony. All handheld gaming systems in this study were configured to access the internet and, when present, Bluetooth was configured for local gameplay. 19 children said they owned 1 (or more) handhelds. All 19 respondents owned at least one handheld device manufactured by Nintendo. The 3 oldest males stated they did not own handheld devices on the surveys. However, during the interviews they revealed they had passed them down to a sibling as they had moved on to using smartphones, tablets and/or laptops exclusively.

Laptops were owned by 15 of the 19 children in the study. All 15 ran a version of Windows and all had internet access. The oldest laptop in the study was approximately 5 years old. The laptops were used primarily as gaming devices, running games such as World of Warcraft, League of Legends, Realm of the Mad God, RoBlox, Terraria, Minecraft, Diablo 3 and numerous Steam and GOG games. Nearly all of the games played were multi-player and required internet, or at least LAN, access to be used. Single player games were rarely mentioned as being played, reflecting current trends in game design. Skype was installed on every machine and all children attested to running Skype in the background nearly all of the time. Each of the laptops had a camera either installed in the bezel or as an add-on clipped to the lid top. For all children younger than 15 the camera had been defaulted to off and was to only be used when speaking with family, such as grandparents, and known friends. All laptop microphones were enabled for Skype use.

Personal desktops were owned by 6 of the 19 study participants, meaning multiple children owned their own desktop and laptop. The desktops ranged from cutting edge i7 processors with 8+GB of memory and terabytes of storage replete with multi-monitor displays to 5 year old hand-me-down machines. Even the slowest desktop, however, was spec-wise as powerful as the medium powered laptops. 9 of the children had been given the option of choosing owning a desktop or a laptop and, in all but one case, the child opted to own a laptop. Jason Ball captured the spirit of the reasoning behind selecting a laptop, "It gives me the ability to play my games everywhere and I can do anything on it."

Children less than 12 years old accessed desktops located in a common room in the house such as the kitchen, living room or family room. The monitor was positioned so it could clearly be observed by anyone walking by. For children 12 years and older desktops were housed in their rooms. Laptops were used throughout the house with no room restrictions.

10 of the 19 participants owned their own iPod and 9 of the 17 owned their own smartphone. All of the iPods and smartphones were wirelessly enabled for internet access. Skype and Facetime were installed on each iPod and all smartphones had Skype, IM and text capabilities. All but one of the children over the age of 12 owned their own smartphone, and the 1 exception was, according to his mother, going to be receiving one as soon as her plan allowed her a new free phone upgrade. All of the smartphones had 3G+ capability for internet access outside of the home with most using the substantially faster and more reliable 4G connectivity standard.

In this study I consider iPods and smartphones as functionally analogous on the basis that both devices are small and provide easy internet access. With this view only 3 participants in the study did not personally own a small, smart device of some kind. However, 2 of these individuals owned their own laptop. Only 2 children in the study did not own personally own a desktop or laptop. However, both accessed a communal desktop that was, for all intents and purposes, their own personal machine according to their parents.

Over half (N=11) of the participants owned their own tablet. iPads and Android devices such as the Samsung Galaxy and Google Nexus were defined as tablets in the

questionnaire. All of the tablets were configured to access the internet wirelessly. In interviews tablets fell into two distinct categories of use. The first involved casual gameplay, with titles such as Plants vs Zombies, FTL, Temple Run, Bejeweled and various tower defense games and asynchronous, multiplayer games such as Words with Friends. The second use category was internet browsing. Individuals that owned tablets used them to browse the internet in preference to every other technologic medium, citing their portability, ease of use and high resolution screens.

Console game systems, such as Xbox, PlayStation and Wii, were present in all 10 households. Each was configured to access the internet. The previous console generation (Xbox 360, PS3) introduced the ability to stream video. Netflix, Hulu+ and Amazon Prime are all capable of being streamed to the largest screen in a family's home, the big screen TV. All of the families reported using consoles in this fashion with many of the homes (N=5) stating they use the console to stream video more than to play video games. "Binge viewing", or the watching of multiple episodes of a show back-to-back on a streaming video service such as Netflix, was reported in nearly all of the households (N=8). Though all consoles were capable of conducting internet searches there were no occasions identified where they were actually used to do so. In all households participants stated it was easier, and faster, to use a tablet or smartphone to look something up, even when compared to consoles with voice enabled search capabilities.

Video game consoles were used to play video games but such play was typically done during playdates and sleepovers. Local multiplayer games such as Castle Crashers, Spelunky and Super Smash Brothers Brawl were universally touted as great sleepover

games by parents and children alike. These games can be played by up to 4 children side by side in the same room, either in cooperative or competitive modes. They lack the gritty, realistic, and gratuitous violence of many video games. The mothers and fathers in the study had all played these (or thematically similar) games with their children on multiple occasions and understood the games' terminology and purpose.

All unschooling mothers in the study, and many that I spoke with at park days, have banned violent 3D shooter games such as Call of Duty because of their own strong dislike for gratuitous violence. When pressed to explain how restricting a game meshes with the unschooling philosophy of allowing children freedom of choice they explained that, as a parent, their job is to help guide their children towards healthy, nutritious options when possible or, at worse, provide them empty calories. They viewed violent games as not empty calories but actually as negative influencers. They saw no positive benefits from playing ultraviolent games when other games with similar to identical same mechanics were available to play. Janice Ball referenced studies about video games and violence,

> "Though they likely do not lead to children committing violent acts I don't like violence and would rather my children not play violent games".

Many unschooling mothers, when dropping off their children at my house for a playdate, asked me to not allow their children to play ultraviolent games. Fathers, on the other hand, when dropping off their children, have said to me it is ok to "look the other way" if the kids wanted to play certain games. Some admitted to playing such games with their children when their wives were not around!

Video games are acknowledged as having some benefits to children by the unschooling parents. Some parents showed me copies of Gee's (2007) book on video games and learning, saying that the book legitimized their children's use of video games. Though studies have suggested some benefits of video games (Gee and Hayes 2011, Salen 2007, Shaffer 2008, Squire et al 1998, among others) none of those authors advocated the children play nearly 8 hours a day, 7 days a week, which is what Rideout et al (2010) found was the average amount of time schooled children were using digital media outside of school. As I will demonstrate unschooled children are spending more time than schooled children on digital devices.

Form Factor

The distribution of hardware devices within my study group is similar to that of the broader IT product landscape as a whole. Portable, multifaceted devices have supplanted desktops and e-readers in annual units shipped (Gartner, 2014). I predict as my sample population enters their teen years the smartphone percentage ownership will come close to, if not exactly reach, 100%. I also foresee tablets will begin replacing laptops, especially with the power and versatility of new form factors like the Microsoft Surface 3 and Lenovo Twist, as the preferred hardware device. As prices of the new hardware form factors come down a consolidation of devices will result. I predict that, even with consolidation, smartphone use for social media access will not reduce in frequency.

Wireless

The Damahat family routinely uses a cell phone to act as a wireless hotspot while on road trips. Other families have experimented with this technology but are not yet willing to implement it full time because of bandwidth expense. The Damahat's use the hotspot to allow each child to listen to their own Pandora music stream, an application that consumes small amounts of data. The children of the Jones and McIntosh family want to use the wireless hotspot to stream bandwidth-heavy content such as Netflix, Twitch or play games such as League of Legends. Streaming a typical movie will consume between 1 and 3 gigabytes of data, per device, meaning even today's robust data plans can't keep up with a long road trip's potential consumptive capabilities. However, but a few years ago using 1GB of data in a month was inconceivable so if technology continues its trends full access to the internet via an automobile should arrive within the next few years.

Self-Reported Website Usage and Comments

The questionnaire asked parents "what educational websites do your children use"? YouTube and Khan Academy were tied at number one, with 6 parents listing each of those sites as places their children went to learn. The tie made Wikipedia the third most used website in the survey.

The children were asked the same question and 13 of the 19 said YouTube was the number one website they used for educational purposes. Wikipedia and Khan Academy tied at 7 votes each for second place.

Khan Academy. Khan Academy, a website providing videos on how to learn math, science, art history and more, was listed by the parents as the most common site their children visited. The children rated it as the second most popular learning site. However, Verity software logs confirmed YouTube was the most visited site, followed by Wikipedia. Khan Academy did not appear in any of the Verity logs. Seeking to understand this contradiction I asked children during the Verity software data review process to tell me how and when they would use Khan Academy. The Verity software subjects said they used it either when their parents suggested they "learn some math" or when they were trying to figure out a solution to a real world problem such as the need to calculate a percentage. Kendra Damahat's comment is illustrative of how many of the mothers get frustrated with their children's computer use and what their subsequent response often is:

> "I do ask them to do stuff sometimes, like if they spent 3 days playing computers so go do something else. Board games, reading, audiobooks, math. Radical unschoolers say we aren't an unschooler because you told them do something. I don't say chapter 8 pages 14-32 I say do Sushi Math or Khan Academy. Derek was thinking about taking a high school equivalent chemistry class to be taught by one of the park day moms. It required Algebra 2. I have absolutely no idea what is Algebra 1 or 2 so I ask him to zoom through the Khan Academy and bust out 8 assignments in a row to get it done. We got out a fraction puzzle the other day because Jennifer said she didn't know fractions. The boys like Khan Academy but Jennifer doesn't as much."

Leeza Jones stated her children,

> "They do learning via online, the Khan Academy videos."

Yet during my interview with her oldest son, Nate, he said,

> "I tried to do math but I could not do it on Khan Academy."

With such a usage pattern in mind I began looking at web browser history logs that contained usage information outside of the Verity study period. I was able to locate actual use of Khan Academy but it was sporadic.

Khan Academy was ranked number 1 on the parents' and number 2 on the children's response to "educational websites your children use/you use" survey question, yet no one seems to actually use it to the level self-reported. Verity logs captured only 14 days of PC usage. Using internet browser history logs I was able to analyze the prior 90 day PC usage of 5 children in the study. In the 450 days of PC usage I uncovered only 8 instances of Khan Academy being accessed. The children remembered going to the sites and guessed they spent approximately 30 minutes doing math problems, accessing between two and four modules. When I asked the children to show me how many badges they had earned on the site I noted very few had been earned and many of the children didn't know their login email address or password.

Khan Academy was praised by all of the parents, and most of the children, in my interviews. Though they verbally proclaim their fondness of the site its Verity usage data indicates it falls into the category of exercise, something they know they probably should do but don't get around to doing with anywhere near the frequency they think they should.

Allen Damahat provides some insights into how unschoolers use Khan Academy in particular and online courses in general:

"We do a lot of Kahn Academy and some online learning but tried it for a little while then they lose interest. They get as far as they want to get then they want to change and we look for something different."

Allen's statement was typical of the parents in the study. They repeatedly stated the children would do a burst of work until they were satiated, tired, or bored and then would move on. The parents didn't have a guess as to how long those bursts were but I am certain they are not as long as parents believe they are.

Unschooling parents across the U.S. say school takes far too long to teach specific concepts, especially in math and science (Kirschner 2008, Hinton 2012). Unschoolers do not equate time-on-task to learning and, in fact, believe time-on-task is not a good way to measure learning whatsoever. The story of Jack Reeza's son Nate's experience with public school mathematics was told to me by multiple families to illustrate how schools take a simple process and stretch it out needlessly.

Nate, 15, desires to be a professional baseball player. He has never attended a public school yet opted to enroll in a public high school in order to work with a specific baseball coach who has tremendous success placing players into top ranked college baseball programs. The Mesa School District would allow Nate to play baseball in his address-assigned school without attending classes. However, the coach he wanted to play for worked at a different school which meant Nate would have to enroll as a full time student in that school in order to work with the coach of his choice. Nate had never taken

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a math course or formally studied math. He understood addition, multiplication, subtraction and division but had never encountered multiplying or dividing fractions, nor much algebra beyond the most elementary forms. Within a few days it became apparent how far behind he was in relation to his peers. In order to play baseball Nate had to maintain a minimum GPA, a minimum that would be in jeopardy if he couldn't achieve at least a 'C' in the class. Nate's father Jack proposed they work 2 hours a night on math fundamentals to get Nate caught up. In a span of but 2 weeks Nate was at grade level and he completed the class with the 5th highest overall score. Upon class completion his teacher suggested he take a more challenging math class next year. Nate was frustrated by the slow pace of the class. After his 2 week blitz, that saw him begin with addition and end with fractions, he stated he could have mastered the courses remaining content much quicker than what the curriculum allowed for. He also expressed anger and frustration that so many of his peers made no effort to learn the material, they just didn't seem to care. They didn't want to be in the class and grades had no appeal to them. Nate knew he needed to maintain a minimum GPA in order to pursue his passions, that school was a means to an end to him. He marveled at the school's inefficiency when compared to his life of learning what he wanted at his own pace, stating classes such as history and science were equally plodding and highly restrictive compared to when one pursues one's own interests.

The unschooling community holds Nate up as an example of how a child will learn what they need, when they need to, and to force them to learn anything before they have a compelling reason to do so is an effort in futility. They also point out that Nate

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learned, in a few weeks, what his peers had spent years learning. Other unschooling children that attended formal classes, such as Robert and Melissa Marik, stated it took them but 2 or 3 weeks to meet grade level proficiency or, in the case of community college, prequalification requirements, despite having never had formal coursework of any sort on the subjects they studied.

Unschooling parents often cited their own academic histories as reason for concern about how schools work today. Nearly all of the parents were excellent students themselves and yet all stated they crammed to pass tests and, unless they were interested in the subject, they quickly forgot the material, even if they achieved an 'A', the material was forgotten in but days.

Kendra Damahat, Janet Ball, Jane McIntosh and other mothers sometimes struggled with the dichotomy of asking their children to use Khan Academy, Sushi Math, Dragonbox or other "learning" technology after the children had long marathons of video games or Netflix watching. Kendra commented,

> "Radical unschoolers say we aren't an unschooler because you told them do something",

Unschooling mothers in my study do feel the need, at times, to suggest their children do something other than simply play video games. They often say they feel bad telling the children to go do something educational or active but they feel frustrated when their children are using technology hours on end, completely sedentary.

YouTube. Parents (N=8 of 13) and children (N=13 of 19) named YouTube as the number one website used for educational purposes. Parents also identified YouTube as

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the number two (N=6 of 13) non-educational website their children used. Verity software and internet browser logs confirmed YouTube was the most commonly accessed non-search engine website. Jack Jones spoke for all of the parents when he said of his children, "They are YouTube junkies."

Parents praised YouTube for its educational content yet were frustrated with it because the "similar content" links on the right side of the page often lead to hours of watching, as an example, prank videos. Logs verified that YouTube was used in one of two ways. Either with minimal (1 or 2) mouseclicks, denoting its use to answer a specific question, or 10+ clicks in a row. This denoted numerous videos being watched back to back.

YouTube – Edutainment. YouTube was lauded by parents for its ability to generate thoughtful discussions yet it frustrated parents because of the amount of time children spend on it. Kendra Damahat, regarding YouTube's usefulness in educating the entire family,

> "Derek and Corvin are doing online Java programming classes and using YouTube for help. We found a YouTube channel called 'Crash Course in History, Science and Literature' and it is really funny and the guy talks really fast and covers tons of information and is a great jumping off point."

Her children use YouTube, in Kendra's words, to "replace traditional education's model of a teacher in front of the classroom. They are using YouTube to learn Java programming." Children interviewed in the study used YouTube to learn how to: modify an airsoft rifle, solder a circuit board, modify a robot, hack a soda machine, beat a video

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game boss, clean a motorcycle carburetor, etc.. The list was endless. The educational

value of YouTube comes in both instant answers, such as when Kendra Damahat needed

to quickly know the spare tire location of her new minivan, and in more thoughtful, long

term discussions that stem from 'Crash Course in History'. Kendra's "jumping off" point

is where unschool parents "jump on" and continue the discussion.

Verity software verified the allure of the suggested links that appear on the right

side of a YouTube page. If a video clip was found amusing it was quite likely the child

would click on other links made by the original poster or click on similar looking videos.

When a participant discovered a channel they really enjoyed, such as when one individual

discovered the 'Epic Rap Battles of History' (ERB) channel, nearly 2 hours was logged

while the viewer binged on other ERB videos that were up to 3 years old.

YouTube's educational channels are capable of generating similar levels of

"stickiness". David watched a video on camouflaged insects which led to him to watch 6

more videos in a row on camouflage. This video binge resulted in a discussion with his

family about what makes camouflage work which led to discussions about genetics and

selective pressures. David's camouflage videos were watched on an iPad at the dinner

table, not on his desktop. The family gathered around the iPad to watch nearly 20

minutes of animal camouflage capabilities. The family then spent another 30 minutes

discussing what was watched, how camouflage worked, and what animals live in the

local desert, like geckos, scorpions and rattlesnakes, employ camouflage. The family

then set out to find these animals in the wild by way of a hike. This action led to another

series of contextualized learning events. This example shows YouTube in action as

edutainment. Though it was entertaining watching the videos the discussions that resulted ended up being educational.

YouTube – Creation. YouTube allows users to easily upload content. The feedback and comments sections that appear beneath all videos encourage viewers to engage in a dialogue with content. 15 of the 19 children had loaded content they created on YouTube. Most of the content consisted of video game tips, tricks and walk-throughs. It was fascinating to watch 9 year old David use video capture software while narrating how he was clearing a video game level of a certain group of monsters. When done with the game he edited the final product and then loaded it onto YouTube.

David, and many other children, also use in-game supplied editing software to build levels for racing, fighting, and adventure games that they then upload for other children to play and comment on. The videos are not limited to video games as Victor Marik, age 10, routinely makes stop-motion Lego videos that he uploads to YouTube. Randy Andes loads airsoft and robot how-to videos to YouTube as well.

The children sometimes received feedback, not all positive, on their YouTube content. Commenters would leave feedback on the YouTube page itself or, more rarely, make direct contact via email. It is unlikely the commenters knew they were commenting on the work of younger children as, for safety purposes, the children did not post information about their age, gender, or geographic locale. I observed the children take comments and criticisms in stride. The comments were typically perceived as helpful. The children intentionally loaded their creations on sites where like-minded players would see them. The only grades the children received were those of public

opinion. If the level was well made it would be well received and the children took pride in their work. If they created a level that was lambasted they would consider the criticisms and make changes where they believed were warranted. Unschooling parents hold such self-motivated, often complex, creation as evidence as to why unschooling is a great way for children to learn. The children could work on a level for as long as they wanted, typically many hours were involved in their work. They were never told they had to incorporate element X or theme Y, and they weren't formally graded at the end. Instead their work was reviewed by fellow enthusiasts. If a level was deemed "bad" they would delete it and start over, having learned some aspect of level design along the way. Unschooling parents argue this is a far more authentic way to learn, especially considering all of their creation actions have a context, versus the decontextualized, often arbitrary, assignments given to children in school.

Video game related content was not the only content created. Harmony Monro posts bi-weekly uploads to a fan fiction site. David Marik uploads aerial photography videos. George Librio hosts Twitch streams and uploads narrated video game highlights to YouTube. These children take great pride in their work. The efforts are labors of love and interest, they were not construed as assignments to be handed in and forgotten. The participants that attended Eagleridge commented that the work they did in their classes, when bound by constraints and required particulars, never provided them the same level of personal satisfaction that their own personal projects did. They did, however, admit that at times some of the school-like projects were fun in that they had to work within specific parameters that at times were challenging.

Wikipedia. Parents and children listed Wikipedia as the second most used site for educational purposes. Parents said they, and their children, typically used Wikipedia to find answers to specific questions. Verity logs indicate Wikipedia was rarely grazed for long periods of time, rather it was viewed quickly and then exited just as the respondents had self-reported.

The perceived accuracy of Wikipedia's data existed in a continuum. Melissa Marik referenced a study her PhD father showed her regarding the overall accuracy of Wikipedia versus dedicated websites when she discussed Wikipedia's value with me. She said the researchers concluded Wikipedia's information was nearly identical to information found on sites dedicated to specific topics. Her father advised her that, for general inquiries, Wikipedia was an acceptable source for answers, a conclusion she says she shares with all of her friends. In contrast, Mrs. Andes advised her son Robert that Wikipedia is ok to use but all information found therein must be verified with additional sources as she "didn't trust Wikipedia fully." The remaining families viewed Wikipedia as quite useful with fact legitimacy to being "good enough" for their needs.

Wikipedia's expansive topical coverage combined with a usually succinct summary section made it the go-to site for fact-based questions. I believe Wikipedia was listed behind YouTube by both parents and children because neither group realized how often they actually visited Wikipedia on their mobile devices. Verity was not able to track smartphone, tablet or iPod usage but personal observation noted that if an answer was not known, to essentially any question, the query was entered into a browser search bar and, invariably, Wikipedia returned the first hit, which was then clicked on. The user

would then scan the article, often reading parts aloud, until a satisfactory answer was obtained. Discussions often ensued. During the family interviews questions about various topics would arise that resulted in interviewees, children and adults alike, seeking, sometimes racing, an answer from the internet, an answer that invariably came from a Wikipedia page.

Wikipedia is not the only source of wikis. Children were very familiar with game specific wikis. The children in this study have never known a world without near instant access to factual information. The ease and second nature of the internet was cited by parents as a reason to question the value of organized schools. Parents view technology as indispensable for an unschooling educational style. They said there is no way they can predict what questions children will ask or what interests they may have. The parents repeatedly expressed disdain of the public school system's continued adherence to inflexible curricula when technology should allow child-created curricula.

The unschooling parents believe technology allows children to pursue the details of any subject, but how those details are discovered, analyzed and synthesized are the most important aspect of education. The parents in this study were heavily involved in their children's interests. Not only did parents patiently listen as children waxed eloquently about the advantages of lithium polymer batteries over nickel cadmium in radio control cars, or the long history of sniper rifles in the U.S. Army, the parents engaged, they asked additional questions. They showed the children that the child's interest was important. I heard mothers say, "I'm not that interested in that topic but you obviously are so tell me what about that topic makes you happy." I did not observe

parents telling their children not to pursue an interest, or that they shouldn't like

something. I asked parents if there were subjects that were "off limits" and universally

they answered no but, if a child was interested in something that was, to the parents, age

inappropriate, they would explain to their children that they needed to be older to learn

about such material. The trust and open dialogues between the parents and children, at

least for the children in this study, was enough such that children would respect their

parents' suggestions.

Wikipedia was cited by parents as a great place for children to "get their feet wet"

on a topic. Between Wikipedia and YouTube a child interested in monster trucks may,

after reading the Wikipedia page and watching a number of YouTube videos, no longer

be interested in that topic. Or they may ask for tickets to see the Monster Truck

Extravaganza at the local arena. Though not every child or parent marked Wikipedia as a

commonly used education site all of the children over age 12 visited it with regularity,

over 100 times a week according to the Verity logs. Younger children (<12) visited

YouTube more than Wikipedia. This age discrepancy may be as a result of some of the

younger children not being confident in reading for in unschooling culture there is no set

age a child has to be reading by. Two of the 10 year olds in the study were hesitant

readers, while another was reading college level textbooks on subjects he was interested

in. The standard in unschooling is there is no standard. YouTube, by requiring only

listening and visual skills, is more accessible than Wikipedia for such children. I believe

as some children age and become stronger readers with a better sense of article flow they

gravitate towards Wikipedia as they can quickly scan the page, find what they are looking

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for, and move on. For the young children that are already strong readers I believe their

preference of YouTube over Wikipedia stems in part from the fact their Wikipedia

questions are usually shared with their parents which results in using tablets and

smartphones to find answers, and this use was not tracked by Verity in this study.

Non-Educational Websites Used

Every parent felt obligated to remind me that, "everything is educational in some

way and therefore this question wasn't accurate" and therefore the survey question "What

non-educational websites do your children use the most" wasn't appropriate. In each

family interview I responded by asking them to answer the question from the perspective

of how a non-unschooler would answer it. After discovering the issue with the question I

chose to keep it worded as it stood as it allowed a conversation about their definition of

learning to happen for each family.

Minecraft. Minecraft was named by 9 of the 13 parents as the top non-

educational site their children used. Yet only 1 child listed Minecraft as a top site they

used for any reason, educational or otherwise. Parents specifically referenced Minecraft

as a site that their children are amazingly creative on during the interviews. In follow up

interviews I was unable to determine why parents marked Minecraft as a non-educational

site so often on the questionnaire.

I believe Minecraft's inaccessibility to parents contributed to its appearing as the

number one non-educational site their children visit. Surprisingly, none of the parents

had actually played Minecraft. They all had watched their children play but they didn't

understand the point of the game. The pixelated graphics and, to the parents, mindless

and monotonous wandering around looking for wood, seemed to be nothing more than a waste of time. Jane McIntosh, in commenting about Minecraft and other simulation games, "I'd rather be living life than simulating life."

The children didn't list Minecraft as non-educational because they believe the site is quite educational. They said Minecraft helped them about learning about resource management, teamwork, and creativity as the game encourages the participant to design anything they can imagine.

Despite parental views of Minecraft as non-educational over the course of interviews, at park days, and at conferences, Minecraft was repeatedly cited as a software children enjoyed creating content for. Nearly every child in my study had, by the age of 13, created Minecraft content. Minecraft, and its 2D counterpart Terraria, is the kind of sandbox game children enjoy tinkering with. The game's physics and open world structure allow for near infinite combinations. I observed children making carefully crafted, well thought out, Minecraft houses. Some were designed for defense against Zombies while others were Taj Mahals, designed to impress their online neighbors. Minecraft's tool editor is simple enough for children to quickly use but deep enough to offer those that are interested a deeply sophisticated level-editing experience.

Facebook. Parents listed Facebook as the number two non-educational site used most, tying it with YouTube with 6 votes. However, no child listed Facebook anywhere in the surveys and Facebook did not appear in any of the Verity logs. Analysis of browser logs with 90 days of history did find limited use of Facebook, and when

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discussed with the children they said they were visiting product pages or family and friends pages to, for example, watch a video their iPad couldn't play.

Verity logs and web browser inspections revealed that Facebook was not being used by children on their desktop or laptop with any significant frequency. Participant comments during interviews, as well as personal observation, revealed Facebook was used by children, but only on portable devices. Harmony Buceck used it "only on my iPod". Adrian Andes said, "I'm on Facebook 24/7 most times. I don't post, I read other peoples stuff" but he only used it on his smartphone. Melissa Marik said she had recently received a smartphone and,

> "I'm on Facebook quite a bit, I use it mostly for recipes though. My friends use it all the time posting things about themselves but I don't like to use it for that".

Her brother, 19 year old Robert, says,

> "I live on Facebook. It is on my phone all the time. It is the way people in college communicate".

Robert is 19, Melissa is 15, Adrian 14 and Harmony, 12, and they were the only self-reported regular users of Facebook. None of the other children, ages 13 and under, reported having a Facebook account or, if they did, they didn't use it. Mr. Andes said his daughter, Lisa, 11, "Lisa wants a Facebook account but she is too young." Facebook itself states users must be at least 13 years old.

Parents see their children on Facebook and view them as consuming information only. Other than arranging weekend plans or celebrating personal accomplishments and

milestones such as running a marathon, winning a part in a play or celebrating birthdays, the parents were concerned that children spent too much time on Facebook just "wasting time". This latter interpretation I believe derives from their own feelings about Facebook. Mrs. Andes,

"I Facebook because I enjoy connecting with people and use it as a business tool. I make a schedule for myself. If I don't I'll Facebook all day."

Janice Ball,

"The more I'm on Facebook the more I'm on Facebook. As soon as I start looking at it I keep it going."

Jane actually deactivated her Facebook account,

"I found myself spending way too much time reading about other people's lives instead of living my own."

Neither Janice nor Jane's children have a Facebook account. The remaining mothers in the study report using Facebook sporadically and then mostly to keep in touch with their friends, family and relatives. Petra Marik, for example, has family overseas and Facebook is the most practical way to keep in touch.

Unschooling parents struggle with Facebook not only as I assert because of how the parents use it and presume the children are using it similarly but also because the parents don't truly understand how omnipresent Facebook is in children's lives today. Facebook is how artists share their information and how new businesses go to market. A generational gap involving social media is in place, one that unschooling parents may not

recognize. Unschooling parents didn't feel Facebook provided the kinds of educational experiences they hoped their children would enjoy.

The children using Facebook in this study prefer to use it on a mobile platform. Even when on their laptop I observed children using their smartphone to access Facebook. Adults spoke of their Facebook use as being done at their desktop or on their laptop, typically during the evenings. They did use it on their smartphones but only rarely. In contrast children that used Facebook used it at all hours of the day and night and almost exclusively on their smartphones/iPods.

Instagram. Instagram was listed by 4 parents as a non-educational site used by their children. On the questionnaire only one child named Instagram as a website commonly used. In the interviews Instagram was never mentioned by any child and it never showed up in the Verity logs. The parents that listed Instagram as a site commonly used by their children were the parents of the older teens (19, 15, 14). Instagram is a site frequented by older children and is likely used by many of the teens in the study based on the fact that so many children said they use photo manipulation software. In interviews I realized the questionnaire contained a flaw, that being it made no distinction between apps and software. Future questionnaires should make apps a distinct category. In this study had I asked what apps were used I believe Instagram would be ranked higher. The parents made no distinction between an app used on an iPad or tablet versus a software package used in Windows while the children did indeed make such a distinction.

Netflix. Netflix was listed by 3 children as a commonly used non-educational site. Each family used Netflix or a similar streaming service such as Hulu Plus or

Amazon Prime in their homes and, during interviews the parents, and children, talked about watching educational shows like National Geographic, Omni and MythBusters yet none listed Netflix as an educational tool.

Netflix, Hulu Plus and/or Amazon Prime were present in every household. Many of the families in the study spoke of their Netflix binging, a process where they sit down, typically as a family, and watch 4, 6, or 8 or more episodes of a show over the course of an evening. As Leeza Jones put it,

> "We have veg-out days, the Netflix binge watching. Now instead of watching an hour show then go do something else we watch the next episode and blow through an entire season on the couch with a bowl of popcorn. I am cool with that but the fine line is how many days in a row do you allow that to occur, before you get up off the couch and go do something else."

The parents struggle about time spent watching videos for, in a philosophy where children can self-direct and one considers everything in life as learning, at what point do they step in and say enough?

Mrs. And Mr. Andes had an illustrative exchange of how parents aren't always on the same page when it comes to binge watching on Netflix. Their daughter Lisa loves Gilligan's Island and Mrs. Andes is concerned that, left to her own devices, Lisa would watch it for days on end. Mr. Andes, however, felt it was important to have downtime.

> Mrs. Andes: Gilligan's Island [on Netflix] is a zombie effect [to their daughter Lisa].

> Mr. Andes: But it is so entertaining! It is downtime!

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Mrs. Andes: It is not learning, it may be productive for your mindset but it is not going to lead to any kind of productive effort as far as monetary means of sustaining yourself. There is a thing as too much downtime!

Photo Software

Photoshop software was listed by 9 of the 19 children as software they commonly used. During the interviews I discovered that Photoshop is the term the children use for any software that allows them to manipulate images digitally. It includes Microsoft Windows Gallery, CorelDraw, GIMP as well as Photoshop Elements, Photoshop proper and apps on tablets such as Instagram.

Photo manipulating software was named by over 50% (9 of 19) of the participants as their most used software yet the Verity logs did not show Photo products being used with any regularity. Follow-up questions revealed that the Photo software is typically used on their portable devices. All of their devices possessed cameras and they enjoyed using various filters and effects on pictures they would send to friends and family or upload to social media. Actual use of Photoshop-like products was much rarer and then only by the 14+ year olds for specific printing projects. I believe the high numbers of individuals that self-reported using photo manipulating software is, like Instagram before, a case of the questionnaire not separating apps from software.

Cheat Engine

Cheat Engine was self-reported as the second most commonly used software in the study, with 7 children using it. Verity confirmed Cheat Engine's popularity. Cheat Engine allows modifications to video games. With it one can increase one's health,

number of lives, weapons, armor and can be used to make a character move faster or to be invulnerable, or any of a hundred other uses. Cheat Engine has no instruction manual and is decidedly not intuitive. It requires much trial and error to be used properly. Its users said they learned by tinkering with variables and then seeing what happened, by watching YouTube videos and by Skyping with their fellow gamers. Some of the children in the study used more sophisticated hexadecimal editing software to change even more variables within a game, going so far as to bring character back from the dead in games that have "hardcore" modes where there is no saving or resurrecting. All but one of the Cheat Engine users have begun studying the computing language Java since using it for some time.

The children explained that Cheat Engine allowed them to view video games as more than just a game, but also as a series of lines of code that can be modified. Cheat Engine is the kind of software that unschooling parents use to demonstrate the power of a child pursuing their interests. The parents said the children would work deep into the night, if not the early morning, on their games. I watched Ben McIntosh spend hours tinkering with Cheat Engine trying to find the variable that controlled shield ratings in a game called FTL. Programmers do not make such variables easy to find and, at the time, there was no YouTube video on that topic. Ben was determined to find the variable as he believed the level designers had made an unfair level, one that could be remedied by using Cheat Engine. The Librio brothers were working on a video game that had been inspired by their using Cheat Engine to make changes in a game they enjoyed. During my interview with them they were using their smartphone to schedule a meeting with an

unschooled child with a talent for illustrating and writing dialogue. These brothers, aged 14 and 12, were very serious about creating their own Java driven video game. They showed me story boards, scripts, doodles of levels and characters that would be in the game. My initial interview with them was in June of 2014. In September of the same year they showed me their working prototype and were proud to show that they made the game "Cheat Engine friendly".

Microsoft Office

The third most cited software used was Microsoft's PowerPoint. 6 of the children said they regularly use it. All of the students that attended Eagleridge said they did many of their presentations in PowerPoint. Microsoft Word and Notepad were cited by 5 of the children, all of them also attending Eagleridge. Non-Eagleridge students tended to use the free Google Apps product line.

"Items I Am Good At"

The questionnaire had a section that asked children to list what they felt they were good at. 3 of the 5 females said they enjoyed dancing and were taking dance lessons. 3 of the 5 females also said they were excellent artists, enjoying painting and writing. None of the females mentioned video games as things they enjoyed doing or were good at.

11 of 14 males listed "video games" as things they were good at. The two that did not were the two oldest participants in the study and, according to themselves and verified by their parents and younger siblings, both were "hardcore gamers" when they were younger.

Reading was the number 2 most common answer, with 5 children saying they enjoyed reading. After that it was a multi-way tie with each subject appearing twice: archery, robotics, programming, music, sports, Legos, foreign languages and mathematics.

Voice Communication Restrictions

All unschooling parents in this study had advised their children to never use Skype, even the audio component, with people they did not personally know. Even with individuals that they regularly game with the parents strongly requested the children not use Skype, explaining to them that there are people that can't always be trusted, and that typing is, in their opinion, safer than actually speaking with strangers. In interviews the children said they adhered to this parental request and, though at times made team gaming difficult, they believed their parents were right to keep them off of voice chat. Jane told of a time when David had mistakenly accepted a chat request on Skype while playing a game. She was sending emails on her computer next to him when she heard a man's voice talking to her 9 year old son. It was the first time she realized Skype made it possible, though an incorrect setting or mispressed button for anyone to speak to her son. He quickly disconnected the call and blocked the user and promised to be more careful in the future. Other parents had similar stories of children making mistakes, or accidentally accepting a call, and then strangers were talking to their children. Parents expressed concern about Skype's ability to easily share screens, files and even remote controlling of a PC. Jane expressed concerns to David that he may see things he is too young to see when he is helping people install a mod as Skype lets him see the monitor(s) of the

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person he is helping, plus all web pages and files that have pulled up. The parents in this study had spent time with their children watching them use their software tools. Many, like Jane, installed Skype on their own machine and used it with her children to make sure she understood how the software worked and what potential risks existed.

Parents of older children did not delve into their software usage as much. They still requested strangers not be spoken to however, when the teens would say, as Derek did, "Mom, I've been playing World of Warcraft with these guys for the last 9 months" the parents were far more understanding and asked them to be careful and use good judgment.

Hours Self-Reported on Questionnaire

The children self-reported they spent an average of 6.1 hours a day using technology. Technology was defined as any "glowing rectangle, regardless of size" that they may use in a day. The females (N=5) reported an average of 4.5 hours a day of interacting with technology while the males (N=14) reported an average of 6.3 hours a day. Verity logs indicate the numbers were, for PC use only, over 7 hours a day on average. The parents averaged predicting 8.2 hours a day of technology use. The fathers predicted their children spent, on average, 9 hours a day while the mothers predicted 7.7 hours.

As discussed in the Methodology section I installed Verity software on 5 children's machines. Two participants were 9-11, three were 12-14 years in age. The software captured websites visited and software used along with number of keystrokes and mouseclicks, plus time spent on each website and program.

Verity Actual Usage Details

Child #1 PC Usage. Child #1's data will be used to represent the usage patterns typical of the 12-14 year old group. Though the specific games, websites and software varied somewhat between the 3 participants the actual use ratios were similar and total time used was within 4 hours for each participant. Child #1's PC usage for the study totaled 126 hours (Figure 10). This averaged out to 8.4 hours a day spent using the PC during the study period.

Child #1 Hours of Gameplay

World of Warcraft, 2
Skype, 2
All other programs , 2
Diablo 3, [VALUE]
Chrome, 17
League of Legends, 102
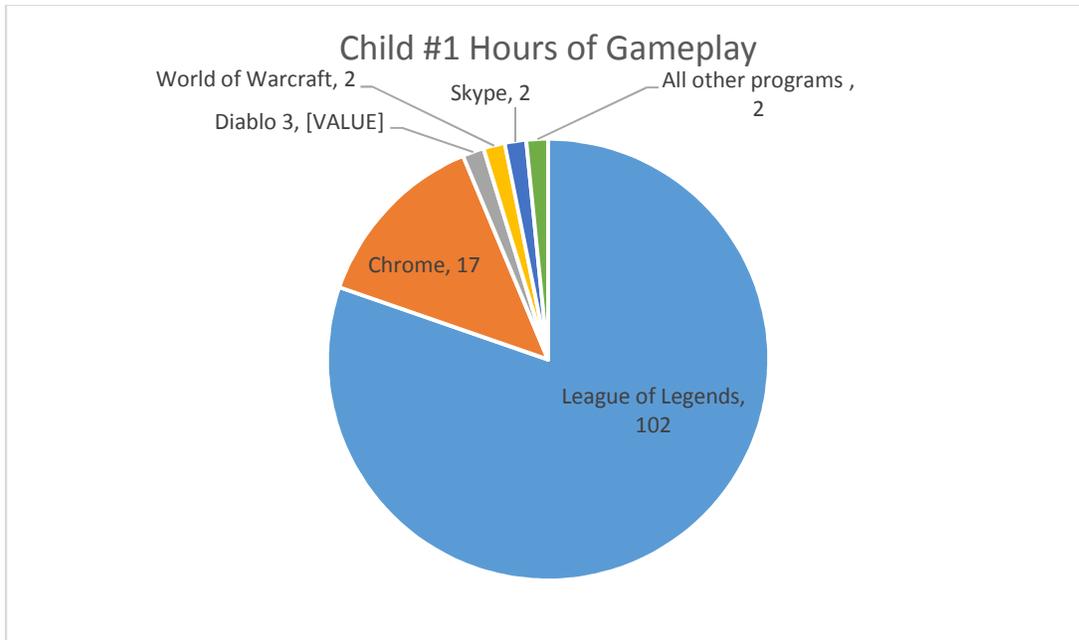
Figure 10. Child #1 hours played by category

The vast majority (85%) of Child #1's time was spent playing games, with League of Legends (LoL) being the most popular, taking 95% of his gaming time. League of Legends is a Multiplayer Online Battle Arena (MOBA) game, an extremely successful and popular game that is becoming, along with its competitor Defense of the Ancients (DOTA), one of the largest e-sports games in the world. China is being an e-

sports arena, the LoL world championships drew 18,000 people in person at the Staples center in 2013, selling it out in under an hour. 32 million people watched the live stream of the League of Legends Championship series making it more watched the NCAA Men's College Basketball Final Four (15.7 million), NBA Game 7 finals (26.3 million) or the BCS National Championship (26.4) (Makuch, 2013). 111.5 million people watched the NFL Superbowl. By way of example Ben's heavy use of LoL was in large part because of his desire to become a professional gamer. Robert Morris University Illinois became the first college to offer e-sport scholarships this year and 235 colleges and universities offer a Bachelor's degrees related to video game design (theesa.com 2014)

League of Legends requires teamwork in order for one's team to win. As such the teammates must communicate. According to the children older than 11 years old the majority of the games they play online are "pick-up games" with players they don't know. Because of parental restrictions and requests this age group does not communicate with them using Skype or any other voice software. In order to be a good communicative teammate these children learn to type quickly. None of the participants in the research study were formally trained typists yet all have created some form of typing that allows them to rapidly communicate via the keyboard.

Child #1's League of Legends pick-up games different strategies and tactics with specific in-game characters experimented with.

"Sometimes I want to practice using a specific power of a specific character, say Teemo, and so I'll join a game and practice that power over and

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over for a few hours. I'm good enough to help keep the team alive while practicing, otherwise I wouldn't get to play so much, people would kick me out."

By Child #1's estimation 75% of video game playing time is spent with people not personally known. Often this age group of children play with the same individuals but their whereabouts, age, ethnicity, gender and any other personal details are unknown or often unverifiable. The unschooling children in the Greater Phoenix area play video games while the local populace is in school meaning typically the children in the study were playing with individuals in different time zones and often in different countries. Child #1 especially loved playing online games after midnight in Arizona as that made it 4 pm in Japan. Child #1's interest in Japan led to taking classes, since age 10, at Mesa Community College and, by playing late at night in Arizona, this enabled practice typing in Japanese while playing games.

Child #1 spent a few hours playing other games, like Diablo 3, but these were minor distractions, often played on a second monitor while waiting for a specific League of Legends group to assemble.

Child #1 Browser Usage. Child #1, like all participants in the study, used Chrome as the internet browser of choice. On average the older than 11 year old group spent around 1 hour a day with Chrome as the active screen. The primary use of Chrome was to watch Twitch streams, with nearly 1/3rd of the time spent on Twitch.com (Figure 11). Like Skype it is important to note that Verity did not capture the true amount of time Twitch was watched as Child #1 streamed Twitch to a second monitor while playing League of Legends, waiting in the game's lobby for a game to start, or while playing

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other games. The Twitch time observed here was time spent with Twitch being the actual active screen.

Child #1 Hours in Chrome

Flash Games, 0.5
Wikipedia, 0.4
YouTube, 4.5
Twitch, 6.6
Searches, 5
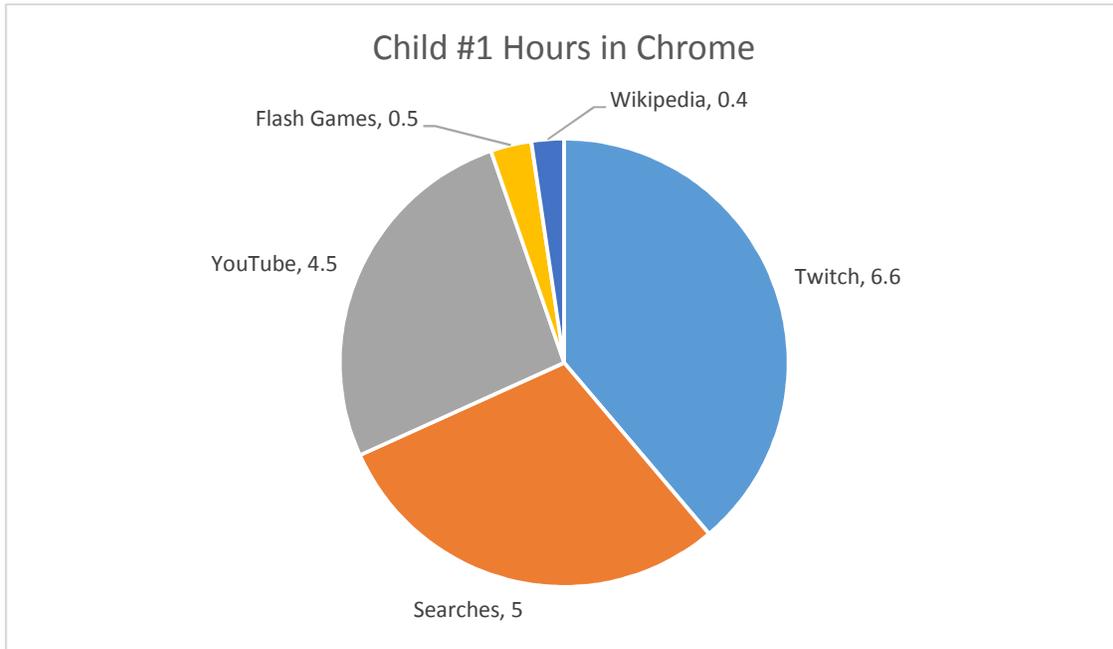
Figure 11. Child # 1 Hours spent in Chrome by category

Child #1 used YouTube for nearly 5 hours during the weeks observed. Studying the videos actually watched revealed over an hour of them involved tips and tricks for League of Legends. Nearly 2 hours were spent watching YouTube.JP videos. Child #1 enjoyed trying to understand what the Japanese commercials were saying. The remaining time consisted of pranks, jokes and funny videos that a typical 12 year old would like. The other older than 11 year old group had similar uses with actual content varying by individual tastes. Child #1 spent time commenting on videos uploaded by his friends. The average time spent on watching a video was 90 seconds. Verity indicated that this group often clicked on the "suggested links" on the right side of the page before a video

was finished. Videos over 2 minutes in length were almost never watched to completion, rather viewers would jump around within the videos, clicking on different parts of the video to get the gist of it.

Wikipedia was used for on the PCs for less than 30 minutes per week during the Verity monitoring period. Child #1 used it to glean specific pieces of knowledge needed at that moment. Wikipedia searches consisted of specific topics such as "what is a Wiccan", a term that was encountered while playing League of Legends. A search for "Singapore" resulted because Child #1 played with someone from there and wanted to know if it was its own country or not. The children in the Verity study said they used Wikipedia almost exclusively on their tablets, sometimes while playing video games on their primary monitor and streaming Twitch on their secondary monitor.

Child #1 accessed one Flash game for 30 minutes. The other children in the >11 group had similarly low Flash use. This strongly contrasts with the use of Flash games by children 11 and younger as will be seen later in this chapter.

Skype ran in the background over 50% of the time the computer, roughly half the time the younger children used it. Skype was the active program in the older children group for only a little over an hour during the study. Verity logs indicate the majority of this time was spent helping a friend fix a PC problem and to show grandparents how to use Skype. Skype was used to talk to friends regardless of what game they were playing, or even if they were playing a game at all. Often a friend would be playing World of Warcraft while another was playing League of Legends, contrasting with the younger children who almost always used Skype while playing together in the same game.

Child #1 Number of times Chrome accessed

Wikipedia, 24

Flash Game, 1

Twitch, 38

Youtube, 171

Search, 359
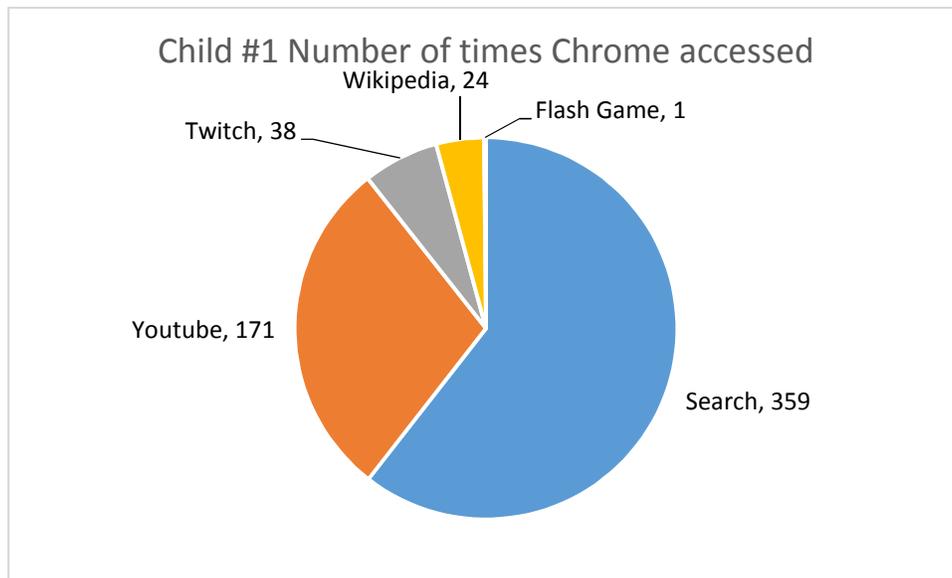
Figure 12. Child #1 number of times Chrome accessed

Child #1 Chrome Accessed. Child #1 searched Google 359 times (Figure 12) over 2 weeks. The searches, and corresponding reading of the answers to the searches, tended to last less than a minute on initial use. They were conducted with specificity and purpose. Browse of the internet on the PC was limited almost exclusively to YouTube. Verity indicated Google searches were for tips and tricks for League of Legends, modding and hacking games, reviews of current games and news about upcoming games. Nearly a 1/3rd of the searches were on Google.JP for Child #1 as this allowed practicing typing and brows in a foreign language. Child #1 stated many of the searches were opened in a new tab, thereby allowing leisurely reading of the material while watching a Twitch stream on a secondary monitor. Such activity was not able to be captured by Verity as discussed in the methods section. This means that likely all users in this age group spent more than 1 minute per page but exactly how much time is unknowable in this study.

The older than 11 group spent almost 7 hours a week watching Twitch when it was the primary activity. Passively streaming Twitch while using another software package happened over 50% of the time. Child #1 used Twitch 38 times. The active use of Twitch was for an average of over 10 minutes per view, with many of these viewings being up to 20 minutes in length, the latter coinciding with the length of many League of Legends games. Child #1 explained that active-use Twitch was for studying it like a professional athlete analyzes game footage. Sometimes Child #1 would watch just one character during a game to the extent which team won was unknown to the viewer. Twitch is viewed in these scenarios as a tool to improve their skills as a gamer as Twitch offers views of the best players and their strategies in ways that no other medium can convey. However, this age group's passive use of Twitch, when streaming content to a secondary monitor while doing something else in a primary monitor, was to their estimation about half of the time they were on their PC, a prediction Verity confirmed. Though the exact hours are unknowable because of limitations of Verity, streaming Twitch content, replete with audio commentary, is a very large component of the 12 years and older PC users. And a strikingly different use of PCs than the younger children who almost never used Twitch.

Child #1 spent 30 minutes using Wikipedia involving 24 specific searches during the Verity monitoring period. Wikipedia was used to understand high level concepts (Wiccans), to look up various locations in the world (Singapore), and to understand what various medieval arms and armor were (Bec de Corbin, Guisarme, banded mail). Most of the Wikipedia reading began as Google searches. Like the Google searches referenced

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earlier many of the Wikipedia articles were opened as their own tabs for later review. Children in this age group stated Wikipedia and Google were used viewed on tablets, and were conveniently used to quickly look up a definition of a word or some other curiosity had while reading or watching a video. The participants often used their tablet to look up information on Wikipedia even though they were at their PC.

Child #2 Hours of Gameplay

Diablo 3, 2
Skype, 2
Realm of the Mad God, 6
All other software, 1
Roblox, [VALUE]
League of Legends, 20
Flash Games and Internet, [VALUE]
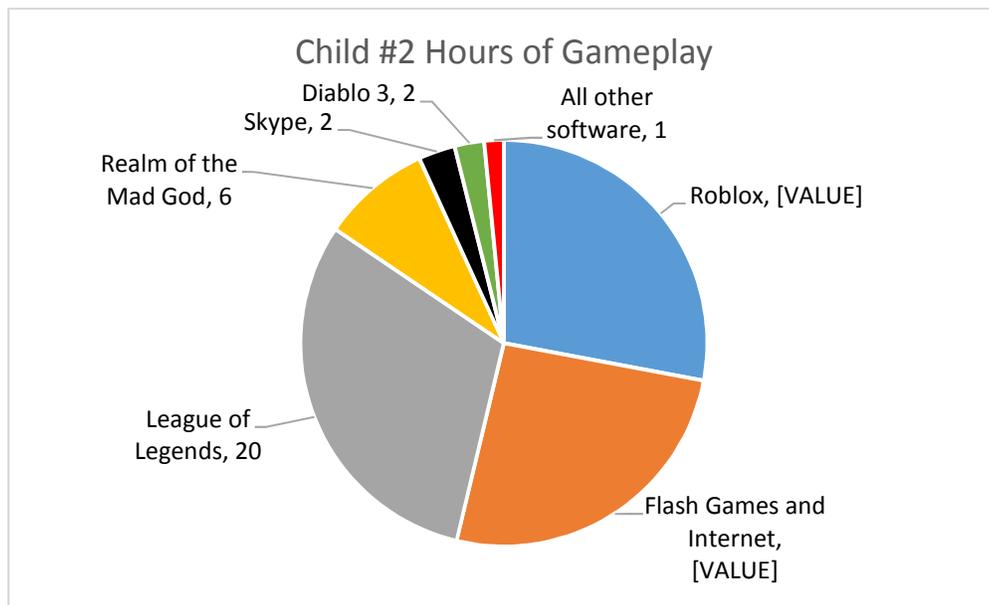
Figure 13. Child #2 Number of PC use hours

Child #2 PC Usage. Child #2's Verity logs will be used as a representation for the 2 younger than 12 year old Verity participants. Child #2 spent 66 hours (Figure 13), nearly less than half the time of the >11 year old group's average of over 120 hours, using a PC. The young children averaged using a PC nearly 5 hours a day. Nearly 1/3rd (20 hours) of the total time was spent playing League of Legends.

Child #2 spent 38 hours playing Flash games. Adobe Flash is a popular software used to write games that are played via internet browsers. Roblox was the game played the longest, followed by Realm of the Mad God. In Figure 13, the 18 hours of Chrome

usage contains within it 14.4 hours of Flash game play that does not include the Flash games Roblox and Realm of the Mad God.

Child #2 had Skype running in the background nearly every minute the PC was on. The under 12 year old group used Skype as an active window double that of the greater than 12 year old group, 2 hours to 1 hour. In addition, Skype was running passively nearly 100% of the time the PC was on, allowing the under-12 group to communicate with their friends, few of which owned iPods, tablets or smartphones. When Skype was the active screen Verity screenshots indicate Skype was used in desktop sharing mode to remotely troubleshoot a mod gone awry and to determine why a game hack wasn't working. Skype was also used to send and receive mod files for Realm of the Mad God.

The under-12 group nearly always played games with their friends. Illustratively, Jane says of her 9 year old,

> "David rarely is playing a game alone. He is always laughing, and giggling, and talking and getting very animated about the games he is playing. It is just like when his friends spend the night and they play the Xbox or Wii U, only on his computer his friends can be 20 miles away. Their conversation is always about the game being played, about how cool an item was found, or how close to dying a boss is."

The younger (<12) children in the Verity study spent their time playing Flash games such as Realm of the Mad God or RoBlox. The younger children tried numerous other Flash games besides their favorites. Flash games require no downloading or

installation, one simply visits the game's website and begins playing. The games are typically quick to learn but hard to master. Many of today's Flash games offer multiplayer such that when one child discovers a fun game they would Skype the link to their friends who jump into the new game and try it out. Flash games are not resource intensive which works out great for the younger children who, in every family in the overall study, relied on hand-me-down older, slower computers.

The older children (>11) did not play Flash games with any regularity. Instead they continuously went back to their favorite games, be it League of Legend, World of Warcraft or Minecraft. The bulk of their gaming hours were spent playing one game, contrasted with the younger users, who played two (or more) Flash games consistently and then dabbled with many more. The older children used Skype as a socialization tool often while they and their friends played separate games. The younger children used Skype while playing the same game together. It was rare for the younger children to be talking to each other and not be playing the same game at the same time.
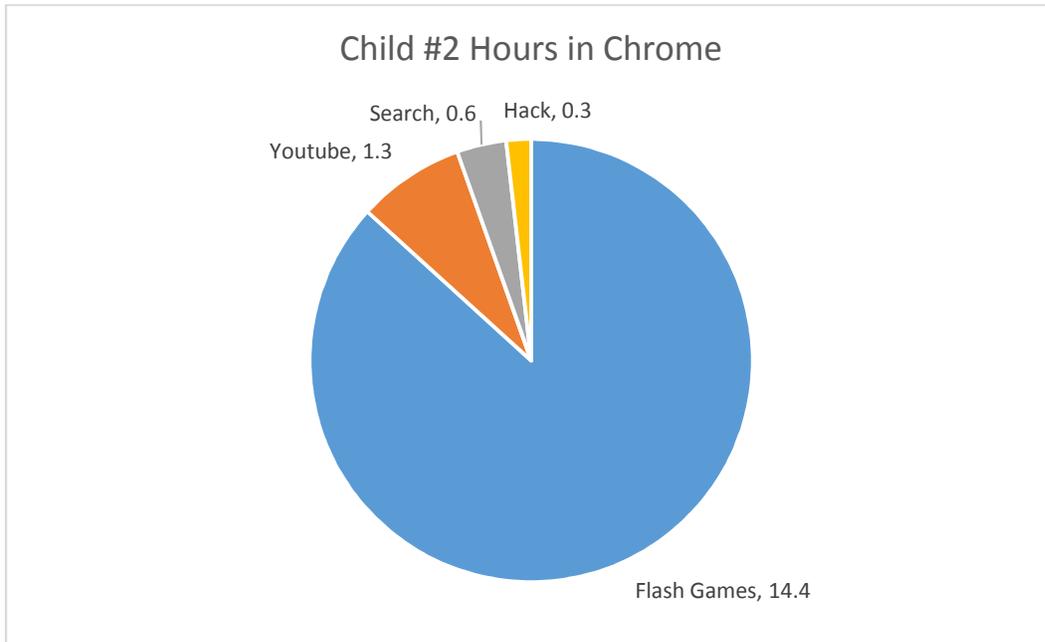
Figure 14. Child #2 Chrome usage in hours

Child #2 Browser Usage. Child #2's use of Chrome was substantially different

than that of Child #1's, and the differences are representative of the differing ways the

differing age groups use PCs. Whereas Child #1 spent a total of 30 minutes one time on

a Flash game Child #2 spent 89% of the time playing Flash games. Fathers in the study

universally derided Flash games, saying they led to needless stress on the part of their

young children because many Flash games are not coded robustly. They, being free

games often built by enthusiasts, lack the quality assurance of a purchased title, typically

lack the finely tuned controls of a professional software title, and often have broken

stages, incomplete in-game stories and missing features. Young children, used to playing

"complete" games on their handhelds, consoles and professionally developed PC games,

often expressed intense emotion, usually frustration and anger, at Flash games. Only the

most polished of Flash games garnered the most play (Realm of the Mad Gods, Roblox) but enough time was spent playing other Flash games, learning which ones were good, that angst and frustration occurred that required the fathers to explain it "wasn't the child was bad at playing games, it was the games were poorly coded". The older children, rather than become frustrated, were quick to use Cheat Engine to resolve any problems they had with Flash Games.

Child #2 spent an hour and 20 minutes watching YouTube videos (Figure 14).
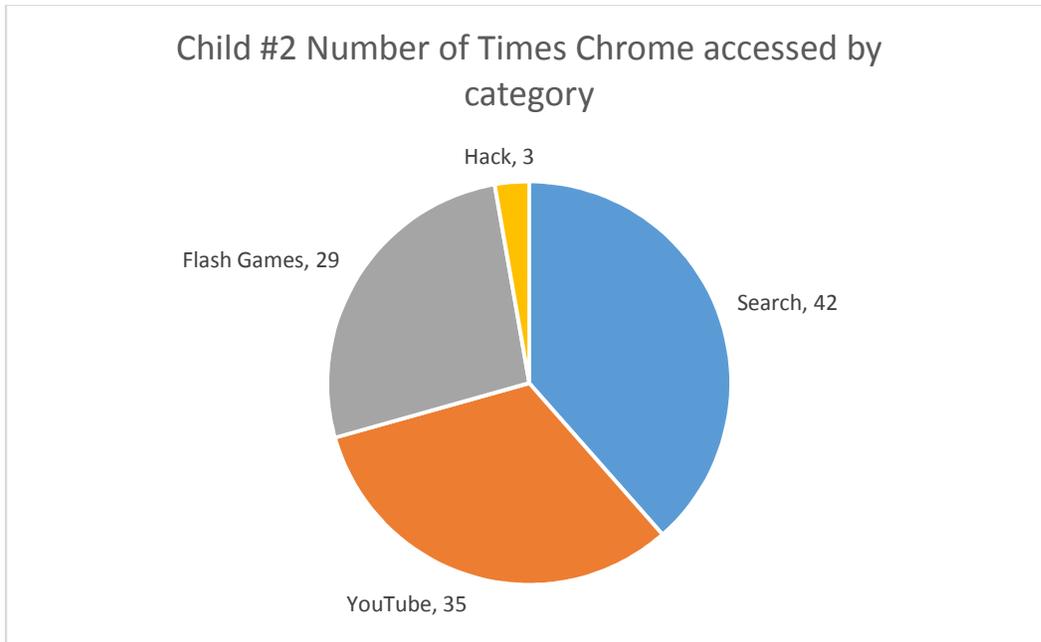
Figure 15. Child #2 Chrome access counts by category

Child #2 used search engines a total of 42 times for slightly over 30 minutes in total (Figure 15). The searches were for hacks, mods and to learn how to beat certain game bosses. Many of the searches ended in sites that the browser's security software deemed unsafe. In talking to the younger children about their use of websites they said they would visit a site and, within seconds, if they didn't see the specific mod tool or

hack file being sought they would move on to the next site. However, when they did find a site that had the files they sought they would spend ~10 minutes reading and downloading information as hacks and mods often required specific sets of instructions to properly implement. Overall the younger children rarely used search engines on their desktops.

Child #2's YouTube use was similar to other <12 year olds in the study. Child #2 watched each video for an average of over 2 minutes and, like Child #1, often used the suggested links to find peruse additional videos. Other than YouTube Child #2 did not browse the internet, rather it was for specific video game related searches.

Child #2 spent 14.4 hours playing games across 29 Flash sites, with an average of 30 minutes per game spent trying the new Flash games. None of these new Flash games were played for more than an hour and this pattern was observed in the other less than 12 year old Verity participant. Like Child #1, Child #2 has favorite games, in Child #2's case Roblox and Realm of the Mad God, which occupied the majority of the time on the PC during the study period.

Non-PC Usage

Many of the Verity participants possess iPads, laptops and tablets. They also have access to numerous different console systems that can access the internet and stream video content. Each Verity participant owns various handhelds game systems. All of the older group owned a smartphone.

Mobile Use. During the Verity monitoring period handheld gaming systems and laptops were used during road trips that took the family outside the city limits. The

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participants in both age groups spent ~2 hours playing handheld gaming systems during

their trips according to their parents. Each used their laptops ~1 hour in total while in

hotel rooms.   The handheld systems were never used at home as the children preferred

their PCs. When asked why participants responded that their keyboards, mice and

monitors allow for a superior experience. External keyboards and mice were "big deals"

as when study participants took laptops to friends' houses they took their keyboard and

mouse with them to use in place of those integrated into the laptop.

Console Use. During the Verity monitoring period console gaming systems were

used during sleepovers and play dates. Multiplayer games Castle Crashers and Spelunky

on the Xbox 360 and Super Smash Brothers Brawl Melee on the Wii U were the only

games played. Participants spent approximately 4 hours playing console games during

the study period.

Television and Streaming Video. None of the children watched television

during the Verity study period. They did use the television as a video game monitor for

the Xbox 360 and Wii U. The only videos streamed were via YouTube on their desktops

and, primarily, tablets. The consoles were used strictly to play video games.

Tablet Use. Child #2 spent approximately 2 hours during the study period

playing Bejeweled Blitz on an iPad. Child #1 did not use the iPad at all for playing

games during the study period. However, Child #1 used an Android tablet for at least 12

hours, and likely more, during the period. Child #1 used the tablet to read Yahoo news

every morning before getting out of bed and every night before going to bed. It was also

used it to visit joke and funny video sites. The other Verity participants had similar usage

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of tablets with the younger children not using them much while the older ones used them quite often. Smartphone use was typically directed towards social media for the older children, the total amount of hours spent using them for this purpose was not able to be accurately tracked.

Usage Totals

Child #1's total usage during the 14 day study period was 126 hours on the PC, 12(+) on the tablet, 2 on the handheld, 1 on the laptop and 4 on the console for a total of 145(+) hours over 17 days. This equates to slightly over 8 hours a day. Child #2's total was 75 hours over 14 days or slightly over 5 hours a day. The other children in the Verity study had similar usages to their age group peers, all falling within 10 hours of each other.

The Verity logs do not capture the amount of time the parents spent looking up facts and figures with the children using the parents' mobile devices. Car rides and meals invariably saw the use of a smart phone or iPad to answer a question that would come up. Being unaware of the phenomenon I had not built any provisions into tracking this behavior. In an attempt to quantify the time parents-children spend using technology together my wife and I tracked our own use of our portable internet devices over a 2 week period and discovered we physically use such devices nearly 3 hours a week just to answer questions, watch videos of how things work, what something looks like, etc. It is unknown if other families in the study have similar usage patterns but I suspect strong similarities exist across the study participant families.

Child #1 used his desktop as a tool to improve his video gaming skills. Searches and Twitch primarily centered on League of Legends. Child #1 used the cmputer secondarily as a socialization tool, Skyping with friends while playing League of Legends either with friends or simply conversing with friends who were all playing different games. Child #2 used the desktop primarily as a socialization tool rarely using the PC without interacting via Skype with a friend in the same game. Much of Child #2's pleasure in playing the video games derived from interacting with friends.

Computer Regulation

The mothers in the study typically intervened in the use of technology when they would reach a frustration point.

After what was perceived as an inordinately long playing session Jane would think, "Shouldn't the kids be doing something else? All they want to do is play their games. I don't know if they would ever stop!"

Leeza would work to change what her children would do at times. "We never imposed time limits but if you notice they have been on it for 18 hours straight and their eyeballs need a break, video games and TV watching if they start to interfere with things we do as family, chores, pets, then we need to stop it for a while."

Jack also would intervene when he felt the children had been playing for too long, "We don't put time constraints but we'll watch and say it has been a long time. They are pretty good about it. We've seen other families where their kids only do video games, I don't want them to do that. Some days they will spend all day doing video games but wasn't spend a weekend doing it."

Janice also participated in occasional regulation of her children's use of the internet, "Aaron's job is technology. My job is technology. Entertainment is technology. There are concerns about the physical aspects of too much technology but we don't do anything about it. How does it impact the eyes, the brain, how much sleep you get. There are concerns while I know we learn and rely on this stuff for work and for entertainment the more you do of that the less you are doing of other things so you are getting exposed to less things in life and I think there is a level that are addicting. The more I'm on Facebook the more I'm on Facebook. As soon as I start looking at it I keep it going. I am addicted to deleting the garbage email."

Other mothers in the study also had internal limits that they could not abide their children playing longer than. Kendra would tell her children, "You guys are on a play date 7 days a week thanks to Skype" and ask them to do something else. Mrs. Andes enforced actual activity in her home, "I have a requirement they do an hour of PE every day.

When told their children were averaging over 8 hours a day on computers the mothers in the Verity study were unhappy but not surprised. Jane summed up a universal response from the mothers in the study, "If they were in school they would be like my schooled friends sitting for 7 hours at school, then coming home and doing homework for another 2 hours, then playing video games for another 4 hours so I think sitting only 8 hours is better than 13!"

Overview of Technology Usage by Age

12 year olds and older. The children 12 years and older spent the majority of their gaming time playing on desktop PCs and consoles. Desktop games consisted almost exclusively of League of Legends and World of Warcraft, two highly social games, the former involving participation on a team, the latter a game played with guild-mates who team up to defeat tough enemies known as bosses. In both games children used Skype to communicate with friends they knew rather than having to type on a keyboard. Parents were adamant their children communicate only with people who were "known", friends of friends had to be vetted by the parents before allowing them to Skype. In cases where they were unable to confirm the identities of their teammates the participants were not dissuaded in playing the social games, they simply moved to using their keyboard full time to communicate.

When the children were not playing League of Legend or World of Warcraft, games with the ability to be played single-player or multi-player, like Diablo 3, were played. Interestingly, the children did not play with each other in these games, the reason being they had already established their characters on different servers and none were willing to "relocate" to play with one other. Diablo 3, though built as a multi-player game, has a robust single player component that does not reward players for playing in multi-player games, unlike World of Warcraft who's best content and items can only be experienced in multi-player mode. As such participants played Diablo 3 concurrently, but on different servers, while Skyping with each other about what they were finding, combatting and experiencing.

Skype is an integral part of the overall experience for the participants. It allows them to carry on conversations while playing separate, or the same, games. It provides the ability to share screens for tips/tricks/help, take control of one another's computers for intricate installation and configuration work, and possesses full video for the (rare) occasions children wanted to actually see each other. Often the video was disabled by the parents. Anecdotal feedback by late teenagers suggests such restrictions loosen as the child ages. All of the Verity participants PC usage happened on their own machines in their own bedrooms.

11 year olds and younger. The 11 year olds and younger spent the majority of their time playing Flash games with their friends. In all participants Realm of the Mad Gods was the preferred game of choice Roblox being popular as well. The younger children were far more likely to give new games a try. They used Skype to interact with each other while playing Realm of the Mad God with their friends, rarely did they Skype while playing different games than their friends, or playing in different parts of the same game. Parents were heavily involved in this group's use of the internet with each of the children having computers located in communal places, typically located next to their mother's desk.

By age 9, and likely younger, all of the children in the overall study were fluent in modern technology. I observed the youngest children using mod and hack tools, some rather sophisticated, both for creative/building purposes and for the more traditional use of hack tools to modify a game client-side to obtain better in-game weapons, armor, equipment, power-ups and points. Some of these tools required hexadecimal

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modifications and the youngest children were fearless in their tinkering with the innards

of a game's code. The children all knew how to patch their machines, to downgrade to

older versions of specific games and software in order to use certain mod and hack tools,

and to physically modify a machines such as add additional memory. The older children

were capable of building their own machines from components including sorting out

audio and video driver conflicts, USB issues and other technical challenges. When any

age child encountered a problem they couldn't resolve on their own they visited YouTube

first. I watched a 9 year old use YouTube to discern why Terraria wouldn't launch (it

was an NVidia driver conflict). Another used YouTube to figure out how to do install a

specific complex mod for Minecraft. The participants had a network of friends they

would reach out to, usually via Skype, and in some scenarios shares their desktop so their

friends could see firsthand an issues and provide suggestions. I observed children daisy-

chain their sharing so multiple friends were recruited to solve specific issues.

<div align="center">**Filtering and Content Restriction**</div>

Hardware firewalls and anti-virus software were in place at every home.

Numerous fathers (in all families in this study the father maintained the technology in the

home) spoke of using "netnanny" software only to be frustrated with the amount of

content the software blocked and the hiccoughs typically associated with such software

such as slower performance and responsiveness and occasional unexplained software

hangs and crashes. No household in my study used monitoring or supervising software.

Other than checking Chrome and Explorer history logs on rare occasions the parents

relied solely upon their relationships with, and trust in, their children to keep the

<div align="center">110</div>

networks safe. This deep trust in their children was an example of unschooled parenting style that was present in every home.

Radical Unschoolers claim to provide no restrictions to their children's use of technology whatsoever. Martin (2009) argues any form of restriction is inappropriate and violates a child's agency. Every family in my study, including my own, struggles with how to balance the use of technology, especially video games, with the premise of giving children freedom. None in the study believe that unlimited access to technology is the "right" answer.

Parents struggled less with the kinds of games the children played (providing they were not ultraviolent) and more with the amount of time individual games were played. Each of the families provided examples of their children learning from the games they were playing. The Jones parents stated their youngest son learned to read because of his love for video games and his frustration that his parents and older brother weren't always around to read the screens to him. Others (Ball, Damahat, Andes) touted video games' ability to teach math and money concepts. Numerous games have historical and literary ties and references that led children to research diverse topics such as Greek gods, ancient civilizations, weapons (ancient and modern), and various religions and monarchies.

<div align="center">**Different Devices for Different Tasks**</div>

All of the devices the children owned were able to play games and access the internet. Observations and analysis revealed a pattern of specific devices being used almost exclusively for specific tasks. Desktops were used almost exclusively for gaming and content creation. Tablets were used primarily to browse the internet. Social media

was almost exclusively accessed on smartphones and iPods. Smartphones were also the primary device used to access facts and figures when away from home. Handheld game systems were used only for gaming while consoles were used primarily for streaming videos. Laptops were used for gaming, content creation and social media.

The handheld gaming systems, owned by everyone under 15 years old in this study, were used almost entirely for recreational multi-player gaming in areas where internet access was limited such as park days and car rides. Despite having internet capability I never observed a handheld device being used to access the internet. The children said that, other than to patch video games, they did not use the internet capabilities of their handheld devices. Handheld systems served as instant creators of common ground when children met new children, especially schooled children. This behavior was observed at in-home playdates, sleepovers and birthday parties where schooled, homeschooled and unschooled children mixed. The universal language of video games meant the children in this study, regardless of educational, ethnic, religious or socioeconomic background, had a shared cultural reference that facilitated the start of conversations with individuals with whom they may otherwise not have much in common.

15 of the 19 participants owned their own laptops. These Windows based machines were used to play a variety of games, nearly all of them of the online, multi-player genre. Skype was installed on all of the laptops and was used by all participants to communicate with their friends, primarily when playing games. Though each laptop possessed a camera the children said they never used them, many pragmatically stating,

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as did Ben they, "…didn't like slowing the bandwidth down with needless video". The cameras were used mostly for their built-in microphones.

I assert iPods functionally act as smartphones for the younger (N<12) participants in the study. Both smartphones and iPods are capable of accessing the internet via wireless connectivity. The younger children with smartphones said the phone and text capabilities were "for emergencies" and rarely used their 3G+ data plans to surf the internet, instead relying on hotspots to power tablets for their internet needs. With teenagers the smartphone transitions from being a portable game machine with the ability to make a call only in emergencies to an indispensable component of their lives. All of the teens in the study stated they used their smartphones to keep up with their friends via texting and to monitor social media feeds. The smartphone was used to look up facts and figures when needed, but only when tablets were not available. The phone was always at hand and fast enough to deliver content when, say, driving. Younger children rarely engaged in internet searches without parental assistance. Jane states, "David usually has me watching when he looks things up" and all of the children in the study were proficient, if not technically superior, in operating their parents' mobile devices.

Tablets, defined herein as android devices and iPads, were the preferred medium for browsing the internet. Tablet owners used them to play casual and asynchronous multiplayer games but, in interviews, and personal observation, tablets were observed mostly being used as internet browsing devices. The participants said this was due to their portability and large screen when compared to their phone. Social media sites like Twitter and Facebook do not much benefit from the larger screens and additional

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processing power a tablet offers so, though the tablets were used to access such social media sites, the teens in the study stated they preferred using their phones for such tasks.

Console gaming systems, with their 100% household penetration and ability to stream videos to the largest screen in the home, were often used by families to binge on Netflix more than for playing games in all households. Console gaming was typically reserved for playdates and sleepovers, but even during those events streaming video to watch movies was often observed. All of the consoles systems owned had motion capability, Xbox Kinect, Sony Motion and Wiimotes, yet no households provided examples of children playing motion driven games. Voice activation features available on the consoles were not used either. Many mothers expressed disappointment that the children didn't play active motion games like dance games. The mothers said that on games where the option existed to use the player's body as a controller the children always chose to use the traditional wireless controls and remain seated during play.

All families stated technology on road trips was indispensable. The parents reminisced how, when the children were young, everyone talked, sang, told stories and interacted with one another. As the children grew older portable DVDs, handheld gaming systems and laptops began accompanying them. Once the youngest child in a family turned 10 everyone was bringing their own tablet, laptop, handheld game system and/or smartphone. The parents universally lamented that road trips were better when the children were younger because everyone was more interactive, more communicative. More living and more learning was being done. However, all of the parents agreed long trips are much easier with the addition of distracting technology. They also lauded

smartphones for the ability to answer questions such as how do water towers work, why are there tires on top of the trailers on the Indian Reservations in northern Arizona, what a mountain's name is, etc. When children asked questions the ability to answer, and then have a discussion, was of extreme importance to parents.

Creation and Consumption

Analysis of unschoolers use of technology resulted in my identification of two broad usage categories of technology use: creation and consumption. Different hardware form factors lent themselves preferentially to one type or another.

Creation involved the actual "doing" of something such as content creation as in a YouTube video, modification of software such as altering game mechanics or hardware as in physically upgrading machines. The end state being a changed, enhanced or modified product versus what was initially present. Consumption was typically passive behavior: surfing the internet, reading a blog, watching a Netflix stream or YouTube video, etc. Video game play, depending on the game, could be passively consumptive such as playing Farmville or Bejeweled Blitz, or actively consumed such as when a multi-player game required real-time communication amongst a group of friends to succeed at an in-game task.

Traditional educational software was not considered to be creation-oriented. The parents endorsed no software packages, and no parents required their children to use any educational software. Khan Academy, however, was encouraged. Khan Academy provides children the option to choose the topic they want to learn and lets them go at their pace, therefore parents considered Khan Academy, and any future sites that take this

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child-led pedagogical approach, as creation. Sites that simply provided children what amounted to an online curriculum, and did not offer the children choice, were panned and their use was almost actively discouraged by parents.

Creative actions were almost always accomplished on desktops and laptops. Their full sized keyboards, large screens with multiple monitor capability, upgradeable hardware, massive storage and tremendous processing power made them the machines of choice for modding and hacking games, as well as for using creative software such as Photoshop, PowerPoint and Word. A desktop's inherent modularity allowed modders to upgrade an older machine's hardware, enabling hand-me-down machines to remain capable of running modern software. Laptops today often ship with discrete video cards, and the upgrading of memory and hard drives has become commonplace as the prices have fallen.

Unschooling parents unanimously endorsed the creation aspects of the PC. They felt a child's use of a desktop to mod, hack, create PowerPoint presentations, photo albums, etc. were providing "better" learning than simply consuming videos or pushing buttons in a game. Despite the parents' wishes that children would spend their PC time on such creative endeavors the laptop and desktop logs indicated they were used more than 80% of the time for the consumption of video games and their related content.

Verity logs verified desktops and laptops were not typically used for information lookups that did not involve video game related queries and, in my study population, the PC was not used to browse the internet for long periods of time. Tablets were the preferred method of browser consumption by all respondents. Tablets and, when not at

home, smartphones, were used to answer questions that arose while driving or dining and, most often, it was the smartphone or tablet/iPad of the parent that was used to look up this information.

Get Answers Fast!

All of the parents in the interviews provided multiple testimonials to the power and utility of the internet for unschooling uses. Tablets and smartphones were used to look up facts and figures that would act as a catalyst for family discussions more often than not. Dining or driving invariably would lead to a question or comment from a family member that would lead to, "Well let's look that up" which resulted in discussing the finding. "Just in Time" (JIT) learning, or learning on the spot was what the McIntosh family called it. Unschooling parents in my study sought authentic, contextualized learning, as did those in studies by Kirschner (2008), Grunzke (2010), Finch (2012), Hinton (2012), and von Duyke (2013).

Technology Concerns – Balance in an Always-On World

My own household has regular "no electron" days where no technology is permitted other than air conditioning and refrigeration, both necessities in the desert of Phoenix! Lights are replaced with candles and oil lamps. All glowing rectangles are turned off. The children love and loathe no electron days for, though they initially miss their technological distractions, they do warm up to the fact that it is quite different living without technology. No electron days often end in marshmallow roasts, ghost stories, and thought experiments imaging living in the Old West, Medieval Times, or in Olduvai Gorge millions of years ago.

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My wife shares our successes, and struggles, with our no electron day experience at park days. This sometimes leads to other families trying their own no electron days experiment, to varying degrees of success. My wife wanted to see if my family could live 5 days with no computers or internet at home. The children likened it to a luxury camping trip but found it to be rougher than camping because they walked by, or slept in a room with, technology that served as a constant reminder of what they weren't getting to use. The experiment highlighted how reliant I am on instant internet access. When questions would arise instead of jumping on a tablet or a smartphone and getting an answer we would first turn to books in our home to see if an atlas, dictionary, or encyclopedia had the answer. We would write the question down if we couldn't find an answer and visit the local library, avoiding their computer terminals and instead browsing the book shelves. When electricity access returned we would then compare the answers from books with what the internet's real time answers were. My family was impressed by the speed, and volume, the internet provides, plus the number of different viewpoints, perspectives and opinions available. For straightforward fact-based questions such as what is the capital of Singapore the answers in books matched. However, a Google search on Singapore provided hyperlinks to culture, language, history, world contributions, etc. The dynamic learning content of the internet is one of the aspects that unschoolers inherently come to rely, though there was a certain charm and quaintness to browsing real books and seeing a variety of information with no relation at all to what was being sought. These viewings often led to other discussions, far afield from what was originally sought and, ultimately, no different than what browsing the internet can

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cause. Mr. Andes stated, "There are other resources. We use the technology because it is convenient but if we didn't have it we would have to go somewhere to get resources" when asked if he would choose unschooling without technology. He added, "I do like wandering around the library's shelves though."

Hours Self-Reported on Questionnaire

Male children self-reported average time of 6.3 hours a day of total technology usage. This is lower than the Verity logs observed usage of over 7 hours a day on a PC alone. Once one includes tablet, smartphone and television time the actual time spent on technology exceeds 9 hours a day, with the 12+ age group exceeding 11 hours a day. The fathers predicted their children spend 9 hours a day using technology, a near spot-on prediction. Mothers predicted 7.7 hours a day of technology use which was very close to the reality.

Male children used technology primarily for video gaming. Video game play was the number one consumer of time and bandwidth in all households and was the number one source of parental angst and concern regarding how much is too much. The households fell into two camps, those that provided near-limitless use of technology and those that attempted to balance technology use with other facets of life such as board games, sports, social events, etc.

2 Case Studies

The similarities of the 10 families in my study are striking. They all practiced attachment parenting, gentle parenting, and hold a belief in the innate curiosity of children. It is important to each family that one parent stay home full time with the

children, even if that means sacrificing a career and the additional monies a second full time income generates. The husbands nearly all work in jobs involving Information Technology and for those that do not they work in jobs that require heavy use of mathematics and technology. At least one member of each family directly had an education background, or a close family member (parent or sibling) was a teacher. The families are all middle class and above. They are fiscally conservative and view organic foods and family trips as investments in their families. They believe their children should have as happy and stress-free a childhood as possible. None of them participate in organized religion though many of the mothers identified themselves as spiritual in nature. 7 of the families knew their children were not going to attend school either before birth or before they were of school age. In all but one of the families the mother brought up the idea of unschooling and in half of the families the husbands initially resisted unschooling but all came to the conclusion that, since the children would be skipping Kindergarten, they wouldn't be missing much if unschooling didn't work out. The progress the children made convinced all of the fathers that unschooling was an acceptable form of education. All of the families are highly educated with 9 of the families having both parents with college degrees, and 11 more have graduate degrees. Nearly all of the parents were excellent public school students and most earned full scholarships to undergraduate universities. Each household contained an abundance of technology. The children began using technology at a young age and all but the youngest child in the study possessed their own PCs and handheld devices.

Case study #1 is essentially applicable to all of the families in the study. The differences between the families are primarily socioeconomic with 3 of the families being considered upper class financially. These families, aside from taking more exotic trips, Australia instead of California for example, own their own RVs, boats and dedicated off road vehicles. They have larger houses in more upscale neighborhoods, however all of the children in the study sleep in their own rooms. The upper class children still did not own designer clothes and the cars the parents drove were not premium brands. The upper class families all live well within their means just as the middle class families do.

The McIntosh family highlighted in case study # 2 shares all of the above characteristics with the exception that none of the McIntoshes, nor their family members, worked or took classes in college in the field of education. The McIntoshes came to unschooling by a non-traditional route and can be viewed as representative of families that discover unschooling after their children are in public schools. I will argue at the end of the Mcintosh case study that more parents would likely try unschooling, or some form of alternative schooling, if only they were aware of that such options existed. In the second case study I focus specifically on the events that led to the family becoming unschoolers rather than their shared characteristics with the other families.

Case Study #1. "I always knew my children wouldn't attend school. Well, not always, but in college, before I met my husband. I was working on my Master's degree in Education, I was going to be an English teacher. The more I learned the more disenchanted I became. It didn't seem like I would really be teaching anyone anything, more like I'd be managing a class and hoped they learned on their own. And this was in

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the 90s, when teachers still could 'close the door', and do things their own way compared to today."

Thus Kendra Damahat explained to me her decision to unschool. Their two car garage, gray tile roof, beige stucco walls, a cinderblock fence, and small yard with a home owners association maintaining the landscaping of the streets and nearby parks resembles any other recently constructed middle class Mesa, Arizona home. The inside is cozy, tile floors and granite countertops in the kitchen yield to carpeted hallways and a backroom with a big screen television. Children's artwork hangs on the refrigerator and framed family photos line the hallway. A half-completed children's board game occupies the front room and the sounds of children are heard long before they are seen. Her children run around the house. Jennifer, her youngest at 9 years old, bounds about, hopping and springing from couch to couch, giggling and laughing the entire time. Corvin, her 11 year old brother, runs in from the backyard, directing a hail of Nerf machinegun fire at his brother, Derek, 13, before running down the hallway. Derek and two friends, all wielding Nerf pistols, give careful chase to the well-armed Corvin. There is nothing peaceful or quiet in this household and, according to Allen, Kendra's husband, that's how they like.

Kendra and Allen met shortly after her Education graduate program. They fell in love and married two years later. While dating Allen began working in the financial division of a local IT company, "crunching numbers all day", a company he still works for 15 years later. Before children Kendra worked at the neighborhood library, coordinating read-a-thons and reading programs for young children.

When they decided to start a family they agreed Kendra should stay home during their child's early years. Allen was making enough money that, if they budgeted wisely, Kendra could stay home full time. While working at the library Kendra learned about La Leche League, a group that emphasizes the importance of breastfeeding and one that unschooling mothers often join. Once pregnant she began attending their meetings and it was there she was introduced to the ideas of attachment parenting, a methodology almost universally employed by unschooling parents. Attachment parenting espouses the benefits of breastfeeding, babywearing, bed sharing, and belief that the baby sends out signals that attentive parents, defined as those constantly around their children, learn to understand. This knowledge, such as early recognition of feeding cues, is then used to make the baby, and therefore the family, happier.

Attachment parenting, for Kendra, "felt just right". Derek, their firstborn, was worn in a baby sling everywhere Kendra went. He slept in their bed and nursed for periods of time far longer than what is typically deemed as usual. Being freed from having to work allowed Kendra to fully focus on Derek. Kendra and Allen viewed having children as a privilege and a responsibility to be treasured and wanted to give Derek as happy and stress free life as was possible. Attachment parenting was an important way the family could provide Derek with comfort and safety and minimize any stresses he may have.

When Kendra and Allen decided to have another child they agreed Kendra should remain at home. Allen says, "We crunched numbers and I told her she could stay at home for as long as she wanted to, forever being ok." Kendra says, "I knew when Derek

was born I wouldn't be going back to work, that any professional life I may have thought about pursuing would have to go on hold." Kendra continued attending La Leche Leage events and practiced attachment parenting with Corvin.

Kendra's third child, Jennifer, was born near the time Derek would normally be getting preparing to attend Kindergarten. Derek, before he was 5, knew his letters, could read simple sentences, and was good at basic addition and some subtraction. Kendra had read a John Holt book for a college class and stated his writing had always resonated with her. Facing pressures from family, especially grandparents, to send Derek to school, despite her desires otherwise, she revisited Holt and looked on the internet for alternatives to public schools. In rereading her original Holt book, and then reading more of his works, she saw how sending her child to school would undo what she had spent the last 5 years doing: providing a safe, secure, nurturing environ where Derek could explore anything he liked for as short, or long, as he wanted. She wondered what Derek would do when the teacher would tell him it was time to stop playing with blocks and move on to practicing letters, which he already knew. She wondered if the classroom would have a microscope that he could use to look at the furry bug legs he enjoyed collecting. These would not be issues if he remained at home. Kendra says that though Holt's books cover what life was like in school from the 1960s-80s, the times during which she was a student in public schools and was quite personally familiar with, it was the internet sites that alarmed her the most. Their descriptions of the goings on in the classrooms concerned her deeply. She decided she needed to talk with her husband about the possibility of keeping her children out of school, something she had never discussed with him before.

Kendra was a straight-A student and a self-described "Ubernerd. I asked for more homework. I could pass just about any test regardless of the subject, even if I hadn't studied! I played 'the game' and was rewarded with a full ride as an undergraduate." Kendra said she pursued Education in college in part because her mother and other family relatives were teachers. Teaching had a long, proud history in her family. She loved children, had personal experience with teachers in her family, and saw teaching as a way to have a career and be a mom as "you got their vacations off and the entire summer, how cool is that?" Thus her pursuit of an Education degree was, in many ways, "a foregone conclusion. But it probably shouldn't have been."

Kendra enrolled in an Education graduate program. She believed she would get her master's degree and then teach. She knew with a master's degree she would earn more money and have more options within a school district. However, it was during her graduate years that she became disenchanted with education. As she student taught she saw how the job seemed to be more about classroom management than anything else. She was unhappy to see how much the Principal and the curriculum would be dictating what she taught. The class sizes in the school district she thought she would be teaching in were over 30:1. She began to wonder how she could be an effective teacher. Her interactions with other teachers further dimmed her spirits, many telling her they had started off hoping to change the world and now they were just "hanging in there. The 'real world' of teaching wasn't like what they had learned in college." Kendra, after watching so many children not wanting to be in school to begin with, after seeing so many kids' interests being ignored out of the necessity to, "make sure they were educated

properly, it just began to wear on me. I was going to make sure my children never attended school. I didn't know what I was going to do at the time to replace school but I knew they weren't going to attend school."

Kendra's realization, long before she had children, that her children would not attend school was repeated over and over by my study participants. 7 of the mothers kept their children from attending school and all of them were adamant about their children not attending school before their children were of school age. All of these mothers were either education majors themselves, had family members who worked in education, or had positive experiences with close friends whose children did not attend school. They believed there had to be a better way to raise the children or, as one mother put it, "I certainly couldn't do worse!" Of the 3 families that did start their children in school, none of them were aware other options existed. Two of those families only discovered alternatives because of health situations. One family had a son (Librio) whose major chronic medical condition kept him out of school for nearly 3 months and would likely cause him to miss weeks at a time for the rest of his academic career. The school refused to work with the family, they wanted to hold him back a grade because of the time that was missed, and then figure out something over the summer. This led Theresa Librio to fall back on her graduate degree in Education and search for a way to homeschool, something up to that point she associated with "only fundamentalist religious people." The Librios began traditional homeschooling, replete with a curriculum and homework assignments, but it lasted only a few months as she "didn't see the point of the worksheets and the exercises, or in battling my kids to do worksheets they just didn't see

the point in." She read an article about unschooling and, within days of implementing it, the family decided it was right for them. The Andes family's oldest son experienced a severe health crisis. As convalescence neared its end he begged his parents to be homeschooled. He confessed he was weary of the bullying, the threats, the violence and what he perceived as the meanness of his teachers towards him. The parents, once made aware, met with the teachers and school officials but couldn't come to a resolution so they began a traditional homeschooling program, purchasing an online curriculum. Homeschooling, however, lasted only a month or so and then they discovered unschooling while looking for homeschooling groups to interact with. Both of their children took to unschooling immediately and they "never looked back."

Allen Damahat was a solid 'C' student in school despite his deep knowledge in some subjects. He describes his public education as such:

> "I loved history and was the guy who could explain the subject matter in great detail, I was everyone's favorite study buddy, I could name all the generals in the Civil War, talk about the battles, how the troops moved, what was going on in other parts of worlds during wars, yet I couldn't pass a test. My essay answers were too detailed, I would struggle over multiple choice because I could see many of the answers were right if you just looked at the big picture. School told me I was an average student so, by high school, an average student is what I became. It wasn't until college that I discovered I was bright! The professors appreciated my detailed answers, and I could take classes I was interested in. I

discovered finance and technology and their interactions while taking a

college class and ended up majoring in finance and going to work for an

IT company."

Allen's family also included many teachers, of which his mother was one, which

made his average grades something of an issue with the family. His mother thought he

had test-taking anxieties but said he'd just need to work through those. His father never

warmed up to his low grades, he felt Allen simply didn't apply himself. Allen wasn't a

fan of the public school system as it treated him like a "cog in a system, because I was

average no one cared, after all a C is a passing grade and I didn't give anyone much

trouble in the classroom. I was basically invisible."

When Kendra broached the topic of keeping Derek at home Allen thought it was a

great idea. In Allen's mind, "After all, what do you really learn in Kindergarten

anyway?" When 1st grade came around and Derek was flourishing, now knowing how to

read much larger works and doing 2 digit additions and subtraction in his head they

decided public school wasn't necessary. They explored Waldorf and Montessori schools

but the former were too restrictive of technology for their tastes and the latter didn't give

their children full freedom. Montessori schools have rules about when toys can be played

with (after the child is shown how to play with them) which seemed to them to take away

a child's natural exploratory desires. Kendra briefly considered homeschooling with a

curriculum but, having a teaching background, she decided the curricula that existed

weren't going to be of value to her other than "maybe as a guide or provide some ideas

about things that children of similar ages were learning." Kendra says, "Holt's works,

and the unschooling websites, plus a good dose of Gatto, he'll scare ya straight that's for sure! These all gave me the belief that we could educate our children ourselves." Allen adds, "Since Kendra was trained to be a teacher I teased her saying she would have a classroom size of no more than 3!"

None of the Damahat children have attended a day of traditional public school. They have been sporadically enrolled at Eagleridge, a homeschool enrichment program the city of Mesa offers. According to Kendra, Eagleridge attendees are primarily homeschooled and members of the Church of Latter Day Saints (Mormons) or other Christian denominations. Eagleridge acts like a college in that students pick the classes they want to take. Students attend either one or two days a week. Kindergarten through second grade classes are set up like traditional classes where the students are with the same children all day. They take units of PE, music, labs, library time and work on basic reading and math via "integrated thematic units". Third through eight graders (arranged by age criteria) pick 6 classes a semester, each 50 minutes long, from a list of classes. Some of the classes being offered in 2015 include: Music Mania! Science Explorers, Clay, Paint, Drawing & More!, Creative Technology for Kids!, P.E. Fun! And Author! Author!. In addition, the 7th and 8th graders are expected to participate in Student Council and build a yearbook for the school. The school is free and many unschooled children in my study have attended it at various times. The children in my study stated they enjoyed the college-like ability to select their classes. The fact classes were only once, or, at most, twice a week was appreciated by the children and the parents as unschoolers often have busy schedules that include archery, horseback riding, rowing, martial arts and a

host of other interests the children pursue. These interest-driven classes last rarely longer than an hour but, because the children aren't in traditional schools and one parent is always home, the classes are usually taken during the day. This makes them less crowded and typically attended by other students that are homeschoolers and unschoolers, but also makes it all but impossible to work within a traditional public school schedule. Eagleridge acknowledges this and builds their classes accordingly.

Aside from Eagleridge the Damahat children have taken free online classes via MOOCs. They claim to be heavy users of Khan Academy, especially now that Khan Academy covers more than just mathematics. Allen introduced my family to Dragonbox, a clever iOS application that teaches algebra with nary an equation. Allen says he likes to tinker with education apps of all sorts, especially math ones, as he loves math. The local unschooling community often looks to Allen for his opinions of various software packages they might consider using.

The Damahat household is loaded with organic foods. Kendra, like so many of the unschool mothers I met, is strongly against GMO (Genetically Modified Organisms) foods and insists the family eat organic foods whenever possible. Though I didn't take an exact inventory of what foods were in their pantry I couldn't help but notice the "organic" labels everywhere. In all of the houses I conducted interviews in organic food was the norm. In taking stock of my own refrigerator's contents I saw it was a veritable 'O'-asis: eggs, milk, butter, apples, spinach, carrots, lemonade, lettuce, tomatoes, catsup, chocolate chips, and more all bore organic labels. In fact, the only items that were not organic were the canned pumpkin and the bottle of grenadine. According to my wife

they were "out of organic canned pumpkin" when I commented on this. She is now looking for organic grenadine.

Healthy, natural foods are an important shared characteristic of unschooling families. Along with natural foods the mothers purchase, or make, natural soaps, shampoos, cleaning agents. Even dog food was preferred to be organic or all natural, with some of the mothers making actual meals for the dogs. Homeopathic remedies are a given to be tried first in every family I interviewed. Every park day at some point involved deep discussions about homeopathic remedies, what oil or herb was appropriate to address bee stings, pollen allergies, sunburns or any other ailment. Organic predispositions were present in all unschooling families, including the three that initially started their children in public schools, they stated they had felt like "outcasts when we would attend a [public school] zoo field trip and our children were eating organic apples while the other children were eating cupcakes and cookies".

Food ways, like parenting ways, are some of the major characters that unite the unschoolers into a community of practice. I observed a mother, an infrequent park day participant, feel the need to defend her decision to give her children Hostess Cupcakes as a snack to some of the other mothers. One of the normally calm, gentle, good-natured mothers appeared to take offense at the cupcakes and made comments that were perceived as snide and rude. On other occasions first time park day mothers stated they felt immediately at home when they saw the all-organic foods and heard the mothers talking about where to buy, for example, non-pasteurized milk. One first time park day

attendee told me, "I've been looking for people like this for years! People that understand how important natural foods are. I feel like I'm at home!"

While the children were running about during the interview one of them knocked a glass over, breaking it. After he cried out in surprise, "Oh no!", quickly followed by "I'm sorry!", all of the children offered to clean up the broken glass. Kendra said, "I've got it. You guys keep playing." There was no shouting, no accusations, no anger evident. To the Damahat family it was a glass, nothing more. Kendra explains, "Children break things, they run into each other, they get hurt. That's ok. That is no reason to get mad, to go yelling at them. We are gentle parents, we discuss and move on."

Gentle parenting involves parents showing respect for their children. Allen says, "If I broke a glass, even if I was doing something stupid like juggling it, I wouldn't want to be yelled at. I treat the children the way I'd like to be treated, with respect." Karen adds, "And I know they didn't mean to break the glass, I try to look at it from their point of view, to understand how it happened. That really matters, especially in sibling issues, when they are fighting. I try to be understanding and empathic, try to figure out why they are fighting and what they are feeling. Basically like I would do with my friends."

Aspects of gentle parenting were present in all of the houses I observed. It was visible at park days, and at conferences as well. Kirschner (2008) related a story where she had been asked to present her unschool research at a local unschool conference. Her daughter was but a few months old and began crying. Kirschner, rather than shush the child, began nursing her during the talk. The crowd applauded, they considered her 'one

of them'. During the unschooling conferences I have attended the smaller children often play in the back of the room. They can be seen running up and down the empty rows even when speakers are presenting. The parents let the children play. There is no jerking the child by the arm and leading them out of the room, there is no anger, no hissed "stop it" or angry pointed fingers summoning them. Parents admit to sometimes getting short with their children, or barking at them to stop doing something, but those are the exceptions and when they were spoken of it was more as if they were confessing a sin that they had done something wrong rather than as a parent who had reached a breaking point. It clearly bothered them that they "lost it", even for a moment. One participant, Jane McIntosh tells,

> "The two [brothers] were continually bickering and I had a bad
> headache from the flu. I was so miserable and they just wouldn't stop. I
> finally yelled at them to 'Just STOP IT! Go to your rooms!' and they
> looked up totally stunned. They slunk to their rooms. I later popped my
> head in and apologized and they each told me they were sorry, they hadn't
> been respectful. And, like that, it was done. No lingering anger, no
> frustrations."

Financially the Damahats are conservative. They live off of one income. They do not spend their money on "things", their children's rooms are not loaded with collectible toys or designer clothes. They do not have the latest and greatest television. Their cars are newer but nothing ostentatious, their minivan would definitely not be considered "fancy". They live well within their means. Allen's vacation time is spent travelling

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with the family. They have taken trips to Europe and all over the United States. They don't enjoy camping so they take trips to historical places such as Civil War sites, and cultural experiences such Washington D.C., and New York City. They wait for movies to come to Netflix to watch them as a family. They eat out rarely. They purchase items from Goodwill and Savers. They volunteer at food banks and help out with causes during the holidays.

All of the middle class families in the study take a fiscally conservative approach to managing their money. All of the households had one primary wage earner, and in 9 of the 10 families studied that was the husband. In households with older children (>10) some of the mothers had begun working as home-based sales consultants for a natural oils, herbs and candles company. The money generated was not required to sustain their family but, rather, to supplement the travel fund and to give the mothers something to do other than watch the children full time. The mothers said as the children grew older they became, "more of a taxi service. My day-to-day guidance was needed less and less". The mothers with graduate degrees in marketable careers such as electrical engineering were not sure what their futures held once the children were out of the house. They were concerned that, "being out of Corporate America for 15 years may make it impossible to get a job. I don't know what I'm going to do." Yet all of them said it was more important for them to stay home and raise their children, to provide them a happy, safe, secure childhood. And, they pointed out, unless something drastic changed with their husband's income they could easily pursue volunteering opportunities, or helping with

crisis shelters or food banks, where their time and humanity was needed more than their knowledge of electrical circuits.

The Damahats still struggle with some family members not accepting their educational lifestyle choice. Allen's father and Kendra's mother never came to accept their choices, both viewing the decision "as betraying their children's education". Each of these grandparents conduct pop quizzes, and routinely test the children to see if they can do math or read long sentences. The children think this is quite funny now that they are older but, when younger, "these were often traumatic moments for them, they would leave Grandma's house thinking they were stupid. It would take weeks, if not months, to undo these thoughts! The children were almost never left alone with their grandparents." Discussions with the offending grandparent as to why this wasn't acceptable behavior never resonated with them and, according to Allen, the comments didn't stop until they had passed away.

The friction the Damahats experienced with close members of their family was present in 9 of the families in my study. It is a testament to how ingrained schooling is, almost as if it is a secular religion, one that punishes families that choose to leave the 'education church', making them targets of well-meaning relatives trying to 'save' their grandchildren, nieces and nephews. The families indicated it was hardest when their own parents wouldn't accept the decision. The participants in the study said that in most cases the family members with the most reservations softened their stance when they saw the children growing into intelligent, thoughtful, upstanding young people who could read, write, and demonstrate math skills. However this wasn't always the case and it still

didn't make up for years of mistrust and pain. A number of participants said a parent

passed away never having reconciled their educational differences. Only 1 family, the

McIntoshes, said both sides of their family were fully supportive of the decision to

unschool. Interestingly, they were the only family in the study who did not have family

members involved in the field of education.

The Damahats do not participate in religion, organized or otherwise. The children

are aware of modern religions and view them as no more factual than the Greek

mythologies. The Damahats, despite both being raised in religious (Catholic)

households, view religion as a guide to living, not as actual Gospel to be followed. They

both attributed many of the world's problems to organized religion. Kendra says she is

spiritual, that she believes in the power of nature and the universe, but, "what that means

I have no idea. I do not have faith in any sort of organized religion. This caused

problems with my parents and we always have to remind the children to be respectful of

my family's religious views."

None of the 10 families in the study attended church or participated in any form

of organized religion. Some fathers joked "Sunday is for football!" and others suggested

"the weekends are meant for being outdoors". One park day member is raising her

children to be Jewish, but in a cultural, not religious sense.   Many of the fathers in the

interview were openly disdainful of religion and their children mirrored these sentiments.

At park days many of the mothers openly discuss a Goddess, they have solstice parties

and spiritual moonlight mother-sonly gatherings. Some park day attendees say they

belong to the Unitarian Universalists (UU), a belief that essentially states everyone has their own religious experiences and beliefs.

Religion, however, can be divisive even among those that state they are not religious. One park day a mother insisted she was atheist and that Rainbow Rhythm's charter has a line that offended her, "We believe that our personal spirituality is a unique expression and we can all learn from each other's experiences." She said it was offensive to her that the group included 'spirituality' and that they needed to remove the word from the website. This dispute spilled over to the listserv and ultimately led to a handful of mothers quitting Rainbow Rhythm and forming their own park day group, one that made no mention of spirituality on their website. Ever pragmatic, many of the Rainbow Rhythm mothers believed this was a good thing because now there were at least 2 park days a week. Outside of the offended atheist and 2 of her friends, and the 2 women that were staunch defenders of keeping spirituality in the group's description, none of the other mothers seemed to care. They felt both sides were, as Jane put it, "overreacting and being silly. Both sides said they were trying to show their children that it was important to stand up for your beliefs but all the drama was unnecessary".

Case Study #2. Ben McIntosh started Kindergarten already knowing his letters and some basic math. His parents had read nightly to him since birth. When Ben would show an interest in something they would facilitate it in any way possible. Ben's train phase resulted in the family taking train rides in northern Arizona and California. His fire truck phase led to membership to the Hall of Flame, a local fire truck museum, and multiple firehouse visits.

Brooks McIntosh thought it was important that Ben start school early so at 4 years old Ben found himself in half day Kindergarten. Brooks, from the very beginning, made sure Ben was well prepared for any tests that might arise. He worked nightly with Ben on anything they covered during the day in school. As 1st grade came Brooks made sure he was involved in his child's mastery of facts, that Ben had everything memorized before returning to school the next day. Brooks' goal was to make sure Ben treated school like the video games they both enjoyed playing together, that Ben would get the high score on every assignment, just as Brooks had done as a child. Ben, however, didn't necessarily feel school was as important.

Ben was an easy going child, he didn't make waves or intentionally make himself stand out. Teachers loved him because he followed instructions, was well prepared, and always had his homework done. By 3rd grade Jane was told Ben was "as a bright child, so we transferred him to a more rigorous Academy. Brooks, in particular, believed Ben would be best benefitted if he attended schools that gave him more of a challenge, one that kept him busy. Brooks would then go to work and leave me with the pieces, the fighting over homework, the getting him to read the books the school wanted him to read. Ben just wanted to read the books he wanted to read, which were way more advanced than anything the school was letting him read, but that wasn't an option. The Academy began piling on the homework. By the end of 3rd grade we were at 2 hours a night!"

Brooks, however, looked at it has his parental duty to make sure Ben scored the highest grades in the class, "I'd quiz him mercilessly, if the assignment said to complete the worksheet in 2 minutes I'd secretly move the clock to 90 seconds, to really push him.

Many times he cried. He'd get so upset. But then he'd get the high score, he'd get praise from the teachers, I'd buy him an ice cream cone, the class would be amazed at his grades, I'd tell him to trust me, it'll all be worth it in the long run. I wasn't there to see him every day though because of my work, so I didn't notice the change that was happening to him."

Jane continues, "Ben was becoming more and more apathetic. The love of learning that he had before Kindergarten had been slowly evaporating and, by the end of 3rd grade, I just didn't like what I was seeing. The school praised him for his smarts, his test taking skills, they said his standardized test scores were amazing. He was an absolute delight in class, following rules to the letter. We kept him in public schools instead of move him to a more rigorous private school because each of us had attended and we thought it important that he get exposure to other types of kids. The reality was that wasn't even happening, in the Academy the only minorities were Asian children and there were no poor kids. It was like a private school."

Each summer Ben would recharge. He'd complete school, come home, and spend as much time as he could reading the books he wanted to read and playing games. By 4th grade Ben was quite handy with computers, his father had taught him lots of tips and tricks about how to build them, component by component, how to install software, how to play with the system settings. It was obvious when we talked about technology that Ben felt very comfortable with computers.

By 4th grade their second son, David, was going to be starting Kindergarten. The Academy had a half day Kindergarten class that David was going to attend. Ben,

however, was not looking forward to school. Jane remembers, "I think he knew that there was no end in sight. More homework, more tests, more quizzes. In 4th grade Honors English the teacher said the children were expected to write one hour every night. Some nights Ben had 3 hours of homework. When Brooks would be around he would continue making sure Ben knew the multiplication tables faster than anyone, that he could do division in his head. Brooks taught him all kinds of math tips and tricks to make Ben succeed in school. That year, though, I carefully watched what school did to David. He loved to run and jump and play like all rambunctious boys. He was bright as well, he could read and do math better than Ben could when he started Kindergarten and, candidly, we hadn't spent as much time practicing these things like we had with Ben. By the end of the second month I started thinking we had to do something, especially for Ben."

They showed me an example of the homework that was expected of Ben every night. I was astounded, it was more than I experienced in college! Reading assignments, writing assignments, math homework, art assignments, it was incredible. Brooks laments, "Ben would have so much homework that it was a given that Sunday night was a homework night. School had severely impinged upon our family time, and never more so than in 4th grade." Jane and Brooks met with the teacher and she said, "That's the way it is nowadays, the best schools give the most homework to make sure the kids get the highest scores and learn the most."

By now even Brooks was seeing the change in Ben. Ben was not excited about school, or about much of anything. He did as he was told. Brooks describes it this way,

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"Ben used to be super creative and now, now he'd wait to be told what to be creative about. And then he'd need to know what elements to include in the creativity. Somewhere along the way he had changed, and not for the better."

Jane began researching alternatives. She had been part of the La Leche League and had heard about "these schools that sounded whacky, ones that didn't have grades, others that let the kids do what they want. I was interested but Brooks, he'd say those people were crazy", to which Brooks adds, "I have a Master's degree, I have been in school for many years, I'm a smart guy, and yet I've never heard of any of these schools producing good students. Nowhere in my education was I ever exposed to any other way other than 'public school' or 'private school'. Homeschool is what religious fundamentalists do, the ones that deny evolution and say the earth is 6,000 years old! Jane gave me some websites to read, she had me read Holt and Gatto and Kohn. I started thinking maybe there is another way…"

Ben didn't finish the 4th grade, his parents removed him during the holidays and, as Jane says, "we just let him be. I had read about deschooling so I figured he'd need at least three and a half months to get school out of his system. It didn't take him quite that long before I started to see the old curious Ben come back." David enjoyed his half day class and finished out Kindergarten but never saw a school again. David, who would now be in 4th grade, reads fluently, has a natural feel for math, but, though he can write, he doesn't enjoy writing. Ben enjoys telling stories, and types quickly. He has taken numerous online classes and some community college classes.

My own experience was startlingly similar to the McIntosh family. I pushed my son to get the highest scores, to get the best grades. I taught him tips and tricks to circumvent the system, to make him more efficient. Like the McIntosh family I made sure my children were loaded with technology and that they knew how to use it. At conferences I met 2 other families who were willing to share their experiences of starting their children in public school only to ultimately leave. In both cases the children also left in the 4th grade. All 4 families that started their children in school possessed the traits listed in case study 1: the husbands worked in the IT industry, the wives were able to stay home full time with the children, organics were important components of their daily lives, they practices attachment and gentle parenting and were areligious. The families, lamented that they wished they had been given a choice, that they had been informed of other options other than the traditional school system. Those schools don't offer pamphlets advising parents of alternatives to public school. If they had it is likely these 4 families would have at least delayed sending their children to Kindergarten and 1st grade to try out an alternative education as all of the mothers in these families stated they were unhappy sending their children to Kindergarten, that they didn't see the point of sending their child away to the care of strangers for many hours every day, especially when their children had already begun learning to read and do math. If one does not have a background in education, or know someone who has unschooled, it is all but impossible to find out about it. The Google Adwords analysis in Figure 3 shows the search for "unschool" and "unschooling" has been flat for the last few years, only spiking when the

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public media outlets like Yahoo post a front page post about alternatives to traditional education.

CHAPTER 5

DISCUSSION

The families in my study were predominantly Caucasian, educated with both

parents possessing, at a minimum, a bachelor's degree, middle class and higher, the

majority of the fathers work in the IT industry and most of the mothers had a background

in education either in their personal college experience or as a profession. The parents

tended towards Libertarian political leanings with fiscally conservative viewpoints on

business and liberal societal viewpoints. None had any current formal religious

affiliation. They had small families with no more than 3 children, in my study 8 had only

2. Each home had a full time stay at home parent. The families possessed a wide array

of technologies on hand with each child possessing at least four internet accessible

devices. Though 70% of the families had children who had never attended a traditional

public school all of the children in the study have taken formal coursework, be it online,

at the Community College level or Mesa's Eagleridge Homeschool Enrichment program.

The unschooling decision was initially proposed by the mother in all but 1 case. The

mothers typically had made a decision, before they actually had children in some cases,

the remainder before their child was of school age, that their children would not be

attending public school. The families in this study possess numerous socioeconomic and

demographic similarities to unschooling populations in Boston (Kirschner, 2008) and

Utah (Hinton, 2012), though Hinton's population consisted of devout members of the

LDS church and each family possessed more than 3 children, the remaining

characteristics still applied.

The mothers in my study shop at multiple stores to purchase the right kinds of organic foods. They eschew chemicals, many making their own soap and shampoo. Many of them (N=4) work part-time out of their homes for companies that sell organic oils and scents. They avoid Genetically Modified Organisms (GMO) and purchase Free Trade food where possible. They purchase whole, unpasteurized milk. They avoid vaccines.

They are decidedly non-materialistic, they do not purchase brand name clothes or handbags even though many could easily afford to do so. The parents have decided to live off of mostly one income despite that fact the several of the mothers have advanced degrees in career oriented professions such as electrical engineering. Pannapacker (2005) wrote, "…well educated parents with secure, yet relatively medium incomes, seem to be opting for more modest lifestyles in relatively affordable regions of the country in order to homeschool their children." The parents in my study echo that sentiment, valuing time with their children and family experiences over material wealth. The mothers in particular enjoy spending vast swaths of time with their children. Stevens (2001), in his study of homeschoolers, wrote, "Time and again, parents told me that their child's self-development was worth virtually any sacrifice…careers suspended, incomes cut, houses left uncleaned or unfixed, adult social lives curtailed dramatically, all in the interest of giving more to the kids (p. 7)". They believe children have opinions and feelings that should be respected. The families in Kirschner (2008) and Hinton (2012) were also non-materialistic, emphasizing moderation, volunteerism, and fiscally conservative purchases.

The families in my study learned of unschooling by word of mouth, typically from participation in La Leche League. The writings of John Holt inspired many of the women, before they had children, to decide when they did have children they would not attend a school. Many of the mothers attended undergraduate and graduate Education programs with the thought of becoming a teacher. Once they experienced the amount of classroom management, emphasis on standardized tests, and the bureaucracy of the school system they decided education as a profession was not for them. 80% of the families had not experienced divorce and all of the families were in stable two parent marriages. Kirschner's (2008) Boston families primarily learned of unschooling by way of La Leche League and many of her participants were active teachers in La Leche League.

The fathers of the children in my study, being in the IT industry, view technology as essential to the modern world. Their homes have access to fast, wireless internet. Every child possesses multiple ways of accessing the internet at home and away. Video games are viewed as forms of learning. The parents are heavily involved in their children's daily lives. Even the mothers will play video games with the children, the fathers being former gamers themselves view the children as carrying on as they did as children. The parenting styles were universally authoritative permissive. The children were allowed to pursue their interests as far as they desired. The parents believe stress is a silent killer, that it erodes a child's confidence, and makes for miserable childhoods and miserable adult lives. If they must err it will be on the side of the non-stressful answer. Kirschner (2008), Grunzke (2010) and Hinton (2012) wrote of similar observations in

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their study groups, with Hinton and Grunzke emphasizing the prevalence, and importance, of technology in the households.

The parents in my study unanimously believe today's schools are designed to create employees and consumers who follow orders. They believe the school system looks down on blue collar vocations, artists, and free thinkers. They have declared they are ok if their children pursue their dreams instead of financial freedom for the former brings happiness while the latter leads to a permanent spot on a hamster wheel. The fathers want their children to be happy but also financially independent. Both parents are supportive of their children going to college. Or not. Grunzke's (2010) study found similar parental beliefs, as did Kirschner (2008) and Hinton (2012).

The parent-child bond is strong within all families in my study. The children respect their parents, trust their parents, and universally claim their parents are superior to parents who only focus on school, getting good grades, not being late, etc. The mothers believe in letting their growing children get enough sleep, concerns echoed by parents in Grunzek (2010) who rated it as among the most important benefits of children not attending public schools. The parents in my study discussed their beliefs that age segregation is not natural, that children are different grade levels in different subjects, and that the mixture of younger and older children playing together is far more beneficial than playing with one age group alone.

The parents want to own the responsibility of educating their children. They look at it is a gift, as a privilege. They view forced learning to be unproductive at best. The parents are not concerned about test scores. They aren't interested in grades. These

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families believe the U.S. school system acts as the religion of the nation, a way to indoctrinate children from a young age to become consumers and cogs rather than producers and free thinkers.

As von Duyke (2013) noted in her Democratic Free Schools study unschooling families have capital, both time, money and knowledge, that many families do not possess. Homeschooling is still a provenance of the religious, but, as technology improves in power while dropping in price, more and more middle class families are leaving public schools, as evidenced by Ray's (2012) assertion that close to 50% of homeschoolers are making this choice for secular reasons. School violence, large classrooms, grade stress, homework assignments and an environment where children are dating, and talking about sex at ever younger ages, homeschooling is a way to ameliorate many of those concerns. There is a continuum in homeschooling as there is in unschooling. There are teach –at-home homeschoolers and there are those that use the curriculum as a guide. In the unschooling community there are those that supplement their children's own educational interests with math workbooks and there are those, known as radical unschoolers, who believe telling a child to do something that isn't of their own volition is unfair to the child.

Gray and Riley (2013) demonstrated the children who grew up as unschoolers in the 1980s and 1990s tended to pursue jobs in the arts and sciences where they typically have a tremendous amount of autonomy. Over 90% of the respondents to their survey declared they were successful by traditional financial definitions of independent as well as by their level of happiness and satisfaction with their jobs and life.

The internet, using listervs, Facebook and other social media, allows unschooling mothers to coordinate park day meetings and group field trips. This same technology allows parents to answer questions of fact within seconds regardless of there location. The children are able to look up answers to questions they may have due to the fact they own their own technology. Children are encouraged to use technology to explore their interests. Technology allows them to watch videos, real time streams, 3D content, audio, visual, and text webpages provide seemingly limitless information. For additional conversations most websites list the email address of putative specialists. Citizen scientists today assist in academic research projects. The internet allows young children to become experts on a topic, to garner a respect that face-to-face and traditional educational means do not.

The future job market is so unpredictable that parents believe allowing children to chase their own dreams, curiosities and interests will result in self-development of skills in research, critical thinking and analysis that will transfer, should the need arise, to any kind of job need. Knowing how to find information, where to look for it, and how to evaluate it, is more important to unschooling parents than simply having them memorize the order of Presidents or state capitals.

Detractors often cite socialization as a concern but the children I observed have more active social lives than their schooled counterparts. Park days, theater, art, exploration, the children spend more time in a car than they may wish to as they drive to various events. Kirschner (2008) and Hinton (2012) note their unschooling study populations engage in active social lives as well. The internet websites and blogs run by

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unschooling parents tout, if not lament because of their need to constantly drive, the number of social activities available to their children.

To unschooling families failure is ok. The best time to fail is as a child. The children view failure as learning a way not to do something. There are no "C" students, there are no "F"ailure students. There are just children who are pursuing interests. The relaxed approach to delayed reading children, of to those that struggle with mathematics early on in their lives, is anecdotally touted by parents of older children as reasons to relax, to let the child "figure it out". The only academic study that looked at unschooled adult children, Gray and Riley (2013), concluded the children possessed adequate to excellent reading and writing skills despite never having attended formal school, with a large number of respondents indicating they had graduated from a 4 year university and many had gone on to advanced degrees.

Technology use fell into consumption and creation within my study population. The children in this study consumed massive amounts of video games, the Verity portion of the study indicating that 80% plus of their time on their PCs involved video games. Yet they often took their play experience and turned it into creation, whether it be new levels for a game or modding a game so it does something other than what the creator intended.

The children were well versed in the use of the internet to track down answers to questions. They know how to access sites like Khan Academy to solve math and science questions, various science sites and YouTube videos were used to answer questions about

life around them. Much of this learning took place in the presence of parents, and the

parents in this study displayed exceptional amounts of 1:1 time with their children.

Parents shared concerns that their children spent too much time in front of

glowing rectangles, that they did not get enough physical exercise. However, my

personal observations indicated the majority (>90%) of the children in the study were not

obese, with many being quite fit and athletic. The healthy food choices provided by the

parents must somewhat offset the sedentary experience of playing video games.

Additionally many of the children participate in physical activities be it rowing, dancing,

baseball, or archery, during the hours they are not playing video games, quote often

during the time schooled children are in desks. Many of the parents enjoy the outdoors or

sports and the families often spoke of hiking, climbing, swimming and playing games

like football and baseball. Martial arts was a common interest shared among many of the

males participants.

The families shared their frustration in the size of the Valley, how everyone is so

dispersed from one another. They felt the excessive amount of hot days curtailed many

of the children's outdoor interests. Many of the parents, though, had grown up in

snowbound winters and likened Arizona's as a reverse of what they grew up with.

All of the parents in the study attended, and graduated, from the public school

system. Nearly all were high performers within the system, straight 'A' students who

received full scholarships to universities. Many of these individuals further received full

scholarships into graduate programs. This is a group of people who would be considered

quite successful by any measure of academic standards yet they have chosen to remove their children from the very system that set them up to be where they are at today.

What best practices can public schools, the administrators, the teachers, the politicians, the business community and the like take from unschoolers? The school system could learn that, thanks to technology, rote memorization isn't particularly important. School is the only time in one's life where one works only with people one's own age. Children have real, tangible interests that, when allowed, and encouraged, to pursue can result in spectacular learnings. 99% of the material "mastered" for others in school quickly dissipates. But the material that is of personal interest, that captures one's attentions, keeps a person up deep into the night out of curiosity, that is the material that stays with an individual for years after. The stresses of school, the constant irrevocable pace of the curriculum, and the emphasis on test scores, the unschooling parents in my study would suggest these characteristics of public schools do not facilitate learning, instead they may simply keep a sprawling academic system in place.

I do not advocate all children, nor all parents, attempt to unschool. By choosing to own one's education one has no one to blame if it doesn't work out. Yet unschoolers are not looking to pass blame, they are looking to own their futures by providing their children with a bespoke education, a small classroom size, and contextualized learning with real world experiences. Some children, be it genetics or their home environment, need, and possibly flourish, with rigid academic structure. Some do not. Today, in the Land of the Free, in a country where Freedom of Choice is important, we have a one-size-fits-all public education system. The system seems to use tracking (Honors,

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Advanced, Normal, and Remedial) as an elastic waist band, one that expands for the brightest minds and contracts for those that allegedly need the most supervision. Yet the various tracking levels are flavors of the same theme: memorization, testing, grades, 7 hours in a room every day, classes that start early, homework that ends late. Children aren't allowed to be children any longer, they aren't allowed to frolic outside, to lay on the ground and just stare into space thinking about whatever they want. The unschooling families want to avoid that system for their children.

Public schools do not advertise, or advise parents, that other learning options exist. Homeschooling is not something the principal of a school, who's funding in part is tied to headcount, seems to offer up. A principal has no incentive to educate parents on various alternatives to public schooling.

Homeschooling wasn't legal in all 50 states until 1993. The children of the 1970s, when John Holt began arguing that parents should break the law and keep their children off the school's roster, today are having children of their own. What they do with their children will be telling. The first wave of unschooled children did not have the advantage the internet conveys, no tool that makes knowledge once accessible only by the teacher now available to anyone with a Wi-Fi enabled device. It is too early to know if the unschooled children will continue to propagate unschooling as a valued way of education.

The children in this study have never known a world without the internet. Soon the children will not even know a world where the internet isn't in the car, at the beach, or in the forest. Individuals do not cite the telephone, or electricity, or hot and cold

running water as revolutionary technology, they simply are, yet when one stops and thinks about them they are still monumental contributions to society, just ones taken for granted daily in the United States. The internet is approaching that level of ubiquity, if it hasn't already reached it. The Maker movement and 3D printers are a technology that stands to make massive future changes, and this is the movement today's children will grow up with. They will say, instead of "do you remember when we had a 300 baud modem and how cool that was to get onto the internet for the first time?", they'll say, "remember when you had to order spare parts online? When the 3D printers were so slow, and limited to only printing in resin?" None of the families in my study owned 3D printers but 4 of the fathers had priced them out and were waiting for them to hit the $500 mark before purchasing. I presume within 2 years fully half of the families in my study will have 3D printers at the disposal of their children. Already 2 of the families were using a community-accessible 3D printer to make items.

The children in this study spend 8-10 hours a day using technology. The families in the study repeatedly gave examples of how they would be driving, or eating a meal, and someone would ask a question which would immediately result in technology being pulled out to find the answers. Often the families would race to see who could find the information first. The answers quite often led to additional discussions. These are examples of Just In Time Learning (JIT), a concept mastered in the 1990s by manufacturing companies who wanted the delivery of products when they needed, no sooner and no later. Computer manufactures would have video cards delivered the day before, or even the day of, their actual need. This level of precision reduces, and ideally

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removes, stockpiles of parts and their resulting overhead. It relies on a trust that the operational systems in place will deliver what is needed when and frees up capital for companies to focus on other aspects of their business, such as research and development, quality control, technical support, and areas more dynamic and active than simply warehousing parts for when needed. Today's schools act as large warehouses of facts. The facts are placed in books, the books are accessed when the curriculum tells the children to look at them. It is a very static enterprise. Tremendous amounts of time are spent waiting to be able to receive the next part, the next unit in math or the next writing concept, despite the fact a child has already mastered one concept and may be ready to master many other similar concepts. Unschooling provides JIT learning. The child has no limits. The next unit is always ready.

Assessments

Parents in the study reflect the general unschooling stance of not formally assessing children. And, *prima facie*, that is the case. In none of the families that I observed, nor in the scant unschooling literature that exists, are children given formal exams. There are no pop quizzes, no spelling tests, no math worksheets, and no essay exams. There is no testing in the traditional sense. The unschooling websites and blogs emphasize the importance of not testing one's children. Unless, of course, they want to take a test, to see what one is like or to see where they would rank, then a test would be considered acceptable. However, if one broadens one's definition of what an assessment is, then I can say I have observed assessments occuring almost constantly within unschooling households.

In the case of unschoolers, though no formal assessing ever transpires, numerous covert, or "hidden", assessments take place between parents and children. I have observed, and personally carried out, assessments in board games with monetary components, such as Monopoly, Life, or Pay Day. Unschooling families often play games as a family, one could argue this character could be included with the earlier lists of shared characteristics as many of the families in my study have dedicated family game nights. The parents, and sometimes even older children, encourage a child to be the designated "banker" or money changer. Parents will ask the children, usually the youngest, to add up the dice and move them the appropriate spaces. Children are asked to read the Chance/Community Chest cards, to read aloud the rules in the case of a dispute or confusion, and to count the money and make change. Parents, and older siblings, go so far as to intentionally give odd bill amounts when buying properties, or paying bills, in games such as Monopoly and Pay Day. The children aren't told directly "you must read/count this," rather, in the spirit of the family interactions, they are casually assigned these tasks. Being asked, in a non-judgmental way, appears to empower the child, for though they presume they can say no they typically do not do so. They view game time as fun family time, where they are simply playing a game. It is rare to hear of a child refusing to participate in the game nights, or in counting currency or reading cards. As such the younger children nearly always handle the money, add up the dice, read the instructions and/or the actions of cards aloud.

The reading is observed by the parents who later discuss how well, or how poorly, a child did at the reading or math components. In my own family we observed our

youngest child excelled at grasping math concepts. We gradually introduced more and more mathematically complex games to the family game night. Never did we tacitly explain to the children why we were playing "harder" games, we simply pulled them off the shelf and started playing them. If the game wasn't fun we would go back to games we all enjoyed. If a child is found to be struggling with reading, or addition, or subtraction, parents select an easier game to build up the child's skills. Many parents admitted to playing board games, especially with their younger aged (4-8) children, for the specific purpose of seeing if their children could read or really could add and subtract. Older siblings seem to relish in testing their siblings, especially when they are playing without the parents. Typically, however, they are not subtle about their intentions. However the younger children often seem determined to prove to their older siblings they can do the math or the reading.

Real world problems such as computing miles per gallon, time to drive to a certain place if a certain speed was averaged, figuring out sales tax and the like become "games" played with children. In interviewing, and observing, the families in my study it became apparent that, at least in these families, the parents assess their children's progress in skills critical to success in today's world. Mothers spoke of how they would ask their children to help them bake, having them read the recipe, dole out the ingredients, and expose them to fractions and Imperial measurements. Fathers gave examples of having their children help them build sheds, or wooden chairs, or calculate how much concrete was needed for a patio slab and how many boxes of shingles they would need to purchase for the patio's roof. I have personally asked my children to

calculate the cost per ounce of milk and asked them to determine if it was more economical to purchase the pints on sale or the gallon at its normal price. Parents in the study spoke of how as their children became teenagers they would introduce them to the stock market, investing and saving strategies, and discuss financial calculations, with many of the parents giving their children real money to invest in the stock market. As one father said to me, "I put my money where my mouth is. I give them a few thousand dollars to invest when they turn 13. If they lose it there is no penalty, hopefully they learned something. I always worry they are going to pick a stock that goes crazy high, they make lots of money, and then they think it is easy!" There was no formal curriculum for any of the families, rather if life brought about a teachable moment the parents would often take advantage of it. Additionally, many of these families are in financial positions such that their children could actually engage in real world financial experiences without experiencing the downside of losing a few thousands dollars.

Kendra Damahat is an avid reader, reading at least a book a week by her own estimates. In our interview she expressed concerns that her children do not enjoy reading books. To "help with my sanity" Kendra introduced audiobooks to her children. Initially they played them on the car's radio for all to hear but, with children of different ages and interests, she quickly placed audiobooks on their iPods instead and asked them to give the books a listen. For Kendra it was comforting to know her children would have the option to listening to books. The children knew that if they didn't like a book, or didn't want to listen, it was ok with their mother. The children did try listening, though, and found they enjoyed the stories. Kendra, having read the books herself, engaged the family in

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discussions about the books. In my own family my wife and I read the Percy Jackson

series at the request of our sons because both of them thoroughly enjoyed the stories.

Each of my children, of their own accord, conducted their own researching on Greek and

Roman mythologies because of the Percy Jackson books. My children found it delightful

that they had read the books before their parents and could allude and hint at things to

come with knowing smiles. Conjuring my schooled roots I would predict what would

happen in the book and underline the passages that led me to believe so. My sons would

often say, "Yeah, we read that and thought the same thing" which then would lead me to

discuss literary concepts like foreshadowing and terms such as protagonist and

antagonist. Such discussions are, at their essence, a parent acting as a teacher. The

assessments taking place were not overt. There were no book reports required, no tests

asking the names of the antagonists. Rather we would have a rousing round of

discussions about the plot, the moral dilemmas, the consequences of rash actions, etc.

Each family in my study had similar stories of interaction, be it through movies, music, or

literature, or games such as Magic the Gathering or Dungeons & Dragons. The

discussion that parents and children had invariably became one of a more technical nature

because the parents took the conversations in that direction, they worked in teaching

concepts they had learned in school. The children in some of the interviews joked that

"watching a movie with my parents always ends up in a long discussion about the actions

people took in the movie, sometimes that can take as long as the movie itself! I think my

mom wishes she was teaching sometimes!"

As the children grew older nonfiction books entered my families rotation, we became a book club of sorts. Honey Bee Democracy (Seely 2010), Wonderful Life (Gould 1991), Journey to the Ants (Wilson & Holldobler 1994) and The Greatest Show on Earth (Dawkins 2009) each were read by my children, leading to numerous discussions about society, evolution, how scientific research is carried out and the like. None of these book required book reports, it was enough to simply discuss a chapter, or a concept, over a meal or while taking a drive. All of the parents in my study spoke of similar occurrences, where they and their children read the same book and then discussed it at length. Though not formally assessing teaching was most assuredly transpiring.

Assessments of children in the unschooling community need not always require long discussions or drawing "the big picture" for and with them. Unschooling families often assess in what is best described as "pass/try again". Tying shoes is an example that parents liked to talk about. Few, if any, of the children learned to tie their shoes on their own. At some point all of the children had to be taught how to do so if they are to wear more than Crocs their entire lives. The parents joke that shoe-tying, if taught in school, would be graded on the quality of the knot, the bilateral symmetry of the bows, the ability to repeat the shoe-tying rhyme, "Bunny ears, bunny ears, playing by a tree. Criss-crossed the tree, trying to catch me. Bunny ears, Bunny ears, jumped into the hole, popped out the other side beautiful and bold." In tying one's shoes the desired result is that, at the end of the effort, the child can tie a knot that will hold for a good portion of the day. Everyone attains some level of knot tying proficiency and, other than my father, an expert rigger, no one has ever graded my shoe knots. My father, when "grading" my knots, offers

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friendly advice, new twists on an old turn if one will. In this capacity he is the master

craftsman showing a pupil. My children tie better knots than I do because their

grandfather shares knot skills with them in a nonjudgmental, encouraging way, one that

they feel comfortable with. Interestingly enough I never learned many knots from my

father, I felt too graded, too judged, but my children do not feel that way with him

whatsoever. The unschooling community relies upon experts and journeyman, often not

family members, who are willing to share the knowledge to those that are interested.

Technology

The number one concern all parents in the study, especially the mothers, had was

the amount of time their children spend using technology. In every family interview the

mothers spoke of times where they told their children to get off the computers, to go play,

run around, venture outside, to just do something other than play video games.

The parents would, at times, overtly declare "enough was enough, the children

needed to do something else other than video games". For the mothers this often

happened as a result of a child becoming emotional, either frustrated, angry, snippy, or

belligerent to their siblings, a parent, or their friends. Radical unschoolers argue children

will learn from a binge that leads them to being angry and won't do it again (Martin

2009). The parents I interviewed, and spoke with at conferences and park days, said in

the real world that just doesn't happen when it comes to video games. The children seem

to never stop playing. They forego eating, drinking, and even bathing if the parents do

not intervene.

Parents described providing their children "monkey bowls", bowls of fruit and/or vegetables, to make sure their children ate while playing video games for long periods of time. The parents routinely reminded their children to walk around every hour or so and to take breaks. Sometimes the parents would ask the children to talk about the game to help them take a break. Other times the parents were gentle but more direct, "You have been playing for umpteen hours, you've had enough". The parents in this study all practiced gentle parenting, a respectful parenting paradigm that involves asking and getting agreement from children rather than simply demand something be done. However, many of the mothers reported "losing their cool" when their children had played video games for what they perceived to be as "too long".

Video games in particular offer a challenge to parents. Parents find it difficult to determine if a child is having "good" play, play that is productive and driven by a purpose, versus "bad" play, where they may be simply "mindlessly clicking buttons". One mother observed her son playing Realm of the Mad God for a few hours. The entire time he was talking to his friends, via Skype, about how he was intentionally using the weakest weapons and armor. He was experimenting with the limits of the game, actively trying to determine the game's mechanics. This was purposeful play as he was comparing the results of the weakest armor with what normally happens when using "good" and "OP" (Over Powered) equipment. However, unless she listened carefully to what he was saying, or asked him what he was doing, she wouldn't have known that he was actually experimenting within the game. On other occasions he was simply going through the motions of playing. He wasn't vocalizing his pleasure, nor did his body or

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facial expressions indicate delight or joy. She believes in those situations playing video games isn't likely the best thing for him to be doing, it seems to be being done out of habit more than out of intellectual engagement. She struggles, though, in that, as an adult, there are times she wants to simply click buttons on a game like Bejeweled for a while, and just "zone out and relax". Is he doing that while playing games in a zombie-like state? Simply zoning out? Shouldn't he have the right to do so? How can I tell if he is doing that?

The mothers agreed that, because none of them grew up playing video games, it was easiest to get angry at video game play. If a child was laying in their bed all day reading books the parents said they never "lost their cool", rather they would suggest the child find a good stopping point and do something physical for a bit. Often this included having the child tell the parent all about what they were reading. This could be construed as a "book report pop quize", as the parents often asked probing questions, but they said they tried not to make it feel that way. If the children ever felt they were being grilled they would become defensive, withdrawn, or offer short answers. If they felt the interest was genuine the details they offered were usually more than the parents wanted to hear. However, the parents didn't stop them or ask them to provide less details. Rather they, at least in my observations and personal experience, let the child share with them something they were excited about. In many ways these interactions led to their children being treated more like colleagues at work, allowing them to have their own opinions, thoughts and values, and treating them with respect, than treating them like a child, telling them to stop sharing when the parent had heard enough.

Parenting Styles

Parents rarely told their children to, "Get off that game now". By admission and observation what they did instead was ask the children to find a good stopping point, "After that boss is defeated", "When that quest is done", "When that match is over", etc. The parents knew the language of the games, and usually knew the goals and objectives the children had in a particular game. They lamented about games like League of Legends, as that game requires children to work with up to 4 other people, usually strangers, as a team against 5 opposing human opponents. League of Legends has a community that, because it involves 10 individuals playing who's win/loss records determine what rank they are, report people who drop from the game before it is over. When people quit early their team invariably loses which impacts everyone on both teams. People who drop are often reported to in-game moderators as "game abandoners". This label can result in players being banned from playing the game in real life. I believe game designers incorporate such fear-based, let-people-down- you-will-be-banned mechanics to make sure the vast majority of players treat entering a game seriously. For parents, games like League of Legends, raids in Warcraft, Starcraft team matches and the like can wreak havoc with schedules. Parents don't want to be the cause of children getting an in-game demerit or worse, yet there are times when life must go on. Unschooling parents learn to communicate with their children to see what games they are playing. On days when the family has to be somewhere at a certain time the parents make sure the children avoid facing the decision to drop out of a game they are playing at an inopportune moment by giving them advanced warning. This shows respect for the

children's interests and the children, in my observations, repay the respect by making sure they understand what is needed to be done on a particular day and not putting themselves in a situation where they would be required to quit game at an inopportune moment.

For parents in unschooling houses control is something they are happy sharing. As one father said to me at a SSUDs (Secret Society of Unschooling Dads) meeting at the Free to Be Conference,

> "What does it matter if we go to dinner at 6:15pm instead of 6:00pm? Unless I have reservations, or a movie is starting at a specific time, who cares? Too many dads say, 'I'm the alpha male, I say we are going now so we are going now regardless of what you are doing' and make things a struggle over power, rather than making it a team event. I know if a football game I'm watching goes into overtime I am asking the family to hang back so I can see the end, and that can be another 30 minutes!"

Many unschooling fathers grew up in families where their father was "the boss". When their wives brought home the idea of unschooling many of the fathers weren't thrilled with the idea. Over time these fathers say unschooling required them to, sometimes painfully, assess how they viewed, and acted, within the world. The fathers said some of their hardest struggles have been with addressing their emotional reactions to delays in leaving for places, and with bed times. The fathers in my study grew up leaving when they were told to leave by their father, regardless of what they were up to, as the father was "the boss". Regarding bedtimes all of the parents grew up with them

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and each of the fathers have jobs that require them to be somewhere at a specific time each day. The fathers try to lead by example, going to bed at roughly the same time, getting up at roughly the same time, and going to work earning money to keep the family afloat. The term "modelling" is often used at unschooling conferences to discuss how parents live their lives in the fashion they believe their children should strive to emulate. They try to be role models without being demanding.

At unschooling conferences the fathers with older unschooled children share stories, all remarkably similar, of how their teenaged children stayed up all night, never cared about a job, and saw waking up as something their body did naturally when it was good and ready. However, when the time came for a large purchase, typically their first car, the fathers each beamed with pride when they told how their children, who once thought 5 am was a good time to go to bed, had be at work by 5 am. The fathers said their children were never late to work. The teens made their goal of purchasing a car more important than their biological desire to sleep in. In one example the 16 year old son took a job working McDonald's early shift. His 16 year son was never late, and was quickly promoted to shift leader and then asked to become a manager shortly thereafter. The father, who figured his son wouldn't make it to Day 3 on the job without being late, watched, to his delight and surprise, the son had actually observed the traits his father had modeled. Despite never having displayed discipline in anything other than his playing Call of Duty on CoD team, the child was able to make the transition to the working world, and not only did his son work, thrived. The store owner asked the father, "What'd

you do to raise this kid? He is incredible!" to which he replied, "It was all his mother's doing."

These stories are told at conferences by the unschooling "old timers" as ways to assure newly minted unschooling families that things will work out ok, that parents should trust that the children are learning, and that by nurturing, supporting and modeling the children will grow into fine, successful adults. The unschooling population is still small, the sample sizes are few, and the stories told end up being the same: children grow up to be fine young adults, despite not having spent a single day in a classroom not of their own choosing.

Radical

The term "radical unschooler" really should be further defined. On one side of the unschooling continuum exists parents who truly believe their children should pursue anything, and do anything, yet, after a 12 hour computer binge, the parents intervene, overtly or subtly, and redirect the child. These parents allow their children near complete autonomy to pursue hobbies (reading, robotics, programming, gaming) to deep levels. They provide support but also indirectly require feedback and sharing of progress by having open lines of communication and discussion and by showing genuine interest into what the children are doing.

On the other side of the unschooling continuum exists parents who, at least if one believes their writing and self-reports, are not involved in their children's lives. They make no assessments, hidden or otherwise. They are parents in legal standing only. Grunzek (2010) referred to these parents as "unparents". None of my study's population

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resembles these hands-off parents. From subtle solutions to too much game play as no electron day, impromptu camping trips, and less subtle "router failures" that take a few days to fix, even overt, "Please do something else for the next few days" please, the parents intervene at some point if their children have gone "too far" while pursuing their interests. The "radical" unschooler, in the sense of nothing is off limits, may not even be aware one of their children spent a full 7 days, 10 hours or more a day, playing Warcraft. Those parents would fall into the academic definition of neglectful parenting. The unschooling parents I studied, and those that I know personally from park days and unschooling conferences, are involved in their children's lives, and not just as chaperones taking them from activity to playdate to activity (though there is much of that going on). These "hands off" parents are not considered true parents by the unschoolers I studied. The concern about being labeled a "radical" and somehow being associated with being a non-parent was found by other researchers as well (Kirschner, 2008; Grunzke, 2010; Finch, 2012). To the unschooling community at large these self-proclaimed radicals are, unfortunately, the parents that are shown as the "face" of unschoolers. The show "Wife Swap" recently featured a self-published radical unschooling mother who was switched into a family of highly controlled children. Some of the more popular internet sites are unapologetically brash about how important it is to be completely hands off with children. Such tones, to the larger population of unschoolers, do not do justice to the amount of involved parenting actually taking place every day.

I was told at a conference (paraphrased as I didn't have my recorder on but I jotted down the notes right afterwards),

"It sure would be easier if I just laid down the law with my family, just told them you are doing this and then that because I said so. But then I'd miss seeing them grow up and make decisions that lead to wonderful discoveries, things I wouldn't have even thought of doing. I've thought about how I could just let them do whatever they want but that just seems wrong. Parents have a *job* [emphasis theirs] to do. It is harder to parent as an unschooler because traditional I'm-the-boss parenting is out the window. But not parenting isn't an option either, kids need parents, role models, guides, teachers. There is no manual for that!"

This commentary accurately captured one of the commonalities of unschooling parents, their desire to share power with their children while still stewarding their adolescence to a certain degree.

Modeling

The typical parent in my study views themselves as a facilitator, guide and teacher. Many do not call it teaching, they use the term "modeling". They are constantly teaching their children by looping them into tasks. By way of a personal example, my children were involved in a purchase of a new car. I showed them what websites I used to determine what car we were going to purchase. I then showed them how I researched prices and loaded all of the data into a spreadsheet to determine what I believed was a fair offer. My children then listened to my speakerphone calls to a number of dealerships and heard live negotiations in action. The actual purchase of the car was attended in person by them. They watched the sales process, my offers, their counter offers, negotiations for

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extended warranties, financing and the like. Before we went to the dealership I told them what to expect and what to listen and watch for. Thus they weren't surprised to see the classic car sales "four square" appear, in fact I had shown them how it works and why the four square was typically not a good deal for the buyer. They watched me take my time and calculate the last second changes the dealership would offer then try and pressure me to make a decision. They were told that when I stood up to walk out that this was part of the negotiations, a strategy I would employ to see if the dealership had any more room to maneuver. I explained they wouldn't let me walk out of the building unless they truly had no room left to go price-wise.

The most important aspect of the entire experience, though, was the family discussion we had as I drove home in the new car. I asked them how close I came to our original target price? Why did the sales manager try and change the finance terms at the last minute? What kind of obfuscation were they attempting when they kept talking about monthly payments and why was it so important to be able to take those monthly payments and multiply them by the numbers of payments over 5 years to see how much more they were trying to get us to pay? We critiqued my performance, we discussed how close to the plan I stayed, and we talked about what I was willing to give up to make the deal happen.

A few months after the car buying experience my oldest son proudly showed me his World of Warcraft auction house spreadsheet. He showed me how he was buying specific materials at a low cost and then reselling them at a higher cost. I was initially taken aback at the level of detail and thought that had gone into his spreadsheet. It was

only later that I realized he was mirroring my car purchase activities. Could non-unschooled children have an identical experience? Absolutely.

Not all teaching has to take place in such rare or extreme cases as purchasing a car. For example, in nearly all of the families I interviewed I was told how their children were asked work out trip costs when they expressed an interest in going somewhere. Hotels, meals and event prices, as well as recommendations on if it better to drive and see things on the way or fly and get a rental car, were requested of the children. The younger children, if not asked to crunch numbers themselves, were shown how to look up places in a city, or along a route, and to give their recommendations. The children learned map reading skills, as well as how to use the in-car GPS. Often the older children are assigned navigator duties on long trips.

To unschooling families grocery store runs mean weekly meal planning, a perusal of store ads, and, since the majority of the families in the study shop at specific stores for specific items, a trip plan incorporating perishable goods would need to be created. Though not formal assessments in the traditional sense, there were no grades given, the unschooling children's grocery store plan was critiqued by parents as to its feasibility and where the plan was strongest and where it may have some shortcomings, such as if the children's plan had milk being purchased at the first stop.

Unschoolers overtly teach their children about "the real world" by including and discussing with them what is transpiring in the family lives, rather than simply dragging them along. The majority of the participants in this study had a teaching background, either they themselves were Education majors or their parents were. For those that did

not have formal education background the parents had advanced degrees and possess educational capital by virtue of their success in traditional academics. At the unschooling conferences I have attended I am still surprised at the number of mothers I meet who are teachers by day yet their children don't go do school (their husbands have jobs that allow them to work from home in these scenarios).

The unschooling community is not "against" teachers, or teaching, as long as the teaching takes a child's interests into account. The teachers who practice unschooling at home that I spoke with explained the public schools they teach at are focused on the standardized test scores and curricula. The classes are so large that classroom management is important and that children that are most obedient are some of the most prized students. The precocious child in the corner can't be properly attended to because there is no time in the day. If a child is sick for a week school doesn't stop, it doesn't ever let the child catch up. In math if they miss a week that happens to include the beginning of a new unit, such as how to multiply fractions, unless their parents can teach them at home, or they use an online tool, they may not ever catch up. A long illness typically impacts grades which, in today's grade-driven culture, can have far reaching repercussions such as not qualifying to get into an AP class later on. Two of the teacher-mothers I spoke with said they likely would not be teaching after this year, especially when they compared their own children and what they are learning without a formal curriculum to those in classrooms. When I asked unschooling mothers how they know their children are learning the mothers said,

"You can tell. You just ask them! Sure they don't all learn the

same things at the same time but that's ok. My students don't learn what

they are supposed to and they are in school!"

Ownschooling, a new term

I propose a new term, "Ownschooling", to replace unschooling as a term to

describe education owned by the individual, and the family. Ownschooling captures the

alliteration of Holt's unschooling but replaces it with a key syllable, "Own".

Unschooling advocates agree that they, and their child, are responsible, or "own", their

education. Not the state, government, society, or church. No one but the individual

learner is responsible for their education, they "own" the content that goes into it.

Future Research

Many areas remain to be explored within the unschooling community with

regards to how technology is used. Of utmost importance would be the monitoring of

Android and iPad/pod devices. The latest versions of monitoring software enable

monitoring of all internet accessible devices, save the console. The software allows

integrated reports that would allow a better understanding of concurrent use of devices

and provide quantitative evidence of the division of duties among different electronic

devices: browsing on tablets, social media via smartphones, game play and creation on

desktops and laptops.

Creating content in this study was the near-exclusive provenance of desktops and

laptops. Future studies would do well to look into new form factors, the Lenovo Twist

and Microsoft Surface Pro 3 with its laptop-becomes-a-tablet form factor to see if

creation continues to be done on these devices. The next generation of "phablets" (phone

tablets) with Bluetooth and Near Field Communication (NFC) capabilities that allow

them to interface with wireless keyboards, mice and storage devices may allow creation

to fully leave the desktop and laptop sphere.

Implications of creation happening nearly exclusively on desktops and laptops

means today's push for iPads and tablets into the school system may be setting the

children up for a life of consumption of technology rather than creation. Many students,

especially those of low socioeconomic bent, do not have access to desktops or laptops at

home even when they do have internet. Will school's push to use tablets actually prevent

children from becoming the makers of the next generation?

A follow-up study on my own unschooling population's late teen years would be

illuminating. How does their use of technology change? At what age does social media

become dominant among unschoolers? In my population only the 14+ year old children

were heavily consuming social mmodestedia. Will that age go down over time?

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APPENDIX A

UNSCHOOL QUESTIONNAIRE ADULT

Parent Unschooling Questionnaire
        Page 1
Unique ID_____
Child(ren) Information

Please complete the information below for each of your children:

Name	Gender	Age	How long Unschooled?

Weekly activities
Please place checkmark beside typical weekly activities engaged in:
___ sports   ___art   ___music/dance   ___church   ___volunteering   ___scouts
___library   ___special interest classes (drama, cooking, science, etc)   ___playing
___other _____

Use of Technology by your children
Check each of the devices your child(ren) routinely use:
__desktop   __laptop   __tablet (iPad, Nexus, etc.)

__e-reader (nook, kindle, etc.)   __Handheld video game   __Video game console (xbox/ps3, etc.)
__smartphone   __iPod/Zune that is wirelessly connected to the internet
Is your home wireless enabled? __Yes   __No
Do any of the above devices possess 3g+ capability (ie can be used w/o a wi-fi connection?) __Y __N
Do your children own their own:
__Desktop   __Laptop   __tablet   __e-reader   __Handheld video game
__smartphone __iPod/Zune that is wirelessly connected to the internet

Unschooling Questionnaire
      Page 2
Do your children have unrestricted access to the internet? __Yes __No
      If No what tool(s) do you use to restrict access?
Do your children have a maximum amount of time on the internet:
per day? __Yes __No
per week? __Yes __No

Do your children have to complete specific actions before they can use the internet?
__Yes __No
      If so, what actions?
Do your children use any of the following items on a weekly basis?
__websites   __texts   __email   __Facebook   __IM   __video
games
__Streaming video products (Netflix/Hulu/Amazon Prime, etc.)   __Television (non-
internet streaming)
__DVDs   __podcasts
Other:
Do your children create internet content? If so check all that apply:
__Facebook   __Instagram   __Pinterest   __YouTube   __Minecraft   __Twitch
Other:
How many hours a day do your children use technology during a week?
___never   __0-2 hrs/day __2-4 hrs/day __4-6 hrs/day ___8-10 hrs/day ___10+
hrs/day
Comments:
Unschooling Questionnaire
      Pate 3
Top 3 frequently accessed education-related websites:
1-
2-
3-

Top 3 frequently accessed non-education related websites:
1-
2-
3-

If use of technology is restricted, please explain why and in what ways:

Mother's Basic Information

Name (Mother):

      Occupation:

      Industry (Line of work):

      Your level of education:

      __High School

      __Some College

      __Associate's

      __ Bachelor's

      __Teaching Certificate

      __Master's

      __Doctorate

      __Trade School Certification/Accreditation

Marital Status:

Homeschooled/unschooled as child?

      If Yes for how long?

Did you initiate Unschooling ?

How did you learn about Unschooling?

How long have you been Unschooling?

How many years did each of your children attend public school?

Were you involved in La Leche League?

Unschooling Questionnaire
Unique ID_____

Father's Basic Information

Name (Father)
      Occupation:
      Occupation:
      Industry (Line of work):
      Your level of education:
      __High School
      __Some College
      __Associate's
      __ Bachelor's
      __Teaching Certificate
      __Master's
      __Doctorate
      __Trade School Certification/Accreditation
      Marital Status:
Homeschooled/unschooled as child?
      If Yes for how long?
Did you initiate Unschooling?
How did you learn about Unschooling?
How long have you been Unschooling?
How many years did each of your children attend public school?

APPENDIX B

UNSCHOOL QUESTIONNAIRE CHILDREN

Unschooling Questionnaire
        Page 1
Unique ID_____

Your age:
Gender:

Favorite things about unschooling:
1-
2-
3-
4-
Special areas of interest (example: animals, video games, websites, space, reading, etc.) – write all that you are really interested in:

Things you're really good at. Write as many as you'd like:

Unschooling Questionnaire
     Page 2
Technology
How much time each day do you use computers or other electronic devicies?
___none   ___1-2 hrs   ___2-4 hrs __4-6 hrs __6-8 hrs __8-10 hrs ___10+ hrs

What computer or electronic items do you own personally (check all that apply):
__desktop   __laptop   __tablet (iPad, Nexus, etc.)

__e-reader (nook, kindle, etc.)   __Handheld video game   __Video game console (xbox/ps3, etc.)
__smartphone   __iPod/Zune that is wirelessly connected to the internet
Other:
What do you use the above items for most? (list all the things you use them for, feel free to write on a separate piece of paper if you need more room)

What software do you use? (ex. Photoshop, PowerPoint, Excel, Mod tools, CheatEngine) – list as many as you use in a month:

What websites do you visit for educational purposes? (Ex. Khan Academy, YouTube, Wikipedia, etc.) – list all you use regularly:

What hardware items (computers, handhelds, phones, etc.) do you use the most?

    Where do you use them?

    Do you use them wirelessly?

Unschooling Questionnaire

   Page 3

How do you spend your time on the computer?

 ___information gathering

___social networking (including email, blogs, IM, social sites)

___educational games

___entertainment (gaming, music, youtube)

___lessons/practice   other_____

What would you tell friends about unschooling:

APPENDIX C

INTERVIEW QUESTIONS

Parents Interview Questions

1-What is your understanding of unschooling?

2-How did you discover unschooling?

3-Describe what makes you an unschooler?

4-What factors led you to decide unschooling was right for your family?

5-What research was done before you began unschooling?

6-What kind of challenges have you faced since unschooling?

7-How did your family take to unschooling?

8-What benefits have you seen as a result of unschooling?

9-What concerns do you have about unschooling?

10-How important is technology in unschooling your family?

      a-What technologies do the children use?

      b-What is the perceived amount of time, what websites, hardware and software are used by children?

Parents Post-Verity Interview questions
1-Please describe how the Verity data mirrors your observations of the use of technology for education by your children
2-What, if anything, surprises you about the data?
3-What, if anything, would you like your child to change regarding their use of technology for education?

Child(ren) Interview Questions
1-Did you attend a regular school?
2-What do you think of the way you learn now?
3-Do you (or have you) taken formalized learning classes?
4-How often do you use technology?
5-How important is technology to you?
6-What do you use it for? (Ask follow up and elaborate questions here)
7-How much time do you spend online alone? With friends?
8-What websites do you go to when you have questions?
9-Walk me through what you do when you want to learn something specific?
10-What and how do you use technology outside of the home?