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Digital Scripture: An Investigation of the Design and Use of a Mobile Application for Reading Sacred Text

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DIGITAL SCRIPTURE: AN INVESTIGATION OF THE DESIGN AND USE OF A MOBILE APPLICATION FOR READING SACRED TEXT

by

Neil Carpenter

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ABSTRACT

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Digital sacred text reading is rapidly growing as digital devices such as mobile smartphones are becoming more common across the globe. Although sacred text can have strong influence on identify and behavior, the effects of a digital revolution on scripture reading practices are not well understood. In particular, burgeoning research on digital religious text has begun to consider the implications of mobile application (app) design and use. However, a review of current research literature indicates more work is needed in simultaneous analysis of sacred text app design and use within specific religious communities. Therefore, this study builds upon and extends previous work by utilizing a theoretical framework of Gibson's Affordance Theory (1979) to analyze a religious text app, Gospel Library. A virtual ethnography design guided the collection of data from app store description textual analysis, app walkthrough methodology, design team interviews, and descriptive user analytic data. Results show that this digital sacred text app is designed and used in ways that support religious or cultural reading values and norms. In particular, this study of Gospel Library design and usage patterns suggests that Latter-day Saints

appear to value the King James Version of the English Bible and other unique religious text such as the Book of Mormon and General Conference sermons or messages. Results also suggest Latter-day Saints value church-wide directed scripture reading efforts situated in a culture of listening and receiving interpretation as opposed to social discussions of scripture. Furthermore, this study reports unique features or affordances that digital sacred texts can offer including audio capabilities, videos, search functions, sharing, highlighting, and other annotations. This study contributes to the research field of digital sacred text literacy by offering data gathered from an app design organization including interviews and user analytic data. It also adds to the broader conversation about religious literacy and digital versus print-based reading.

(204 pages)

PUBLIC ABSTRACT

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Digital sacred text reading is rapidly growing as digital devices such as mobile smartphones are becoming more common across the globe. Although sacred text can have strong influence on identify and behavior, the effects of a digital revolution on scripture reading practices are not well understood. In particular, current research literature indicates that more information is needed about the design and use of digital sacred text applications (apps) such as mobile Bibles across different religious groups or cultures. Therefore, this study builds upon and extends previous work to analyze a religious text app, Gospel Library, which is designed and largely used by members of The Church of Jesus Christ of Latter-day Saints. Data about the design of the app were collected by analyzing app store description text, conducting a technical app walkthrough, and interviewing current app design team members. Data about the usage of Gospel Library were collected by gaining permission from the design organization to access user analytic data collected during normal app operations. Results of the study show that this digital sacred text app is designed and used in ways that support religious or cultural reading values and norms. In particular, this study suggests that Latter-day Saints appear to value the King James Version of the English Bible and other unique religious text such as the Book of Mormon and General Conference sermons or messages. Results also suggest Latter-day Saints value church-wide directed scripture reading efforts situated in a culture

of listening and receiving interpretation as opposed to social discussions of scripture. Furthermore, this study reports unique features or affordances that digital sacred texts can offer including audio capabilities, videos, search functions, sharing, highlighting, and other annotations. This study contributes to the research field of digital sacred text literacy by offering data gathered from an app design organization including interviews and user analytic data. It also adds to the broader conversation about religious literacy and digital versus print-based reading.

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Neil Carpenter

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CHAPTER I

INTRODUCTION

Overview of Digital Sacred Text

Evidence shows that with the expeditious growth of digital device use and reading practices, there is a rapidly growing demand for digital sacred text such as Bible mobile applications or apps (Hutchings, 2015a, 2017; Richardson & Pardun, 2015). We know that sacred religious texts are read and interpreted in ways that can have strong developmental influence on religious, political, academic, and personal identity and behavior (Rackley, 2017; Reyes, 2009; Sarroub, 2002; Skerrett, 2014). We also know from a large body of research that there are important differences in outcomes and processes between digital and traditional print reading environments (Delgado, Vargas, Ackerman, & Salmerón, 2018; Liu, 2005; Singer & Alexander, 2017). Yet very little is known about the processes or effects of digitally reading sacred text.

Researchers in the burgeoning field of digital sacred text have recently begun to investigate the design and use of scripture mobile applications (Bellar, 2016; Gorichanaz, 2016; Hutchings, 2015a; Torma & Teusner, 2011). However, current researchers recognize that more work is needed in concurrent analysis of the design and use of digital sacred text applications (apps) within specific religious communities (Bellar et al., 2018). Researchers have further called for studies that draw upon designers of religious apps in order to understand those designers' motivations, intentions, or priorities (Bellar, 2017; Campbell, Altenhofen, Bellar, & Cho, 2014; Hutchings, 2017).

Moreover, the scant previous research on sacred text app users relies primarily on self-reported data to understand user perceptions and perceived use of digital scripture (Gorichanaz, 2016; Hutchings, 2015a; Richardson & Pardun, 2015). Hence, researchers have beckoned for empirical approaches that utilize more direct measures of reading with sacred text apps such as analysis of user data recorded by design organizations (Bellar, 2017; Hutchings, 2015b). Specifically, researchers such as Hutchings (2015b) have described "truly remarkable new frontiers" (p. 108) that could come from working with design organizations not only to interview design teams, but also to access and analyze previously collected data of user activity or behavioral patterns.

Therefore, after a brief introduction and overview, this paper will articulate a review of extant research on reading digital sacred text. Then, utilizing a theoretical framework of Gibson's Affordance Theory (Gibson, 1979), a study is described which investigated the design and use of a mobile app for reading sacred text within a particular religious community. Specifically, this research study investigated the design and use of Gospel Library, which is produced and largely used by members of The Church of Jesus Christ of Latter-day Saints for studying sacred text.

Sacred Religious Text

Why is sacred or religious text important to research? Perhaps every society, community, or group has important documents, texts, or stories used as common touchstone tools to unite or define their organization or affiliation. The United States has its Constitution, fan clubs have Harry Potter novels, and religious groups have scripture such as the Muslim Qur'an or the Christian Bible (Ronald, 2012). However, the ways in

which these texts are read, understood, and interpreted can deeply shape beliefs, paradigms, or worldviews, and, can scaffold behavior, practice, and participation in many facets of social interaction (Prothero, 2007; Rackley, 2018). Yet, religious literacy remains sparsely researched.

Influence and Abundance of Sacred Texts

Sacred text or scripture has been defined as "those teachings to which are attributed a great sense of reverence or worth because of their alleged divine origin and/or use in facilitating religious and/or spiritual experiences" (Tsuria, n.d., p. 2). That great sense of reverence or worth can strongly affect adherents in a number of ways. For example, sacred texts such as the Bible, Book of Mormon, Qur'an, Sutras, Tanakh, and Vedas have been shown to play a vital role in the development and expression of political identity and behavior (Lindsay, 2007; Prothero, 2007). Scripture can shape the way people form opinions and take action in the world including justification for positive participation in society, or lack thereof, and raising children with similarly aligned views (Rackley, 2016). Furthermore, the ways in which adolescents religiously identify themselves has been shown to frame their personal and secular or school-based academic identities (Reyes, 2009; Skerrett, 2013, 2016); and, academic engagement can be strongly influenced by religious interpretation of sacred texts (Bahari, 2018; Eakle, 2007; Jackson, 1998; Reyes, 2009). For example, a meta-analysis of 11 studies conducted in U.S. urban areas found that "increased Bible knowledge is associated with higher levels of student academic achievement and positive behavioral patterns" (Jeynes, 2010, p. 522).

Referring to the Bible in particular, some have claimed that "the Christian Bible, has influenced more people than any other book in world history" (Parmenter, 2013, p.

55). Indeed, Jeynes (2010) further expounds the critical role of religious conviction centered around sacred text by citing evidence that:

- Religion and the Bible are two of the most puissant social forces in the world historically and in contemporary society (Blanshard, 1963).
- Peoples' religious convictions were largely responsible for the abolition of slavery, the women's suffrage movement, prison reform, and the civil rights movement; but, they have also rested behind numerous wars of centuries past and the Middle East tension of today (Prothero, 2007).
- The Bible stands all by itself as not only the most published book in history but also as the world's most published book every single year, and it is the world's most-cited book (Prothero, 2007; Van Biema, 2007).
- About 84% of Americans subscribe to a Judeo-Christian faith and nearly 5% subscribe to another faith tradition, bringing the total to about 89% of Americans who adhere to a certain kind of faith (Grossman, 2006).

Prothero (2007) further argues that, "with a Christian population of about 250 million, there are more Christians in the United States today than there have been in any other country in the history of the world" (p. 16), with more than 90% claiming faith in a God. In 2007, Prothero claims, 92% of the U.S. Congress was Christian, and in 2000, 100% of state governors identified themselves as Christian. Prothero reports, "When it comes to biblical literalists—those who say they believe that the Bible is the literal word of God—only the Philippines (54%) and Poland (37%) rank higher than the United States (34%)" (p. 31). A majority of young people in the U.S. are also connected to religious text with 85% of adolescents self-identifying with a religious group (Smith & Denton, 2005).

Using a large nationally representative sample of adolescents, Wallace, Forman, Caldwell, and Willis (2003) found that "60% of American young people feel that religion is an important part of their life, 50% regularly attend religious services, and the vast majority report an affiliation with a specific religion" (p. 98). Noting the enormous influence of Evangelical Christians in the United States, Juzwik (2014) claimed that "it may be fair to place evangelical Biblicism among the most pervasive literacy phenomena in American life," even though it remains "under-the-radar" (p. 336).

Lack of Sacred Text Research

Notwithstanding the potentially tremendous influence that sacred text plays in the U.S. and throughout the world, religious literacy remains an underdeveloped area of academic research. Speaking specifically of adolescents, Rackley (2016) emphasized:

> We simply do not have a comparable body of research that attends to the place of literacy in the lived experiences of religious youths despite the ubiquity of religion worldwide and the powerful influence it can exert on people, politics, popular culture and education. (p. 4)

Elsewhere, Rackley (2014) asserted, "Religion can no longer be ignored or treated lightly in literacy studies. It is too powerful a force for individuals, communities, and the world not to take seriously" (p. 433).

We know that sacred text connects a majority of Americans to religion and religious communities, behaviors, and social morals. However, more work is needed to understand the literacy practices that claim to be so important to so many. Simply put, we know that sacred text is important, but we do not know as much concerning how it is used or read. Notwithstanding, researchers have begun to identify some reading practices

or behaviors associated with traditional print scripture among groups such as Methodists and Latter-day Saints; this research is outlined in Chapter II.

Digital Reading

What about *digital* text or reading and its role in scripture literacy? Do readers approach digital sacred text differently than traditional print? The advent of mobile device technology is making sacred text readily available to an even larger audience and it may be shifting the way people read and interpret sacred text.

Growth of Digital Devices

The rapid and striking growth of mobile phone technology and apps has been noted by several scholars. For example, Bellar (2016) declared that mobile apps and devices are "becoming ubiquitous with more than 1.5 million apps and one billion downloads from the iTunes app store alone" (p. 112). Rinker, Bailey, Embler, Roof, and Harvey (2016) stated, "smartphones have become the fastest-selling gadgets in history," estimating that 50% of the global adult population owned a smartphone in 2015, and by 2020 around 80% will have one (p. 3). Interestingly, the 10th Annual Cisco Company Report (2016) projected that by 2020 there would be 5.5 billion mobile users globally. This figure is striking because it represents 70% of the planet's population having access to mobile interfaces while Cisco claims only 3.5 billion or 45% will have access to running water.

Growth of Digital Scriptures

These figures do not exclusively represent digital scripture reading; nevertheless, digital sacred text has taken a notable slice of the market. For example, scripture reading mobile apps such as YouVersion Bible, Gospel Library, and JW Library have been collectively downloaded and installed hundreds of millions of times (Hutchings, 2017). The YouVersion Bible app is often the top-ranked app under the reference section of the iTunes app store; and, as of August 2013, it was reportedly installed by users located in every country on earth (Hutchings, 2014). Even in underdeveloped areas of the world, mobile technology is propagating faster than traditional forms of infrastructure, and remote customers with a cell phone and Internet access tend to disproportionately be Christians according to some reports (Jacobs, 2011). Bellar, Cho, and Campbell (2018) note the burgeoning use of mobile technology for religious purposes and Hutchings (2015a) has called the Christian Bible one of the more "high-profile success stories of the e-reading marketplaces" (p. 424).

Digital vs Print

There are a number of potential ways in which digital e-reading is not the same as reading from traditional printed paper. For example, digital reading may encourage more shallow comprehension and skimming behaviors (Liu, 2005; Mangen, Walgermo, & Brønnick, 2013); and, people often express a preference for print over digital when reading difficult or complex texts (Cull, 2011; Sandberg, 2011; Walsh, 2016). Preference for print over digital versions has also been expressed when reading the Bible for personal reflection, emotional, or devotional purposes (Gorichanaz, 2016), along with perceptions that text presented in paper print is more authoritative than text presented

digitally (Walsh, 2016). Furthermore, research suggests that reading digitally is associated with decreased comprehension, and differences in comprehension between reading in print and digital seem to be increasing with time (Delgado et al., 2018). Notwithstanding potential disadvantages of digital reading, some indications suggest that those who have taken to digital reading may be reading more frequently and reading more words overall than their print-reading counterparts (Carr, 2010; Hutchings, 2015a; Liu, 2005), albeit more shallowly or with less depth and intensity (Liu, 2005; Mangen & van der Weel, 2016).

An apparent paradox currently exists in our understanding of reading digital sacred text. The practice seems to be growing and exerting a strong presence; yet, most indicators presently suggest digital reading may be inferior to traditional print reading. However, some scholars have concluded that we have insufficient models for understanding the complex multi-faceted dimensions of digital reading (Mangen & van der Weel, 2016). For example, Ross et al. (2017) suggested that a false dichotomy between print and digital is not helpful as both offer different features, functions, or affordances; therefore, each may have a role to play in the future of reading. Mangen and van der Weel (2016) emphasized that a multidimensional framework of reading should account for the affordances or features of a substrate or device (paper vs. iPad), as well as the motivational, experiential, or sociocultural implications of reading, among other dimensions or factors. In other words, people do not read every book or page for the same reasons or with the same goals, and they may not be universally reading digitally for the same reasons as reading in print. Investigating the intentionally designed affordances of a religious text app and how the app is actually used or read within a

specific religious group context may provide information about how, why, or in what ways, digital text may be more or less meaningful or useful for populations in particular social or cultural settings.

Statement of the Problem

The social framework surrounding reading and interpreting sacred text can deeply influence personal, political, social, and academic identity and behavior (Rackley, 2018). Mobile applications are being increasingly used to access and read digital sacred texts (Bellar, 2016; Hutchings, 2015a). Yet, there is a lack of research that investigates how sacred text apps are being designed and used in ways that correspond to the burgeoning use by Christians and other religious populations. Therefore, the following questions are proposed for this current research study to investigate the design and use of a digital sacred text app, Gospel Library, which is largely used by members of The Church of Jesus Christ of Latter-day Saints.

1. What affordances and limitations have mobile application (app) designers incorporated in the digital sacred text app, Gospel Library?
2. How, or in what ways, has a selected sample of Gospel Library app users utilized the designed affordances and limitations of the app?

Assumptions, Delimitations, Limitations of the Study

It is recognized that generalizability of findings is limited by focusing on one specific religious group and app. However, it is also hoped that by taking a narrower approach, deeper and richer data may be collected and analyzed for more nuanced

understanding. The student researcher's religious affiliation and interest drive the decision to focus on Latter-day Saints and the access to key participants and data.

Statement of Positionality

The student researcher for this study is a member of The Church of Jesus Christ of Latter-day Saints and is employed by the Church as a religious educator or seminary and institute instructor. Religious educators within the Church provide regular weekday religious instruction for high-school and college-aged students. This employment position has created an awareness and interest in the use of digital scripture. However, no data were procured with exclusive dependence on the student researcher's Church affiliation. It is recognized that bias and research blind spots are present in the student researcher, and steps were taken to increase research quality such as utilizing an unaffiliated second data coder, member checking, and following previously established research procedures and methodology. It is also anticipated that the student researcher's religious and employment association provide a more sensitive cultural awareness and helps to contribute an insider perspective by following ethnographic approaches in which researchers take on the role of participating observers.

Gospel Library App

Gospel Library is a scripture app developed and largely used by members of The Church of Jesus Christ of Latter-day Saints for accessing, reading, or studying sacred religious text since 2010. As of 2020, the Church reports a total global membership of 16.3 million, with only around 40% (6.7 million) living in the United States (Church of Jesus Christ, 2020). Google Play (2020), an online app store for Android devices,

publicly reports that Gospel Library has been downloaded over 5 million times. However, that figure does not account for other major platforms that do not report installs such as iTunes for Apple iOS, Microsoft, or Amazon Kindle devices. Therefore, it is difficult to ascertain the extensiveness or overall total installs and use of Gospel Library.

Several texts or books of scripture considered sacred are curated within the Gospel Library app, namely the Christian Bible (consisting of the Old Testament and New Testament), the Book of Mormon, the Doctrine and Covenants, and the Pearl of Great Price. In addition to these books of scripture, the app contains several other types of texts and content such as instructional and leadership manuals, sermons, hymnbook, religious magazines, history books, and videos. These materials represent a large array of text genres including narrative, expository, procedural, and others. In particular, the books of scripture represent several different text types and levels of complexity. Speaking of the Bible and Book of Mormon, Rackley and Kwok (2016) have argued, "Given the various linguistic, intratextual and contextual features of these texts, they both qualify as complex texts as informed by the ACT and Common Core text complexity criteria" (p. 56). Although the majority (above 90%) of the Bible and Book of Mormon are written at about an eighth-grade reading level, both books of scripture include "various and intricate uses of language such as ancient poetic forms; lengthy, complex narratives; detailed, context-dependent epistles; wisdom literature; extended allegories and metaphors; imagery; typology; and apocalyptic literature" (Rackley & Kwok, 2016, p. 56). Therefore, given the complexities of text types, this study is not focusing on comparing reading behaviors across text genres per se; although, effort was taken to investigate differences in affordance use or reading behaviors across different books,

texts, or content areas within the Gospel Library app. Instead, the focus of this study is on affordance design and use within a digital sacred text app.

Assumptions

This study was designed acknowledging several assumptions. It is assumed the Gospel Library design organization is offering accurate data without manipulation, and the design team interviewees were able to honestly share their priorities and intentions. It is further assumed that design teams have made intentional choices to include or exclude app affordances or design features based on internal organizational goals and external user feedback, while using finite resources. Furthermore, it is assumed that if adherents are finding value and meaning from reading and using digital sacred text in culturally relevant or personally impactful ways, some form of sufficient comprehension is occurring. Moreover, it is expected that users engage with an app and its designed features to achieve desired outcomes whether personal and internal or social and external, and that some app affordances are perceived as more helpful or useful to achieve those outcomes.

Delimitations

This study was intended to investigate app affordance design and use which are guided and informed by cultural norms or values. This decision was made, in part, to respond to current researchers' calls for increased understanding of the ways in which social and cultural context provide motivation and meaning to digital reading and shape both the design and use of sacred text apps (Bellar et al., 2018). Therefore, this study excluded comprehension as a focal variable of investigation. In addition, this study did

not directly measure other potential effects of digital sacred text reading on outcomes such as affective experience, emotional, devotional, or perceived spiritual connections. Although these variables are important and should be considered in the future, current researchers suggest more information is first needed on how digital sacred text apps are being designed and used (Bellar et al., 2018; Hutchings, 2015a, 2015b). Relatedly, for the purposes of this study, only apps available on mobile touchscreen devices were considered, even though digital reading can take place on many types of systems (e.g., phones, tablets, laptops, etc.).

Other delimitations regarding specific methodology (as described in Chapter III) may include shortcomings inherent to data collection and analysis approaches. Specifically, when analyzing the designed and intentional affordances of Gospel Library, decisions were made to delimit the number of other sacred text apps used for contrast and comparison. Moreover, only an analysis of current app design occured, and not historical iterations which could further inform ways in which designed affordances may have been shaped in response to usage and social values. In addition, design team interviews were conducted with only the current app manager and designer as opposed to other staff members including past designers.

Limitations

The scope of this study is limited by the user analytic data previously recorded and offered by the app design organization. This study is also limited because of the descriptive approach of inquiry as opposed to correlation or causation. No variables were manipulated by the student researcher; therefore, causation between affordance design, use, and cultural significance cannot be demonstrated. Further, only limited correlations

between app design and use can be inferred. However, descriptive approaches to user analytic data gathered from design organizations may be most appropriate to respond to scholars in the field and necessary for future inquiry (Hutchings, 2015b).

Significance of the Study

This study was intended to respond and contribute to the field in a number of important ways. First, studying the motivations and practice of digital sacred text design and use responds to Mangen and van der Weel's (2016) call for a more multidimensional and broader model of general digital reading. Sacred digital text may provide affordances that may be differentially utilized by distinct social, cultural, or religious groups. Second, this study adds to the research base of religious literacy. Previous work in religious literacy has found several strategies and motivations that religious readers use as part of their everyday religious cultural practices to overcome barriers presented by complex and archaic sacred text (Rackley, 2018; Rackley & Kwok, 2016). However, it is not known if these or any strategies are intended and supported by the design of digital sacred text apps; and, little is known about the ways in which digital sacred texts are read.

Lastly, although this study is intended to be responsive to the field of digital reading and the field of religious literacy, it is hoped that this study can provide a critical resource and step for researchers interested specifically in digital religious literacy. In particular, researchers in digital sacred text have called for work that utilizes app design companies and organizations to understand their design priorities (Bellar et al., 2018; Hutchings, 2015b); to date, only a few studies have been published that have directly interacted with design groups. Furthermore, researchers have called for studies that

contribute data independent of users' (potentially biased) self-reporting of their app usage (Bellar, 2017; Bellar et al., 2018). Hutchings (2015b) beckons, "if academics can persuade Bible software companies that their research skills are useful enough to merit access to user data, then we may begin to see some truly remarkable new frontiers of research" (p. 108). However, in the review of the literature for this study, no study was located that analyzed user data generated by sacred text app companies or organizations. This current study may demonstrate a way to work with design organizations to access the kind of user analytic data suggested by Hutchings. In addition, researchers have called for studies that concurrently analyze the design and use of sacred text apps within specific religious communities (Bellar, 2017; Bellar et al., 2018). Only one study was located that concurrently analyzes the design and use of religious apps, specifically prayer apps (Bellar, 2017). This study will build on the previous work of Bellar (2017) by investigating the design and use of a sacred text app. It is also recognized that this study may have implications for future design and instructional or devotional use of digital text, and in particular, digital sacred text.

CHAPTER II

REVIEW OF LITERATURE

Digital reading devices and practices have become prevalent in our modern society (Kong, Seo, & Zhai, 2018; Singer & Alexander, 2017; Walsh, 2016). These digital devices (such as smartphones and tablets) are frequently used to read or access a wide variety of texts including religious texts (Bellar, 2016; Morris, 2016). However, the effects and processes associated with digital reading devices and practices may not be well understood when compared to reading in more traditional print-based ways (Delgado et al., 2018; Mangen & van der Weel, 2016). In particular, the effects of the digital revolution on religious reading of sacred text need to be better understood, especially considering several potential affordances, functions, or features that digital text may offer in comparison to print (Bellar et al., 2018). Therefore, a review of the literature was undertaken to ascertain what empirical research and scholarly literature has been published along with associated findings and suggested future directions. The purpose of this chapter is to first articulate a theoretical framework, then review, evaluate, and synthesize research on reading of digital sacred text.

Theoretical Framework: Gibson Affordance Theory

Affordances are defined as the features or usability that tools, objects, or artifacts offer a human or other living organism within an environment. In the words of Gibson (1979):

> The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill. The verb to afford is found in the dictionary, the noun affordance is not. I have made it up. I mean by it

> something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment. (p. 127)

Affordance Theory (Gibson, 1979) holds that physical objects in the material world are perceived by humans and other living organisms to be useful as tools to achieve desired outcomes. This theoretical stance connects the material with the immaterial through the agency, perception, experience, and motivations of humans. Furthermore, experience and motivation can shape how a tool and its utility are perceived. For example, a chair affords sitting for a tired adult, however the same chair may not afford the same usability for a toddler who may perceive the chair as something only to be used to stabilize while learning to walk. A garbage container may be seen as a tool for discarding unwanted things by one person, but to another hungry person or organism the same container may be viewed as a resource to find food.

Thus, affordances can refer to how an object is intended to be used, how it should be used, or how it can be used. Indeed, the usability of an object or tool can change over time and is moderated by the current desires and perceptions of a potential user. Yet, affordances can also be shaped by an intentional designer and the nature of the tool's design or natural features. Norman (1988) extended Gibson's notion of affordance by drawing attention specifically to the design of things:

> Affordance refers to the perceived and actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used. … Affordances provide strong clues to the operation of things. Plates [on doors] are for pushing. Knobs are for turning. Slots are for inserting things into. Balls are for throwing or bouncing. When affordances are taken advantage of, the user knows what to do just by looking: no picture, label, or instruction is required. Complex things may require explanation, but simple things should not. When simple things need pictures, labels, or instructions, the design has failed. (p. 9)

Human agents both shape and are shaped by the tools they use within the context of a larger ecological or social world. For example, driven by a desire for heat and light, early humans may have used two rocks to create a fire by striking them together. However, once that fire was created, it was used to change, control, or moderate the environment. Indeed, that same fire could then be turned back against rock to smelt ore and create metal tools with which further environmental changes could take place. A more relevant example can be drawn from advancing mobile technology in modern times. Driven by a desire to communicate, connect, and stay informed, mobile phones were developed to afford more convenient and accessible social connectivity. However, as mobile phones became more familiar and common, they shaped our expectation of social interactions and responses. Whereas it was once a reasonable social expectation to write a letter and receive a response within a few weeks, we now expect an immediate response or at least within a few hours. That expectation for more immediate and convenient connectivity and response has further driven the development of more resources and tools such as Wi-Fi and constant Internet accessibility. Thus, there is a reciprocal and iterative relationship between artifact affordances, designers, and users that exists within a context of social or cultural norms, values, and practices.

Affordances and Social Norms

Gibson (1979) asserted that an important component of human socialization and induction to society comes from learning to use tools and artifacts in the proper or socially acceptable ways. Learning to use a garbage container, toothbrush, chair, or words in the conventional or commonly-agreed-upon way allows a person to enter into

the shared practices of society (Costall, 1995; Kono, 2009). We are provided hints, demonstrations, and instructions regarding the proper use of tools by their design as well as modeling. A toothbrush could be grabbed by the bristles and used to clean out someone's ear. However, the design of the instrument encourages a user to naturally grab the handle and utilize the brush. Further, a parent, peer, or other member of society likely demonstrated its utility for cleaning teeth, and they would likely discourage the instrument's use in socially unacceptable ways. Indeed, "objects have been shaped, even deliberately designed, through the intentional activities of others; they have a 'place' in relation to definite cultural practices and 'represent' various human purposes" (Costall, 1995, p. 476). Costall (1995) further argued that objects do not just happen to afford utility, they are meant to afford certain types of utility, and improper use can yield "sanctions against such deviation" (p. 472). Thus, affordances are present in everyday objects or tools; they have been intentionally designed; and their proper use can demonstrate introduction, participation, and acceptance into a social community.

As a framework, Affordance Theory (Gibson, 1979), allows for description and prediction of how objects, tools, or artifacts are designed to meet users' desires and how they could or should be perceived and used in socially significant ways. Affordance Theory has been applied to a wide variety of contexts such as psychology, education, information, and communication research (Bower, 2008; Conole & Dyke, 2004; Nagy & Neff, 2015). However, the theoretical framework has been found especially useful for studies of design (Maier & Fadel, 2009; Xenakis & Arnellos, 2013), and it has specifically been applied in mobile app research (Lloyd, 2018; Schwebs, 2014; Torma & Teusner, 2011; van Wyk & van Ryneveld, 2018).

When applied to mobile app design and use, Affordance Theory (Gibson, 1979) can describe an "entangled" relationship that forms between three fundamental entities: designers, artifacts, and users (Maier & Fadel, 2009). Maier and Fadel asserted that:

> In design, the entangled relationship between people and artifacts is inescapable, because artifacts are always designed for human use, usually designed by humans themselves (using computers and other tools), and situated within a larger context of a complex world economy…. These relationships are entangled, because the designer determines how the user uses the artifact through the structure of the artifact itself. Moreover, how the designer designs the artifact is motivated in part by the users' own demands and wishes. (p. 18)

Although an artifact, or specifically a mobile app, is intentionally designed to be used in certain ways, that does not necessarily mean that users will perceive and use designed affordances in the intended ways. Users may not be interested in, aware of, or able to actualize those affordances. Specifically, "an affordance must be measured relative to a user's abilities and needs: particular users have particular goals and expertise which drive their interaction with the artifact" (Ditzler et al., 2018, p. 21). Thus, different users may utilize app affordance in unintended ways based on their experience, motivation, or other attributes.

Therefore, when considering mobile apps, a conceptualized theoretical framework of Affordance Theory (Gibson, 1979) may articulate the relationship between at least four critical components: an artifact's or app's affordances, designers' intended affordances, users' perceptions and actions, and the context of social and cultural values that moderate interactions as shown in Figure 2-1.

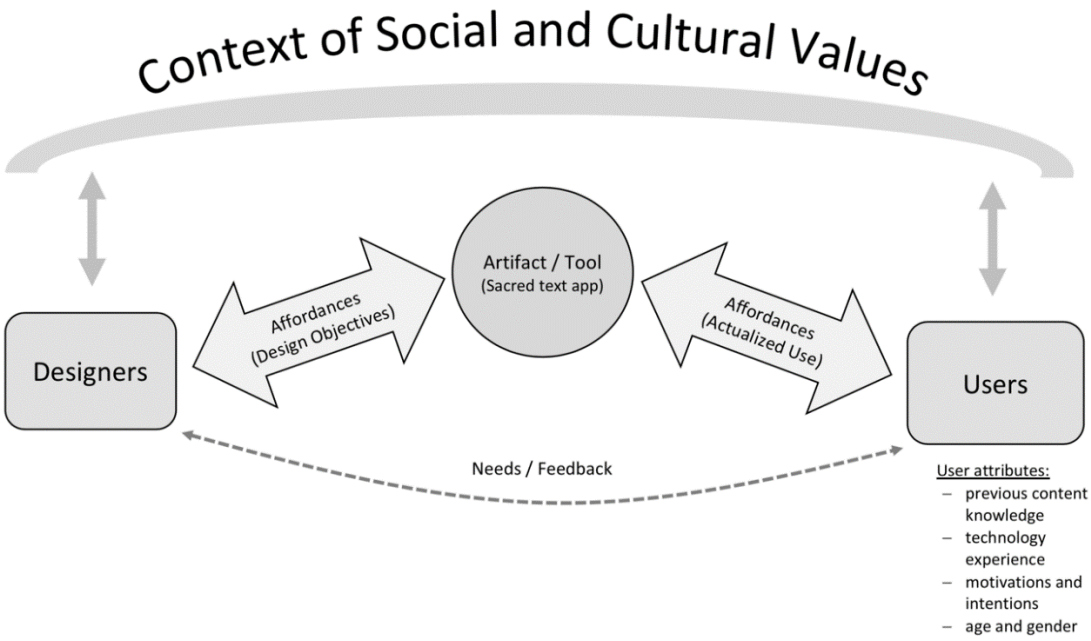

Figure 2-1. Conceptualized Theoretical Framework.

Religious Digital Text Affordances

Religious affordances have been defined as "the actions that are enabled, constrained, and/or restructured through technological elements" in religiously significant ways (Bellar, 2017, p. 339). Torma and Teusner (2011) have asserted, "new technologies are never value-free, but enter society laden with cultural values that impact their reception and use" (p. 138). Religious mobile apps are connected to religious and cultural values or norms because they are both designed and used for religious purposes, and religion is a culturally embedded endeavor. Some researchers have argued that sacred text apps are specifically designed to encourage, promote, and support reading practices associated with religious group values (Hutchings, 2017). For example, if a Bible app is designed to allow annotation or marking, then the designers are implying that annotation and marking are valued or good ways of reading the Bible. In contrast,

digital Qur'an app designers may intentionally choose to not include marking affordances because they may feel that it is not appropriate to mark the Qur'an (Svensson, 2010). Furthermore, Evangelical denominations can facilitate daily study and proselytizing by having daily reading reminders and sharing features embedded in apps designed by Evangelical groups. Thus, it may be argued that the design of digital sacred text apps implies and communicates religious, cultural, or group values and norms. The design tells users how they could read, interpret, use, and understand religious text. Moreover, digital sacred text apps may be designed to include or exclude certain affordances because users have provided feedback that they value certain types of affordances.

Religious digital text affordances can include features such as the following:

- annotating and marking,
- notifications, alerts, or reminders,
- feedback or performance reports,
- search functions,
- internal and external hyperlinking,
- study plans or paths,
- sharing and social dialogue capacities,
- audio or multimedia elements,
- location-based services, and
- several forms of customization.

The presence or absence of any of these affordances can imply valued forms of reading sacred text within a religious community. The use or disuse of any of these affordances can similarly demonstrate perceived and unperceived value or lack thereof. Hence,

designers and users can utilize a religious sacred text app to communicate to one another what forms of literacy are valued and important to them. Analyzing the designed and used affordances of a specific religious text app can aid in "uncovering the social values held by a group of people," discover the "social institutions of power and influence that promote and privilege these values," and inform "how humans connect with others, form groups and communities, and share identities" (Torma & Teusner, 2011, pp. 140-141).

Literature Search and Review

In order to collect scholarly articles relevant to digital reading of sacred text, search terms were used such as digital sacred text, digital spiritual text, religious reading, digital, religious reading and electronic, and e-reading and scripture. Combinations of these terms were used in the following databases accessed through EBSCOhost: Education Source, Academic Search Ultimate, ERIC, Psychology and Behavioral Sciences Collection, PsycINFO, Religion and Philosophy Collection. These searches yielded several hundred results as demonstrated in Table 2-1. Results were filtered by reading titles and abstracts. The nature of the search terms yielded many articles that were not relevant to this review such as "Analyzing Political Rhetoric in Conservative and Liberal Weblogs Related to the Construction of the 'Ground Zero Mosque'" or "Technology, Scripture, and Ecofeminism: The Wind and the Sea Respond". Articles that were applicable, relevant, or focused on reading sacred text digitally were retained for this review of the literature. Furthermore, only academic works were included such as peer-reviewed empirical studies, dissertations, and other scholarly articles or books.

Editorials, opinion pieces, or non-academic commentaries were noted, but excluded. Other inclusionary criteria included articles published in the last 30 years in English.

Subject terms from relevant articles were iteratively fed back into the database search engine until no new results were located. After the initial database searches began to yield no new results, references in identified articles were searched to accumulate additional articles regarding digital reading of scripture or sacred text. Lastly, all accrued articles were input to Google Scholar to identify works that had cited those articles as well as any other related research that Google Scholar might produce. Through this process, 20 articles were identified, including one book, two book chapters, and 10 empirical studies (Table 2-2). The 20 total articles were then read and systematically analyzed to identify common themes, findings, research components, and suggestions for future research. The following section will first outline major themes found across the identified articles followed by a systematic analysis of the 10 empirical studies.

Table 2-1

Search Terms and Numerical Results

Search terms	Total results	Applicable results	Unique results	Total cumulative articles
digital sacred text	31	4	4	4
digital spiritual text	26	2	0	4
religious reading AND digital text	88	3	1	5
religious reading AND electronic text	19	1	0	5
relig* AND read* AND digit*	394	4	1	6
relig* AND text AND digit*	227	5	1	7
spirit* AND text AND digit*	71	2	0	7
digital scripture	69	1	1	8
electronic scripture	192	2	0	8
digital bible	261	7	1	9
electronic bible reading	34	2	0	9
mobile bible	84	4	1	10
mobile sacred text	14	2	0	10
mobile scripture	18	2	0	10
technology scripture	174	3	0	10
technology bible	649	6	0	10
electronic sacred text	39	1	0	10
				Total cumulative articles

Table 2-2

Results from Searches

Articles Located from Database Searches	Type
Bellar, W. (2016). Private practice: Using digital diaries and interviews to understand evangelical Christians' choice and use of religious mobile applications. *New Media and Society*, *19*(1), 111–125. https://doi.org/10.1177/1461444816649922	Empirical Study
Gorichanaz, T. (2016). Experiencing the Bible. *Journal of Religious and Theological Information*, *15*(1–2), 19–31. https://doi.org/10.1080/10477845.2016.1168278	Empirical Study
Hutchings, T. (2017). Design and the digital Bible: persuasive technology and religious reading. *Journal of Contemporary Religion*, *32*(2), 205–219. https://doi.org/10.1080/13537903.2017.1298903	Empirical Study
Jacobs, A. (2011). Christianity and the future of the book. *The New Atlantis*, *Fall*, 19–36.	Academic Commentary
McClure, P. (2018). Modding my religion: Exploring the effects of digital technology on religion and spirituality (Doctoral dissertation). Retrieved from https://baylor-ir.tdl.org/handle/2104/10374	Dissertation
Mroczek, E. (2011). Thinking digitally about the Dead Sea Scrolls: Book history before and beyond the book. *Book History*, *14*(1), 241–269. https://doi.org/10.1353/bh.2011.0006	Academic Commentary
Odom, J. D. (2013). A study of the impact of mobile phones as learning tools for youth in Southern Baptist churches. *ProQuest LLC, Southwestern Baptist Theological Seminary*, (Doctoral Dissertation).	Dissertation
Preiss, D. (2009). Meaning-making in prayer: A model for the use of collaborative constructivist technology for spiritual engagement. *ProQuest Dissertations and Theses*, (Doctoral Dissertation).	Dissertation
Richardson, K. B., & Pardun, C. J. (2015). The new scroll digital devices, Bible study and worship. *Journal of Media and Religion*, *14*(1), 16–28. https://doi.org/10.1080/15348423.2015.1011984	Empirical Study
Siker, J. S. (2017). *Liquid scripture: The Bible in a digital world*. Minneapolis: Fortress Press.	Book

Table 2-2 Continued

Articles Located from References	Type
Campbell, H. (2007a). 'What hath God wrought?' Considering how religious communities culture (or Kosher) the cell phone. *Continuum*, *21*(2), 191–203. https://doi.org/10.1080/10304310701269040	Empirical Study
Campbell, H. (2007b). Who's got the power? Religious authority and the Internet. *Journal of Computer-Mediated Communication*, *12*(3), 1043–1062. https://doi.org/10.1111/j.1083-6101.2007.00362.x	Empirical Study
Campbell, H., Altenhofen, B., Bellar, W., & Cho, K. J. (2014). There's a religious app for that! A framework for studying religious mobile applications. *Mobile Media and Communication*, *2*(2), 154–172. https://doi.org/10.1177/2050157914520846	Empirical Study
Hutchings, T. (2014). Now the Bible is an app: Digital media and changing patterns of religious authority. In *Religion, Media, and Social Change* (pp. 143–161). https://doi.org/10.4324/9781315814339	Book Chapter
Hutchings, T. (2015a). E-Reading and the Christian Bible. *Studies in Religion/Sciences Religieuses*, *44*(4), 423–440. https://doi.org/10.1177/0008429815610607	Empirical Study
Hutchings, T. (2015b). Studying apps: Research approaches to the digital Bible. In *Digital Methodologies in the Sociology of Religion* (pp. 97–108). https://doi.org/10.5040/9781474256292.ch-009	Book Chapter
Torma, R., & Teusner, P. E. (2011). iReligion. *Studies in World Christianity*, *17*(2), 137–155. https://doi.org/10.3366/swc.2011.0017	Empirical Study
van Peursen, W. (2014). Is the Bible losing its covers? Conceptualization and use of the Bible on the threshold of the Digital Order. *HIPHIL Novum*, *1*(1), 44–58.	Academic Commentary

Articles Located from Google Scholar	Type
Phillips, P. (2018). The pixelated text: Reading the bible within digital culture. *Theology*, *121*(6), 403–412. https://doi.org/10.1177/0040571X18794139	Academic Commentary
Rinker, C. H., Roof, J., Harvey, E., Bailey, E., & Embler, H. (2016). Religious apps for smartphones and tablets: Transforming religious authority and the nature of religion. *Interdisciplinary Journal of Research on Religion*, *12*, 1–13.	Empirical Study

Increased Demand and Importance

One of the first noteworthy themes found across identified articles is a nearly consistent demonstration of the growing importance to understand the role of reading sacred text digitally (Hutchings, 2017; Jacobs, 2011; Richardson & Pardun, 2015). The demand for further research about the effects of digital reading is especially pertinent because there is a rapidly growing presence of digital reading devices and practices particularly in religious settings (Hutchings, 2014). Several scholars have noted a recent and swift surge towards mainstream acceptance in Christian denominations for reading the Bible on screens (Gorichanaz, 2016; Hutchings, 2015a, 2015b, 2017; Torma & Teusner, 2011).

In recent years, digital Bible study is much more common in private worship and public services (Bellar, 2016). Thus, there are calls to understand the design, use, and effects of digital Bibles and sacred texts across almost all major world religions (Campbell, 2007a, 2007b; Campbell et al., 2014). The global demand for digital scripture is highlighted by the fact that the most prevalent Christian Bible app, YouVersion, has been reportedly installed by users located in every country in its first five years of availability (Hutchings, 2014). Furthermore, YouVersion has made the Bible available in over 700 languages and has been installed hundreds of millions of times (Hutchings, 2015a). These figures may seem staggering as there are many other apps that make sacred text digitally available to a global religious community.

Although some believe that digital Bible reading is a pervasive practice among only young people, evidence suggests that there is an appeal across all ages. Using a survey and focus groups to collect data from 234 practicing Baptists, Richardson and

Pardun (2015) showed that religious people over 60 years old are recognizing and embracing the value of digital Bible study and worship. However, they also noted that teachers were generally more accepting toward the use of digital Bibles than regular church attendees. Importantly, those who found deep value in digital Bible access were reticent to say that screen-based Bible reading was superior in every way. As described in greater detail below, participants were quick to note that screen-based reading carried the extra baggage of constant potential distraction, such as e-mail notifications and other popup reminders, which could lessen their devotional reading experiences.

As digital devices and practices continue to assert a growing global presence, it should not be surprising that previously sacred books and practices will increasingly find a stronghold in the digital world. The Bible has historically been the most published and purchased book in print (Jeynes, 2010; Wachlin, 1998); it may reasonably continue a similar legacy in a digital age. Indeed, some have argued that "since Samuel Morse posed his famous question 'what hath God wrought?' in the first telegraph conversation, communication technology has been infused with spiritual undertones" (Campbell, 2007a, p. 191). Furthermore, others have asserted that the development of technology and religion have always walked hand-in-hand as religious communities have invented, popularized, and preserved many technologies such as clocks, codex, and printing press (Jacobs, 2011). Jacobs further predicts that growing technology and religion will continue to be connected because "Christians tend to be a proselytizing people, and the message that they bring will always be entangled with technologies of reading" (p. 36).

History, Technology, and Bible Reading

Many scholars have chronicled a long and interconnected history that ties religious practice to technological developments throughout antiquity. Even though the use of the word "scroll" evokes a modern perception of digital interaction with text, the word ironically has a much more archaic undertone that highlights the fact that sacred text was once literally stored and read as scrolls (Mroczek, 2011; Richardson & Pardun, 2015). Taking a step further back in time, parts of what we now call the Bible have been found on cuneiform (clay tablets), papyri scrolls, codex (bound paper books), and as printed text with the help of the printing press (Jacobs, 2011; Mroczek, 2011). Some historians have argued that these advancing changes in Biblical modality or formats have shifted the ways sacred text is read and interpreted (Mroczek, 2011).

Reading Scripture Non-linearly

For example, several scholars have opined that reading the Bible on a digital device encourages a non-linear approach as opposed to a more traditional or linear reading of the book from front cover to back cover (Beaudoin, 1998; Wagner, 2012, 2013). In this model, non-linear reading is facilitated by hypertext or links that the reader can easily click and navigate to other parts of the book. Additionally, the very absence of traditional book covers on a digital reading device implies that there is no correct path or bounded domain necessary to properly read, navigate, and interpret the text.

However, Mroczek (2011) and Siker (2017) have argued that the historical advent and development of codices over scrolls is what allowed early Christians to begin to search sacred writings in random-access or non-linear ways. The particular order of

books may be less relevant with a jar full of scrolls, but the reader must unroll and read from beginning to end in a defined path that the author has prescribed. In contrast, a bound hand-written codex book with pages or leaflets allows the reader to hold a finger in one page while flipping back and forth to other pages. Thus, readers are entitled to define their own reading path independent of a single author's intent. A codex takes unbound and transient individual scrolls and binds them into one unified and defined book, but it also allows an unbounded reader to navigate through those pages in a way that the original authors may not have conceived.

Furthermore, as the printing press made the Bible available to a broader audience, the interpretation of sacred text slowly left the hands of the traditional clergy and scribes into the prerogative of the common person (Siker, 2017). Indeed, the historical figure William Tyndale (1494-1536) may have famously captured the notion of changing scriptural authority with advancing technology when he taunted that he would cause the common boy who drives the plow to know more of the scriptures than the Pope (Moynahan, 2003). Tyndale wished to use the technology of his day to make the Bible linguistically accessible to the common English boy.

Modern Scripture Technology

In more recent times, the shifting substrate on which Biblical technology has developed and thus drawn academic attention is digital. Previous researchers and scholars have focused on reading digital sacred text through CD-ROM and the Internet, and, more recently, on mobile device applications or apps (Bellar, 2016; Richardson & Pardun, 2015; Siker, 2017). There has historically been a division between what has been labeled "study" tradition and "engagement" tradition in digital Bible research

(Hutchings, 2015b). The study tradition has emphasized more academic investigation by using computers to conduct word counts and textual analysis, and the engagement tradition has been emphasized in ecclesiastical or pastoral contexts where devotional or spiritual reading is prioritized (Siker, 2017). Thus, research in study traditions may focus on how the words of the Bible have changed over time, while research in engagement tradition may focus more on how the words of the Bible have changed or affected people over time.

Some of the more modern scholarly conversations have revolved around the notion of materiality and meaning. For example, Siker (2017) and others (Hutchings, 2015a; Richardson & Pardun, 2015) have observed that defining the sacred element of scripture can become ambiguously fluid. Is it the words that are sacred or is it the printed paper pages? Would it be just as culturally significant and appropriate for a president of the United States to be sworn into office by raising his arm and placing his other hand on an iPhone or tablet? Many people feel that having a tangible Bible on their bookshelves at home is their expression of sacred devotion, commitment, and faith (Gorichanaz, 2016). Yet, others feel that reading the words creates a sacred experience regardless of the format (van Peursen, 2014). Siker (2017) argued that "important connections exist between form and content, between the medium and the message, between the technological production of words and the meaning of words in varied contexts" (p. 8).

The interplay between religion, technology, and modality, is further demonstrated by Campbell (2007a) who argued that religion shapes technology as much as technology shapes religion. Campbell described how religious communities have adopted cell phone technology, as well as shaped the development of a "kosher" cell phone in Israel.

Although some groups criticize or outright reject the use of digital phone technology in religious practice, most groups, such as the Amish, undergo a process of social shaping of technology in which they resist then reconstruct the proper use of technology. Specifically, Campbell reported previous research showing an Amish group not allowing phones in private homes, but instead they required phones to be accessed only in public community centers. Furthermore, Campbell described the development of a culturally acceptable or kosher cell phone initially designed by Motorola for ultra-Orthodox Jews in Israel. The kosher phone, with limited accessibility to "secular media-entertainment culture" and stamped with rabbinical approval, shows that religious values and communities can shape the way technology is developed and used. Moreover, the affordances and limitations of digital technology are mediated by the value or sacredness that a group assigns and holds to its cultural behaviors and practices. In other words, it may be argued that technology "has little universal meaning apart from that which is constructed or negotiated by those social groups who make use of it" (Zimmerman-Umble, 1992, p. 183).

Denominational Differences and Religious Values

Any investigation into reading sacred text, whether digital or print, must consider the religious or social values held by readers. Simply put, not all religious groups approach reading sacred text in the same way, not even all Christians approach the Bible in the same way. Siker (2017) noted different denominational approaches to sacredness and reading of scripture:

> It is no accident that the authority of the Bible is paramount within the Protestant tradition (*sola scriptura*), where the Bible is physically present

> in every pew for the faithful to study and read. By contrast, the authority of the Bible in the Roman Catholic tradition is secondary to the authority of the teaching magisterium, which offers officially sanctioned interpretations of the Bible as part of the tradition, which the teaching authority of the church mediates to the faithful. As the Vatican II document *Dei Verbum* ("Dogmatic Constitution on Divine Revelation," 1965) stated clearly, the Bible means what the teaching authority of the church says it means. No wonder, then, that in Roman Catholic churches, the Bible is not to be found in the pews, but is read aloud from the lectern. (pp. 7-8)

Evangelical and Protestant

To date, most published research on digital sacred text has focused on the Christian Bible, and within Christianity, Evangelical and Protestant denominations have received the most attention. Bellar (2016) has contended that "Evangelicals have a special relationship to print media, as it is the main format through which they engage in the literal Word of God" (p. 113). However, there is still much diversity and internal contradiction within Evangelical approaches to the literal words of scripture. Hutchings (2017) suggested that Evangelical values are embedded into the design of some of the most popular Bible apps. Hutchings argued that in order to understand how digital Bibles are different than print, "one must first appreciate the distinctive ways in which Evangelicals use their printed Bibles, paying particular attention to practices of reading and interpretation that rely on the medium of paper" (p. 207). Evangelicals tend to value frequent or daily personal reading of the Bible, and they tend to view scripture reading as a "dual-context communication event" in which they expect direction from God on how to apply Biblical principles into their lives (Malley, 2004). Additionally, Evangelicals are motivated to share the words and message of the Bible with the world. Believing Evangelicals often display their faith by a well-worn and heavily marked Bible.

Catholic

Alternatively, as a practicing Catholic in America, Gorichanaz (2016) conducted interviews with six fellow Catholics to understand their experience with the Bible. Several participants reported that they viewed frequent Bible reading as an important personal practice; yet, they perceived that their Bible reading practice was atypical of most Catholics. Participants believed that regular Bible reading was generally more common among Protestants. When asked about the last time they read the Bible, many participants recounted hearing the Bible read at Mass, demonstrating value for oral transmission of the text. Furthermore, Siker (2017) argued that Protestants are generally more open to a multitude of diverse Bible translations and commentaries which Catholics are less inclined to value. Digital Bibles directed towards Protestants tend to promise new ideas, creativity, and inspiration; whereas digital Bibles designed for Catholic audiences claim to promote learning, discovering, and exploring of answers already set out by Catholic authorities (Hutchings, 2015c).

Physical Materiality

Most studies report that well over 70% of Christians, regardless of denomination, seem open to accessing the Bible through multiple formats such as print text, digital text, audio, or video (Gorichanaz, 2016; Hutchings, 2017; Rinker, Roof, Harvey, Bailey, & Embler, 2016). However, studies also suggest that the majority of Christians feel there is still something special about the physical presence of a tangible Bible that can evoke holiness by its mere presence (Hutchings, 2015a; Richardson & Pardun, 2015; van Peursen, 2014). A physical Bible in hand or on a bookshelf can not only be an outward

expression of faith, but it often becomes an heirloom enhancing more serious contemplation of the past and a connection to present life or into the future. Some have reported that a physical Bible helps readers pay more attention, feel more connected to the text, and be more inclined to record, mark, or annotate (Gorichanaz, 2016).

Scripture Materiality Throughout the World

Reverence for the physical materiality of sacred text may be highlighted by the ways in which many Muslims and Jews honor scripture. In her book describing the ritualistic care of religious texts throughout the world, Myrvold (2010) explained "Jewish and Muslim friends told me that old Torah scrolls are given separate graves in the cemetery and worn-out copies of the Qur'an are either burnt or buried in tombs" (p. 1). Indeed, many faith traditions across the planet hold reverent rituals for the use and retirement of sacred texts. For example, Buddhists place sacred manuscripts inside statues of Buddha for future preservation, Hindus often send damaged editions of religious texts downriver, and Sikh adherents hold cremations at regular intervals (Myrvold, 2010).

Notwithstanding long-standing reverence for tangible sacred text, religious communities face several obstacles introduced by a global digital revolution. How should sacred text be reverenced by faithful religious adherents when it is just another app on their mobile phone? Are there appropriate ways for a Muslim to navigate the use or retirement of their digital Qur'an? A few specific examples may serve to elucidate this quandary.

Questionnaires distributed to 137 secondary-school Muslims in Kisumu revealed that in their view the second worse Islamic sin that could be committed was touching the

Qur'an in a state of impurity (Svensson, 2010). Many Muslims throughout the world recognize that the Qur'an should never be placed on the floor, taken into impure spaces such as bathrooms, desecrated through reckless marking and annotation, or touched while the reader is unclean. Ritual impurity can be caused by unwashed hands and body, menstruation, or infidelity. Yet, how do these qualifying parameters apply to digital copies of the Qur'an? Is it permissible to set a mobile device with a Qur'an app on the floor, and is it acceptable to mark or annotate a digital copy of the sacred Qur'an text? Svensson (2010) further clarified how some of these questions have been addressed.

> At an Islamic club meeting at Kisumu Boys' high School in 2006, the question was posed on how to relate to Qur'anic software on mobile phones. May the device, for example, be carried when visiting the toilet? The consensus was reached that it may not, albeit some reservation was raised regarding the risk of theft if the device was left outside. At the website "Ask Imam" several questions of this character have been presented, and the *fatwas* issued [a ruling on a point of Islamic law given by a recognized authority] provide an interesting perspective to query the location of sacredness. On a general level it is the display of Arabic letters/script on a screen that is perceived as problematic. Therefore, the *fatwas* assert that if a person is in a state of ritual impurity he or she should not touch the screen of the device (for example, mobile phone, PDA, or computer screen). There is no problem, however, in touching other parts of the device or the screen if the sacred text is not displayed at that moment. (p. 47)

On the other hand, there are religious groups such as the Masowe Apostolics in Zimbabwe Africa that are known as the "Christians who don't read the Bible" (Engelke, 2004). In their uncommon view, Biblical text is a tool of colonialism that separates them from a direct relationship with God. Therefore, reverence and reading of sacred text is irrelevant to Masowe. Thus, an empirical investigation into digital reading behaviors of the Masowe would likely yield drastically different results than Muslims in Kisumu or Protestant Christians in America. Furthermore, Evangelical Christians, who value a well-

worn and heavily marked Bible, likely read sacred text differently than either Masowe or Muslims.

Responding to Religious Differences

Campbell et al. (2014) asserted that across many different world religions (Buddhism, Christianity, Hinduism, Islam, Judaism) there are a number of varying design outcomes and intended usage patterns to which app developers respond. Based on specific group values and practices, religious apps may be designed to assist readers with engaging text, prayer, meditation, worship, ritual practice, or connecting socially. Christian, Jewish, and Muslim apps (monotheist Abrahamic religions) tend to centralize around textual engagement, while Buddhist and Hindu focus more on lifestyle. Christians specifically have been known as "people of the book" nearly since inception (Jacobs, 2011), even though they do not all approach the Bible in the same way.

Therefore, a study of digital sacred text reading must be conducted in context of, or at least with awareness and consideration for, specific group religious values and norms. Siker (2017) used Fish's (1982) somewhat contended work to assert that "texts have no real meaning apart from communities that value and interpret texts, and that the notion of authorial intent is a fiction imposed on a text by a community of readers" (Siker, 2017, p. 125). Regardless of whether authorial intent is something constructed by the reader or prescribed by the author, prior research strongly suggests that a reader's social and religious community values effect the experience of reading sacred text.

Changing Traditional Authority

Many authors who have taken an interest in digital sacred text have addressed concerns of shifting traditional religious authority and hierarchal structures. Several commentators and scholars have opined that the digital revolution will continue to erode long-held views of religious institutions and organizations. Whereas institutional authority figures were once the gatekeepers of knowledge and understanding, now any blogger or website author with an opinion can be perceived as an expert in the field. Furthermore, with peer-to-peer interactions facilitated through messaging platforms or social media, some writers fear that collectively pooled ignorance prevails instead of systematic and carefully crafted knowledge. However, others assert that digital environments such as apps and websites maintain the status quo of religious authority and norms by simply shifting the same traditions to a new digital field. At any rate, a central question is considered in several articles retrieved for this review, namely, are power and authority structures challenged by digital scriptures?

Possible Erosion of Traditional Authority

On one side of the argument, Beaudoin (1998) and Wagner (2012) have asserted that digital sacred text has no real boundaries because a reader can unendingly navigate through hypertext links without ever reaching the conclusion intended by the original author. In this view, digital Bibles have become fluid without literal covers or metaphorical beginning and ending points. Thus, readers are free to create their own flexible interpretation of sacred text. Furthermore, digital Bible apps are often saturated with additional resources, content, and commentaries. If readers do not like a specific

interpretation given in a particular commentary or Bible translation, they are free to find one that does fit their own personal worldview from among the myriad other digital resources. Wagner contended that religious mobile apps "place control in the hands of individual users" (Wagner, 2013, p. 202), thereby "shifting authority from the institution to the individual" (Hutchings, 2015a, p. 425). Hutchings (2014) summarized this position:

> There are two underlying ideas here: media technology, particularly digital media, empowers users to access a wider range of information and resources while bypassing traditional gate-keepers; and users will take advantage of this technologically-empowered freedom to develop less conservative ideas and less hierarchical forms of social organization. (p. 10)

Even if digital devices are used while attending a traditional worship service, studies suggest they are frequently used to fact-check the preacher and thus present an immediate challenge to authority (Richardson & Pardun, 2015).

Rinker et al. (2016) have demonstrated that college students' perceptions of religious authority figures are shifting away from traditional organized religions, pastors, and other faith-based leaders. Instead, young adults are turning to religious apps for guidance in lifestyle and worship. This shift is making religion more private and individualized. However, the work of Rinker et al. also ironically shows that college-aged students are installing religious apps because they want to stay connected to their faith-based social community. Therefore, it may reasonably be argued that religious apps are a way for traditional faith authority figures to stay connected and relevant to a younger generation.

To further nuance the conversation, Campbell (2007b) interviewed several Christians, Jews, and Muslims and found that authority is not perceived in the same ways

across all faith traditions. Campbell argued that authority should be separated into terms of hierarchy, structure, ideology, and text. For example, practicing Jews and Muslims in the study were more apt to feel that general Internet usage reinforced the role of traditional religious leaders such as rabbis and imams by giving them a greater voice or platform to communicate the faith's beliefs and practices. However, Christians and non-religious/practicing Jews reported that Internet usage lessened their deference to traditional religious leaders. Despite the perception that the Internet decreased respect for traditional hierarchy, Christians generally applauded the creation of a common authoritative ideology among a larger global community or Church through the use of the Internet. Therefore, Campbell asserted that researchers interested in addressing authority must specify an aspect of authority (hierarchy or ideology) within specific faith traditions (Jew or Christian). Campbell reported that the greatest gap in the current research exists with the role and perceptions of digital or Internet-based religious texts across different religious groups.

Modifying Traditional Authority

In stark contrast to the notion that digital sacred text deconstructs traditional authority structures, some have argued that it actually reinforces long-held values of religious institutions and leaders. Hutchings (2017) contended that digital Bible apps are a form of "persuasive technology" (Fogg, 2003), which are designed to reinforce traditionally held values, beliefs, practices, and authority figures. Specifically, the most widely utilized Bible apps, such as YouVersion, "train the user in traditional Evangelical Christian understandings of the work of reading" (p. 205) and encourage "greater commitment to an Evangelical understanding of the text's authority" (p. 213). In

Hutchings' view, the ways that users are led through the text with daily notifications, annotations, available supplementary sermons, and so forth actually brings readers into a particular faith-based community of practice.

The work of Bellar (2016) and Rinker et al. (2016) may be seen to support the idea of a digital revolution modifying but ultimately reinstating traditional faith-based authority. Bellar and Rinker et al. demonstrated that a desire to rely on and stay connected with participants' traditional faith-based community can be one of the primary motivating factors for downloading and using religious apps. Bellar specifically described a reliance on previously established religious relationships that aided participants' decisions about which apps to download and how to use them. Bellar builds on the work of Wagner (2013) who argued that individual religious identity is shaped by the apps we choose to download and use. However, it remains to be seen how much or in what ways apps reshape our identity, or how much our religious identity determines which apps we choose to download and use. What does seem clear is that religious apps are intentionally designed to respond to particular religious groups, their traditional reading practices, and religious lifestyle (Campbell et al., 2014; Hutchings, 2014, 2015b, 2017).

Methodological Approaches, Results, and Limitations

Of the 20 articles, chapters, and resources identified for this literature review, only 10 were empirical in nature and peer-reviewed, as shown in Table 2-3. The remaining were academic commentary or historical narratives (4), dissertations (3), book chapters (2), and one book. Previous studies about digital sacred text have almost

exclusively used qualitative approaches, utilizing interviews, surveys, focus groups, diary reports, interpretive phenomenological analysis, and design analysis of apps. The following section outlines a synthesized analysis of the peer-reviewed empirical studies identified for this literature review.

Religious App Design and Use

There is a notable distinction in previous research between focusing on the app itself and how users engage with the app. For example, Hutchings (2017) analyzed the design of two popular Christian Bible apps as case studies to demonstrate the implicitly reinforced denominational values imposed on readers. Hutchings argued that Bible app design is not value-free, and traditional Evangelical values are reinforced by the design of popular apps. Campbell, Altenhofen, and Bellar (2014) utilized a systematic rubric to analyze the design and categorization of 451 religious apps available on the iTunes app store based on the apps' designed functions and purposes. For their study, as many religious apps as possible were found by conducting searches with keywords such as "religion" and "spirituality," then results were narrowed to apps that focus on the five major world religions. After conducting a systematic thematic analysis, they found that cataloging of religious apps on iTunes at the time was grossly underdeveloped and unresponsive to the diversity of design intentions of religious apps because categories such as Reference or Lifestyle were too general. Campbell et al. concluded that, based on design intentions, religious apps fall into main groups, apps oriented around religious practice and apps embedded with religious content.

Table 2-3

Empirical Studies of Digital Sacred Text and Religious Apps

Sampling Source	N	Participants / Focus	Topic
Facebook and church flyers	20 (15 females, 5 males)	Evangelical Christian adults in US	User choices
Case study	1	"Kosher"phone in Israel	Design
Previous dataset	3 interviews with 7 participants each	Christians, Jews, and Muslims online and in Israel	Authority
iTunes app store	451	Religious apps	App design
Convenience and snowballing	6 (4 females, 2 males)	Catholics adults in Eastern US	User perceptions
SurveyMonkey distributed online	257 (118 females, 139 males)	Digital Bible users in US and UK	User perceptions
Popular Bible apps	2	Bible apps	App design
Qualtrics e-mail list. Convenience.	234 survey respondents. 3 focus groups.	Religious Baptist adults in US	User perceptions
Campus flyers and announcements	13 (12 females, 1 male)	Christian and Muslim university students in eastern US	Authority
iTunes app store	3	iPhone apps	App design

Table 2-3 Continued

Author and Abbreviated Title	Theoretical Framework	Measures
Bellar (2016) Private practice,	Networked religion	Digital diary reports and interviews
Campbell (2007a) What hath God wrought?	Social shaping of technology	Phenomenon case study
Campbell (2007b) Who's got the power?	Authority	Interviews
Campbell et al. (2014) There's a religious app for that!	Typology	Design categorization
Gorichanaz (2016) Experiencing the Bible.	Interpretive phenomenological analysis	Small group semi-structured interviews
Hutchings (2015) E-reading and the Christian Bible.	Descriptive	Survey
Hutchings (2017) Design and the digital Bible,	Persuasive technologies and procedural rhetoric	Analysis of app design, designer interviews, and marketing material
Richardson and Pardun (2015) The new scroll digital devices,	Technology impact on religious practice	Survey and focus groups
Rinker et al. (2016) Religious apps for smartphones,	Anthropological communities	Semi-structured interviews
Torma and Teusner (2011) iReligion.	Aesthetics	Researcher developed design analysis

On the other hand, researchers such as Bellar (2016) focused on the app user or audience. Bellar looked at the way readers choose religious apps and how their app interaction influences their religious identity. Bellar requested 20 users (15 females and 5 males, aged 22-64 years, recruited through Facebook and church flyers) to reflect on their choice of a religious app by asking users to record their decision process and app usage in a digital diary. Subsequent semi-structured in-depth interviews were conducted with participants so that their choices, usage patterns, and meaning-making experiences could be more fully captured and assessed. These data were coded and analyzed using the framework, 'networked religion,' which provides a way to conceptualize how users see themselves in relation to an online and offline religious community through five traits: storied identity, networked community, shifting authority, convergent practice, and multisite reality. Bellar found that users chose apps through word of mouth or through suggestions from friends, family, or other members of their religious groups. Users also favored apps that reinforced their existing religious values such as encouraging frequent Bible reading through easier and more convenient accessibility and increased accountability. Bellar concluded that this work contributes to the growing field in an important way by introducing data from actual users.

The distinction between research centered on either apps or users is further explicated by Hutchings (2015b). In his chapter overviewing research approaches to the digital Bible, Hutchings noted that future research could focus on designers' intentions and motivations, the way users interact with an app, or an intersection of apps' technological limitations and affordances. Torma and Teusner's (2011) work would fall into the category of analyzing technological limitations and affordances within religious

app design. In their view, an iPhone is a digital device with implicit cultural, aesthetic, and haptic values. Therefore, Torma and Teusner analyzed the design of three religious apps on an iPhone to consider how users might be limited or encouraged to interact with the app content. Using predetermined criteria, three religious apps were selected and then analyzed by describing the user interface and information architecture. They described how app-user interactions could be moderated based on menu placement and size, finger-based scrolling and navigation, use of media such as video or audio, font and format options, and other device affordances such as group messaging and app design features. However, Torma and Teusner never studied how real users actually used or interacted with those apps.

Religious App Users

Few studies to date have focused on the religious app user and their experience or usage patterns. Recognizing the burgeoning possibilities of a nascent field, Gorichanaz (2016) conducted an interpretive phenomenological analysis of interviews to examine the experience of six Bible-reading Catholics, aged 40 to 70 years. Semi-structured interviews were used in which religiously similar participants were asked about the last time they read from the Bible and about their experience with Bibles in digital formats. Participants reported that the Bible plays an important role in their personal and spiritual lives as God's Word, even though they perceive Bible reading as more common among Protestants than Catholics. Nevertheless, participants valued the physical materiality of a paper Bible as well as digital formats because both ostensibly enhance connections from God's Word into their lives and represent an ongoing spiritual journey and religious practice. Gorichanaz noted that a phenomenological analysis is an important exploratory

and descriptive beginning as robust theoretical stances have not yet been developed to describe or explain the experience of digital sacred text readers. Gorichanaz hoped that future research would build on previous work to further understand how the Bible is experienced by different age groups from other faith traditions. If there are important differences in the experience of a digital and print Bible, why and where are those differences?

Richardson and Pardun's (2015) survey of 234 practicing Baptists focused on users, but only inasmuch as it captured the perceptions of religious people regarding mobile technology in religious settings. Baptists were selected as the best sample population because they compose 17% of the total US population and about one-third of all Protestants. Richardson and Pardun further utilized three focus groups with a different group of participants to better understand the survey data previously collected. All participants were adults, with the majority (59%) being over 50 years old. About 75% of respondents reported using digital technology to study the Bible at home, 94% reported using technology to study the Bible while traveling, and almost half (49%) used digital devices to study religious material at church. In fact, many participants expressed mixed frustration and excitement with the use of screen-based Bibles in religious worship settings. Richardson and Pardun summarized the expressed perceptions of participants into three themes: convenience counts, digital distracts, sacred scroll. To clarify, participants reported that the convenience of having constant digital access to the Bible outweighed many negative side effects, the largest negative effect being the huge potential for distraction posed by a multifunctioning digital screen. Regardless of the format, respondents felt the words of the Bible to be sacred and to hold important value

in their lives, even though some expressed it was easier to maintain this devotional feeling, conviction, and authoritative respect with a print-based Bible. Richardson and Pardun recognized that their study is exploratory and limited. Their study could be extended in the future through collecting data from a more diverse age range of participants, as well as other faith traditions. Furthermore, both survey and focus group methodologies have inherent limitations because participants self-report their own behaviors. Future research could utilize methodologies that capture user behaviors more objectively and studies could look at not just whether technology is used and accepted in religious settings, but how it is used with documentation of the associated effects.

Hutchings (2015a) similarly conducted an online survey of 257 digital-Bible users in the United States and United Kingdom. Readers were asked about their perceptions of the advantages and disadvantages of their digital Bible by answering several introductory survey questions and one open-ended question. Specifically, digital Bible readers were asked, "In what ways (if any) have digital media changed your relationship with the Bible?" More males responded to the survey (61% of total participants), and they also reported using digital Bibles in ways different than most females indicated. Male respondents "claimed to read their Bibles more frequently and with greater use of study tools" (p. 431) than did their female counterparts. Moreover, age proved to be a notable demographic distinction among respondents, only 3.5% were younger than 21 years, 18% over 50, and the majority 59% between age 21 and 39. Regardless of age or gender, several positive and negative themes were identified. Participants reported that digital technology had changed their relationship with the Bible by making it easier and more convenient to access, providing more online social interaction, and potentially increasing

their frequency of reading. Negative effects included a loss of the unique and sacred status of a tangible Bible, worries of isolated or decontextualized reading, less prayer-based devotional reading, and distractions that can easily occur from other notifications, messages, and apps. Like Gorichanaz (2016), Hutchings hoped this preliminary data would inspire and open future research questions and detailed studies of religious e-reading, including collecting data on gender and age or prior religious experience.

Another example of an empirical study that focused on religious app users is Rinker et al. (2016). In that study, semi-structured interviews were conducted with 12 female university students and 1 male faculty member about their use of religious apps. Both Muslim and Christian participants were asked what types of religious apps they use, how they found the apps, and why they use them. Similar to Bellar (2016), Rinker et al. found that religious apps were largely chosen through a reliance on existing religious and social networks. However, there seems to be a shift away from deference for traditional hierarchical authority figures as more religious app users rely on peers for guidance. Participants reported they selected and used religious apps instead of attending traditional in-person service because of the busyness of their lives and the convenience of mobile device affordances.

Methodological Limitations and Possible Responses

Taken together, these studies offer an initial foundation of research on digital sacred text by presenting preliminary findings and noting the need for more rigorous inquiry. A noteworthy limitation in the located studies on religious app users is an exclusive reliance on self-reported data from users. Even studies that did not investigate religious app users per se utilized self-reported data from interviews or similar methods.

For example, Campbell (2007b) used self-reported data from interviews with Christians, Jews, and Muslims to understand their views on shifts in hierarchical and textual authority in the digital age. Future research could certainly continue to rely on users' self-reported data especially as such can clarify their perceptions and experiences; however, future studies could incorporate additional measures to promote increased understanding of the ways readers approach or read digital sacred text. Furthermore, previous scholars have looked at either the design or to some extent the users and their perceptions, but no one has simultaneously considered the design and how users actually interact with a specific sacred text app or within a specific religious group.

In a chapter outlining research approaches to studying digital Bibles, Hutchings (2015b) described several methodologies that have been employed in the past and that could be utilized better to overcome previous limitations. Hutchings illustrated and elaborated four specific methodologies: interviews, surveys, ethnographies, and data analysis. Interviews with app designers and users have proven useful to understand design intentions and self-reported perceptions of app users. However, further exploration is needed in actual app user behavior or usage patterns. Similarly, several surveys have been conducted that have allowed users to self-report their perceptions and experience with digital Bibles. Though valuable, interviews and surveys are limited because participants are likely to report information based on how they biasedly perceive themselves and how they wish a researcher to perceive them. Hutchings further argued that ethnographic methodologies could be one way to overcome the limitations of self-reported data generated from users with interviews and surveys. Ethnographies require a researcher to observe a groups' behaviors or beliefs by becoming a part of that group and

participating as a member. Ethnographies could also contribute data that do not directly rely on Bible app designers or users reporting their own behaviors, actions, or stated values. Recognizing that ethnographies may narrow the scope of a study, Hutchings postulated that participant-observer researchers might be able to offer "richer, more nuanced source of data" (p. 102).

Hutchings (2015b) labeled the fourth potential methodological approach as 'data analysis' because it would entail researchers analyzing data previously collected by Bible app designers or companies. If research can prove useful and ethical to digital Bible designers and companies, then perhaps those stakeholders would give researchers access to data gathered as part of their normal operational practices. Hutchings observed, "if academics can persuade Bible software companies that their research skills are useful enough to merit access to user data, then we may begin to see some truly remarkable new frontiers of research" (p. 108). Allowing researchers to quantitatively and critically analyze data gathered by companies could simultaneously contribute more robust findings to the field while giving companies crucial insights to their users. However, Hutchings notes there are ethical concerns that need to be identified, addressed, and mitigated. For example, companies might hesitate to offer data that may show negatively on company performance. Furthermore, the delineation between public and private information needs to be clearly understood and marked to protect the vulnerabilities of both designers and users.

Summary and Synthesis of Findings

This section will briefly summarize and synthesize the findings of extant empirical research targeting digital sacred text. These findings can be summarized into two categories: findings about the design of religious apps and findings about the users of religious apps. Findings regarding users can be further categorized into user behaviors, perceptions of advantages, and perceptions of disadvantages of using digital technology with sacred text.

Findings on Design

The most salient observation about the design of digital religious apps is that they are intentionally designed to respond to the needs of specific religious groups. Hutchings (2017), for example, demonstrated that some of the most popular Bible apps are designed to reinforce Evangelical reading approaches and values. Campbell et al. (2014) showed that in addition to sacred text apps, there are many different types of religious apps that are designed to respond to the cultural values and practices of particular religious groups. Torma and Teusner (2011) argued that religious app designers use the affordances of app devices such as iPhones to design sacred text apps that are aesthetically appealing to specific religious audiences. Torma and Teusner used "aesthetics" in this context to mean a framework to help uncover "the social values held by a group of people, which would lead them to hold certain objects as more beautiful, worthy of appreciation, important, and so on, than others" (p. 140). Campbell's (2007a) work on the "Kosher" phone contributes to an understanding that sometimes the values and practices of the religious group shape or modify the design of technology before it is adopted. Taken

together, these studies can demonstrate that religious apps, including those for digital sacred text, are not developed, designed, and distributed in a vacuum; they are mediated through the religious practices and values of the app users.

Findings on Users

One of the clearest pictures that has formed from research on users of digital sacred text is that convenience is perhaps the biggest value gained from religious apps. Specifically, when users are asked about their experience utilizing digital apps for scripture reading they overwhelmingly report that it is more convenient to access digital sacred text in their busy lives (Bellar, 2016; Gorichanaz, 2016; Hutchings, 2015a; Richardson & Pardun, 2015; Rinker et al., 2016). In addition to convenience, further advantages of digital scripture have been reported such as "easier to access, easier to study, open to online conversation, and at least some read it more frequently" (Hutchings, 2015a, p. 437). Participants in several studies reported using digital sacred text apps not only because they are nearly always on hand, but they also more quickly open up other resources such as alternate translations, social connectivity, reminders, and audio-visual presentations.

Perceived Disadvantages. In contrast, one overwhelming disadvantage is reported across studies of digital sacred text, namely distraction. Nearly every study that asked users to report their perceptions of digital text captured that readers on digital devices are more distracted by a multitude of study resources and a cacophony of other non-related apps and notifications (Gorichanaz, 2016; Hutchings, 2015a; Richardson & Pardun, 2015). Furthermore, other previously noted disadvantages to digital sacred text reported by digital Bible readers include perceptions that the Bible had "lost its status as a

unique and sacred object, worried that they were beginning to read isolated verses without understanding their wider context, and regretted the loss of a meaningful relationship with a physical object" (Hutchings, 2015a, p. 437).

In addition, reading scripture on a mobile phone or similar device may deprive readers of an important mode of Christian witnessing, encourage shallower scanning, and make it more difficult to memorize passages and remember where passages are located within the larger library of scripture (Hutchings, 2015a). Gorichanaz (2016) reported that digital Bible readers may also be less likely to take notes, highlight, or underline when reading electronic scriptures. Notwithstanding a respect for the words of scripture regardless of format, some digital readers report feeling more devotionally connected and reading more deeply with a printed Bible which may connect to a previously noted increased sense of permeance as a physical sacred object in a home, as a gift, or simply as a dedicated religious object (Gorichanaz, 2016; Richardson & Pardun, 2015).

Importance of Connectivity. Despite obvious disadvantages to digital sacred text, the notion of connectivity remains an important construct in the minds of many readers. Specifically, readers of sacred text, whether digital or print, desire and report feeling a connection to a divine higher power through reading scripture (Gorichanaz, 2016); and, as previously observed, many religious app users report downloading sacred text apps to stay connected to their faith values and traditions (Bellar, 2016; Rinker et al., 2016). Current research suggests that even though digital sacred text is not superior in every way, the practice of digital scripture reading will likely continue to grow because readers want to stay connected amid their busy lives. Indeed, a synthesized summary of research findings suggests the important question may not be "which is better, digital or

printed scripture," but "which facilitates more meaningful connections for whom and in what settings?"

Siker (2017) summarized several empirical studies of digital sacred text with four conclusions. First, digital scripture reading as a practice has exploded in recent years and will likely continue to grow. Second, print books and print Bibles will probably always have a place and are not likely going away. Third, "people tend to rely more on paper for deep reading, while they tend to rely more on screens for scanning and surfing" (p. 112). Fourth, "finding helpful objective (i.e., not self-reporting) qualitative measures for evaluating the use and impact of digital Bibles is difficult," (p. 112) and future research is needed to validate, nuance, or challenge the current (largely anecdotal) state of the field.

Calls for Future Research

Several scholars have claimed that there is a paucity of information on the effects of digital scripture reading and research has only recently developed while the practice in society has been quickly growing. Therefore, researchers have called for future investigation into a large range of areas within digital sacred text including effects on: identity (Bellar, 2016), power structures of societal authority (Campbell, 2007b; Hutchings, 2014, 2017; Rinker et al., 2016), technology development (Campbell, 2007a), materiality culture in religion and spirituality (Gorichanaz, 2016), comprehension, and retention (Hutchings, 2015a).

However, several future directions have been outlined that are more directly pertinent to the focus of this review such as religious app design intentions (Hutchings, 2017), actual user behaviors (Campbell et al., 2014; Hutchings, 2015a), and comparative

experiences between digital and print reading across different denominations (Gorichanaz, 2016; Richardson & Pardun, 2015). One of the most frequent requests is a call for more research across different faith communities and age ranges including larger sample sizes that take gender into account (Campbell, 2007b; Gorichanaz, 2016; Hutchings, 2015a; Rinker et al., 2016; Torma & Teusner, 2011). Several studies claim to be exploratory or introductory in nature, and authors hope that future research can demographically expand on their preliminary foundation (Bellar, 2016; Gorichanaz, 2016; Hutchings, 2015a; Richardson & Pardun, 2015). For example, after reporting results of Catholics' experience with digital Bibles, Gorichanaz (2016) asserted that "to address the question of how Bible readers experience the Bible in different print and electronic formats, it would be informative to study different age groups, which may have different relationships to digital media." Furthermore, "it would also be illuminating to explore how different faith traditions experience the Bible" (p. 29). After noting claimed behavioral differences between genders in his own survey research, Hutchings (2015a) made the following observations:

> Mia Lövheim has drawn attention, in a recent edited volume (Lövheim, 2013), to the failure of the field of religion, media and culture to attend properly to questions of gender, and future study of reading practices should take this provocation to heart. Age and religious expertise are also matters of interest for future research. My survey respondents were almost all frequent churchgoers and frequent Bible-readers, and their use of digital Bible technologies must be understood in the context of extensive religious experience. Studies of non-religious e-reading have frequently focused on school- and college-aged users, and this remains a gap in our understanding of religious e-reading. (pp. 437-438)

Evangelical, Baptist, and Catholic experiences with digital Bibles have been preliminarily studied within Christianity. However, given important differences that can exist across denominations, what about others such as Methodists, Jehovah's Witnesses,

or Latter-day Saints? Moreover, do young Methodists experience and read digital Bibles in the same ways or with the same effects as older and more experienced Bible-reading Methodists?

Surprisingly, even though there is little known about how readers perceive or experience digital sacred text differently than print, there is even less known or reported about how users actually read or interact with digital sacred text. Evidence suggests that digital text is often read more shallowly, with less deference, and with greater decontextualized isolation than its print counterpart (Gorichanaz, 2016; Hutchings, 2015a; Liu, 2005), but is this true of digital sacred text such as the Bible? Moreover, studies have shown that religious apps are designed to guide readers through sacred text in denominationally specific ways (Hutchings, 2017; Torma & Teusner, 2011), but it has not yet been reported if app users actually read those religious texts in those intended and designed ways. Hutchings (2017) summarized the need for future research:

> As Bible software becomes an increasingly important part of everyday Christian religiosity and congregational practice, much further work will be needed to explore how users adopt or resist these digital texts, what impact their designs really have on user behaviour and perception, and how digital innovation will re-shape the established networks and relationships of Christian power. (p. 217)

Elsewhere, Hutchings (2014) has outlined and reiterated areas that need further investigation, namely: the processes through which Bible apps are designed and produced, the structure and content of the app, and how the app is used.

Broader Context of Digital vs Print Sacred Text

A discussion of digital sacred text reading may be better contextualized and situated in a larger conversation regarding the differences between reading in print and

reading on digital screens more generally. That discussion could take on added clarity, focus, and nuance as it is compared to research conducted on understanding reading sacred text in traditional print-based ways. This section aims to elucidate several key empirical findings relevant to a study of digital sacred text by situating it in a broader field of research as shown in Figure 2-2. Findings from literature in two areas will be described: digital vs print, and reading sacred text in print.

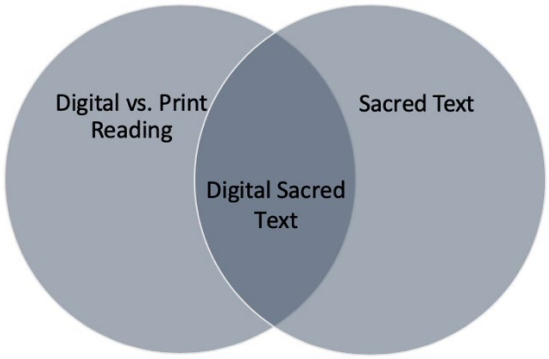

Figure 2-2. Overlapping Areas of Digital Sacred Text Research. This figure demonstrates overlapping areas of research that converge when investigating digital sacred text.

Digital Compared to Traditional Print Reading

There has been a recent surge in research regarding the implications of digitally based screen reading (Delgado et al., 2018; Mangen & van der Weel, 2016; Ross, Pechenkina, Aeschliman, & Chase, 2017; Singer & Alexander, 2017; Walsh, 2016). This surge is likely due to the relatively recent advent of screen-based digital reading technologies as compared to traditional print-based reading research. Moreover, there is

a demand to understand the effects of digital reading as the practice becomes more ubiquitous on a national and global level in education, politics, and personal reading (Giebelhausen, 2015; Hutchings, 2017; Shishkovskaya, Sokolova, & Chernaya, 2015; Singer & Alexander, 2017).

Although important work was conducted previously, Dillon's (1992) work serves as a noteworthy seminal review up to that date of comparative differences between digital reading and print reading. In his review, Dillon considered the research on factors such as speed of reading, accuracy, fatigue, comprehension, and preference. Dillon noted that, up to that point in time, paper reading was generally superior in terms of those factors. However, he also observed that underdeveloped technology such as screen quality and design features likely had a very substantial influence on results. Additionally, he criticized the methodological approaches and measurements of the research he reviewed by noting that outcome measures were much more frequent and less robust than process outcomes like eye movement, text manipulation, and navigation. He also lamented the shortcomings of single variable manipulation during inauthentic experiments. For example, speed or accuracy of short-text proofreading may not be the most salient variables to measure because more complicated and complex differences likely occur between print and digital mediums when reading in authentic settings. Specifically, Dillon observed that focusing on overcoming slower screen reading by addressing ergonomic issues such as aspect ratios or screen flicker might not really matter if someone is reading for entertainment and not concerned about speed. Further, manipulation facilities like scrolling, display size, text splitting, and input devices such as keyboards can influence screen-based reading experiences, but rapid changes in

technology, different text genres or lengths, and the goal of reading can vastly complicate and moderate the effects of those factors.

Dillon's (1992) review is often cited and serves as an important touchstone in the conversation surrounding digital reading. However, some scholars, including Singer and Alexander (2017), have reported shortcomings in that review because it was not systematic, did not consider the best extant evidence, slighted the operationalized definitions of reading or digital reading, and contained tenuous conclusions. Singer and Alexander specifically conducted their systematic review of the literature regarding digital reading starting from Dillon's 1992 review through 2017. Walsh (2016) observed that since 1992 there have been several advances in technology that make Dillon's review less relevant. Yet, Walsh recognized that Dillon sheds light on several problems with reading research that are still relevant today such as "the subjective nature of reading, the unique environmental circumstances of each study, the different outcomes measured across reading studies and the predominance of studies that focused on speed and accuracy for short texts as opposed to qualitative comprehension of multi-page, complex information" (Walsh, 2016, p. 167).

Comprehension. Comprehension tends to be the most frequently measured outcome when comparing digital and print text (Belmore, 1985; Cushman, 1986; Daniel & Woody, 2013; Muter & Maurutto, 1991; Singer & Alexander, 2017; Sullivan & Puntambekar, 2015; Sun, Shieh, & Huang, 2013; Young, 2014). However, the construct of comprehension can be difficult to measure because definitions and metrics can vary widely, and this variability can lead to complicated or inconsistent results. Dillon (1992) and Walsh (2016) cited studies that indicate a preference for paper when assessing

comprehension; however, Dillon and Walsh both noted several other studies demonstrating no difference in comprehension between digital and print reading. Further, Dillon and Walsh each commented on factors and variables that tend to moderate results when measuring for comprehension, such as participants' previous technology experience, age, prior knowledge of reading content, length of text, and complexity of text. Moreover, Dillon emphasized that comprehension has not been measured consistently, even though the studies he reviewed tended to use post-task content questions such as multiple-choice responses or open-ended questions of content knowledge. Importantly, Dillon and Walsh agreed that overall there does not seem to be any significant difference in comprehension between reading digitally and print. This conclusion is also supported by other scholars such as Ross et al. (2017) who argued that a false dichotomy between digital and print reading is not helpful. Singer and Alexander (2017) agreed that both digital and print mediums appear to have a place in literacy and learning, and little is gained by asserting a false dichotomy. Ross et al. further concluded that as young people continue to become more natively familiar with screen reading, disparities in learning outcomes between print and digital mediums will likely be minimized.

In contrast, other researchers have found important differences in comprehension between print and screen reading (Kong et al., 2018; Singer & Alexander, 2017; Wang, Jiao, Young, Brooks, & Olson, 2008). For example, Delgado, Vargas, Ackerman, and Salmerón (2018) conducted a meta-analysis of 54 studies in which comprehension was compared between print and digital reading. Their results yielded a "clear picture of screen inferiority" (p. 34), especially when a reading time limit is imposed. Contrary to

suggestions that differences in comprehension between digital and print reading should decrease over the years, Delgado et al. strikingly found as they analyzed studies between the years 2000 to 2017 the advantage of print over digital increased over that period of time. Their findings suggest that readers may actually be adopting a shallower processing style in digital environments over time (Lauterman & Ackerman, 2014; Wolf & Barzillai, 2009). As readers associate digital environments with quick reading of short messages such as e-mails or other communications, they may perpetuate shallow reading in other digital contexts. Liu (2005) documented this phenomenon by showing how deep reading practices decreased over the previous 10 years while shallow practices such as browsing and scanning increased with respect to digital reading. Others have also lamented that the societal trend towards screen reading may be decreasing our ability to read deeply (Cull, 2011; Durant & Horava, 2015; Levy, 1997). Neuroscientists and others have even reported an observed poor effect on the physiological functioning of the human brain because of digital reading (Carr, 2010; Wolf, 2010; Wolf & Barzillai, 2009).

Singer and Alexander's (2017) review casts further light on the complications of comprehension between digital and print reading. After systematically reviewing 36 studies, they determined that there is a paucity of either explicit or implicit definitions with respect to digital or print reading comprehension; and, they described a noticeable variability in measures and approaches to test participants' comprehension. One of the most helpful findings regarding comprehension from Singer and Alexander came as they juxtaposed text length with comprehension. A previously fuzzy picture of comprehension included reports that comprehension was better in print than in digital (Mangen, Walgermo, & Bronnick, 2013; Noyes, Garland, & Robbins, 2004), while others

report better comprehension when readers processed texts digitally rather than in print (Kerr & Symons, 2006; Verdi, Crooks, & White, 2014), and yet others reported no significant differences in reading comprehension for print or digital mediums (Akbar, Al-Hashemi, Taqi, & Sadeq, 2013; H. K. Lee, 2004; Rockinson- Szapkiw, Courduff, Carter, & Bennett, 2013; Young, 2014). However, when the text length was considered then a clear association emerged. When text lengths were short, studies reported no significant effect on comprehension between print and digital reading, or comprehension was better in the digital environment. Yet, when text length involved more than 500 words or took up more than one displayed screen then comprehension scores were significantly better for the printed environment over digital. Singer and Alexander regarded this interaction as an important finding that was evidenced in 92% of the studies analyzed in which text length was specified. Mangen, Walgermo, and Brønnick (2013) concluded that "the difference in comprehension performance between the print and the computer group could be related to issues of navigation within the document" (p. 65). They further noted previous research indicating an imposition of spatial instability that occurs from scrolling. In essence, scrolling breaks up spatial awareness of a text and can cause increased cognitive load (Durant & Horava, 2015; Payne & Reader, 2006; Proaps & Bliss, 2014; Stoop, Kreutzer, & Kircz, 2013; Wästlund, 2007). Both of these factors can cause a decrease in overall text comprehension.

Other import factors were also reported by Singer and Alexander (2017) regarding comparative differences between print and digital reading. For example, the grain size of comprehension questions seems to matter. When comprehension questions are aimed at overall large-scale global understanding of a text then there tends to be no

difference between print and digital. However, when questions are more detailed and specific then readers tend to perform better with print. One factor that can negate this finding is if specific information can be found using a quick digital search of the text. Singer and Alexander continued to report other factors that warrant further consideration, such as age of reader, intended purpose or depth of reading, prior topic knowledge, features of the digital device such as backlighting and device navigation, and other individual reader differences. They called for a better, more multi-faceted, emergent model of comprehension as it relates to digital reading practices.

Mangen and van der Weel (2016) have also called for an integrative transdisciplinary framework or model in order to facilitate a better understanding of reading in general and digital reading specifically. This framework should synthesize previous research and guide future research as it defines reading along the following dimensions: ergonomic, attentional, cognitive, emotional, phenomenological, sociocultural, and cultural-evolutionary. Mangen and van der Weel contend that this framework could clarify understanding and enable fine-tuned measures of a number of potentially mediating variables with respect to reading outcomes. In Mangen and van der Weel's model, mediating variables would include: substrate (paper vs digital interfaces), interface characteristics, text (length, type, complexity), level of comprehension (surface to deep), time of recall (short-term or long-term), readers (age, sociocultural background, gender, expertise level with content and technology), and motivation or purpose for reading. They recognize the need for this multi-faceted model of reading because of the exponentially increasing presence of digital reading with a myriad of dynamic features and a generally poor understanding of the current changes in digital reading behaviors.

They further recognized that "empirical studies exist (notably, in cognitive and educational psychology and cognitive neuroscience), but differences in textual material, instruments, measures, and in definition of key constructs make it difficult to compare and synthesise findings" (p. 118). Walsh (2016) agreed that "such variables as participants' existing technology expertise, their age, prior knowledge of the subject tested and length of the test documents make it difficult to compare comprehension results across various studies" (p. 169). Indeed, there seems to be important differences between digital and print reading comprehension, but further research is needed to understand the relationships between multiple influencing variables.

Nonlinear Hypertext and Other Factors. The following section highlights other important differences between digital and print environments that have emerged from current research. These factors include the role of hypertext and non-linear reading associated with digital reading, navigational considerations, the emphasis on college students' reading of academic text and their preference and perceptions of print, and eyestrain or fatigue.

One of the challenges with defining digital reading is that it does not always align with traditional print reading in a number of potentially important ways. For example, digital text is often associated with hypertext that can be read in non-linear ways (Shapiro & Niederhauser, 2004). Hypertext, like most traditional Internet pages, has embedded links that a reader can choose to follow to other reference points, related information, other text, or multimodal elements such as graphics or videos (Lawless & Kulikowich, 1998; Reinking, 1997; Sandberg, 2013). This non-linear approach has been shown to activate or engage a motivated learner with high levels of content knowledge and

technological familiarity, or it can stifle, overwhelm, and confuse others especially if the text genre does not naturally lend itself to non-linear reading (Alexander & Kulikowich, 1994; Burin, Barreyro, Saux, & Irrazábal, 2015; McDonald & Stevenson, 1998; Reushle, 1995; Sandberg, 2013; Shapiro & Niederhauser, 2004; Walsh, 2016; Zumbach, 2006).

One of the most frequent problems reported with navigating hypertext is a phenomenon known as "lost in hyperspace" (McDonald & Stevenson, 1996; Shapiro & Niederhauser, 2004; Zumbach, 2006). This occurs when the reader becomes disoriented or lost in the text because not only does the text content require comprehension skills, but navigation through the text requires metacognitive selection of links, goal-directed decisions, and decisions regarding coherence and integration of content. Furthermore, several studies have reported the importance of readers needing to get a sense of their physical location within an overall body of text (Mangen, 2016; Mangen & van der Weel, 2016; Shapiro & Niederhauser, 2004). When readers pick up a paper book and flip to a certain page, they not only can see the spatial location of a sentence on a page, but they can also easily tell how far they are in the overall location of the book. This spatial awareness is strikingly important for comprehension and recall (Delgado et al., 2018; Fastrez, 2001). Digital interfaces should be designed in ways that spatial navigation and recollection can naturally and easily mirror traditional print. The instinctive benefits of tangible spatial awareness likely influence the frequently reported preference that readers have for print over digital text particularly when reading or annotating complex text (Buzzetto-More, Sweet-Guy, & Elobaid, 2007; Delgado et al., 2018; Rose, 2011; Sandberg, 2011; Spencer, 2006; Stoop et al., 2013; Walsh, 2016). Furthermore, the bulk of research conducted on hypertext and digital reading has been conducted with college

students and their reading of academic or expository texts (Burin et al., 2015; Buzzetto-More et al., 2007; McDonald & Stevenson, 1998; Puntambekar & Goldstein, 2007; Sandberg, 2013; Singer & Alexander, 2017; Walsh, 2016; Wenger & Payne, 1996; Zumbach, 2006; Zumbach & Mohraz, 2008). Thus, an important research gap may be the critical role that age and prior knowledge with content and technology may play (Burin et al., 2015; Mangen & van der Weel, 2016; McDonald & Stevenson, 1998; Singer & Alexander, 2017; Walsh, 2016; Zumbach, 2006).

Another variable that may affect a preference for printed over digital text is eye strain and fatigue observed from screen reading (Jabr, 2013; Köpper, Mayr, & Buchner, 2016; Lin, Wang, & Kang, 2015; Siegenthaler, Bochud, Bergamin, & Wurtz, 2012). Improved technology with sharper displays and softened or adaptive backlighting has improved this complaint tremendously, and digital devices that are not backlit have proven beneficial (Siegenthaler et al., 2012). However, there may still be a contribution to eye strain simply from the different positions that digital devices are held in relation to the eyes as compared to books or printed material (Köpper et al., 2016).

Considering the nearly universal presence of digital reading and the current status of research on digitally-based reading with its multitudinous variables, it makes sense that researchers have called for "more attention to how readers actually engage different media, their reason for choosing one format over another, and the satisfactions with each format" (Liu, 2005, p. 702). Furthermore, there is an "urgent need to investigate" the effects of digitization on reading different kinds of texts for different purposes (Mangen & van der Weel, 2016). Studying digital religious text reading could contribute and respond to the broader field of digital reading by providing an under-investigated text

genre that is not likely read in the same way or with the same purposes as academic expository textbooks.

Reading Sacred Text in Print

While there is a more rigorous body of research regarding digital reading, there is still very little empirically known about reading sacred text in traditional print. This is somewhat surprising considering how pervasive religious text and literacy practices are across the United States and throughout the world (Manseau & Sharlet, 2004; Prothero, 2007). We know that in the United States, for example, 85% of adolescents self-identify with a religious group (Smith & Denton, 2005) and that more than one-third of the total population specifically identifies as Evangelical Christian (Juzwik, 2014; Lindsay, 2007). However, we know very little about how these people read or engage with the sacred text that they claim to value so much. Rackley (2016) has called for the field of literacy to develop a body of research about the motivations and practices that drive people "to engage with the religious texts that mean so much to them" (p. 2). While focusing specifically on adolescents, Rackley (2018) has further beckoned, "notwithstanding the extant literature's recognition of the importance of Scripture in youths' lives, there is a surprising paucity of research aimed at identifying the specific practices youths use to read it" (p. 40).

Nevertheless, from Rackley and other researchers we have learned there are people who muster motivation to overcome textual barriers and "engage with complex texts as part of their everyday religious cultural practices (Rackley & Kwok, 2016, p. 55). Religious text often presents several obstacles to modern readers including archaic language with unfamiliar diction and syntax, complex literary devices, and apparent

internal contradictions (Rackley & Kwok, 2016). Despite these barriers, Rackley has empirically demonstrated that Methodists and Latter-day Saints persist through complex sacred text because they desire to gain further knowledge about their religion, apply teachings or principles to their lives, find strength to endure, receive comfort, and connect with God (Rackley, 2016). Much of Rackley's published results came from interviews and observations over the course of two years with 16 adolescents from a U.S. Midwestern university community. Findings from Rackley are similar to Ronald (2012) who described how "95 diverse participants from Boston and Atlanta" read sacred text utilizing the following models or motivations: devotional/therapeutic (feel strengthened, comforted, and connected to God), educational (learn about religion and new ideas), and appropriation (how to live and apply teachings). Participants in this group identified as Mainline Protestants, Conservative Protestants, African American Protestants, Catholics, Jews, Latter-day Saints, nontraditional, and nonreligious/nonspiritual.

Rackley (2018) has also preliminarily identified practices or strategies that Methodist adolescents use to make sense of their scripture reading experience: drawing inferences, making comments, making connections, recognizing confusion, and using prior knowledge. Using Rosenblatt's (2013) transactional theory to describe how readers construct meaning from sacred text, Rackley (2017) has further shown that Methodists use interpretive questions, visualizations, summaries, comparisons, and real-life applications. These strategies are similar to Latter-day Saints who have been found to summarize, comment, connect, infer, and problem solve (Rackley, 2015). Even though Latter-day Saints and Methodists have differing religious discourses (Gee, 1999, 2008) for interpreting value or meaning from scripture (Rackley, 2014), their shared

motivations for reading religious texts and similar practices may transcend denominational differences (Rackley, 2016).

Future research could build on these findings by validating, nuancing, or challenging them in a digital e-reading context and with other ages or demographic groups. As Rackley (2014) has observed:

> Literacy, from a social practice perspective, is seen as a mediating device for making sense of one's environment and experiences at particular times, in particular places, and for particular purposes (Scribner & Cole, 1981; Street, 1984, 1995). Individuals, then, do not simply read. They read particular types of texts (e.g., the Bible), at particular times (e.g., early in the morning, after a tragic event), in particular ways (e.g., aloud) and places (e.g., church), and for particular purposes (e.g., to find answers to important questions). (p. 418)

Questions remain to be answered such as how or in what ways digital contexts either change or reify the practices, motivations, experience, or outcomes of reading sacred text across different denominations and demographics. Moreover, questions persist about the intentionally formed affordances and limitations of digital sacred texts, how readers engage with those digitally designed texts, and what the design and use of digital scripture may reveal about scripture reading practices and values for particular religious groups.

Summary

In summary, the practice of reading sacred text, such as the Bible, with digital devices and mobile apps is growing at an accelerating rate. Even though there is a long stabilizing history connecting technological developments and religious practice, some commentators are concerned that digital scripture has the potential to vastly reconfigure structures of authority in society. This concern stems from acknowledgment of the

powerful effect that sacred text and its socially moderated interpretation can have on the worldviews and behaviors of individuals and communities across the planet. However, religious communities do not all approach sacred text in the same ways. Previous research has found that some religious communities and values are not being dismantled as much as they are simply finding a new mode of expression and communication through a digitally connected context (Hutchings, 2017).

Utilizing mostly qualitative methodology with self-reported data collection, previous scholarship on digital sacred text has focused largely on the design of mobile apps and the perceptions of app users. However, no one has simultaneously considered design intentions and how users actually interact with a sacred text app within a specific religious group. Previous work has outlined several possible methods for gathering and analyzing potentially meaningful data including collection of user-generated data from companies or stakeholders that produce religious apps. Furthermore, previous work has preliminarily found that, although religious readers honor the physical form of text, there are several perceived advantages as well as disadvantages to reading scripture on digital devices such as mobile phones. Advantages center mostly on the ideas of convenience, constant connection, and accessibility including searchability. Disadvantages of digitally reading sacred text include distraction, more shallow reading, and less familiarity with overall text structure.

Research on digital sacred text can both be informed by and contribute to extant literature on general e-reading as well as the sparse studies of traditional print scripture literacy. Studies of digital reading have found important differences between reading in print and reading on screens, including a general preference for print with difficult texts

(Buzzetto-More, Sweet-Guy, & Elobaid, 2007; Rose, 2011; Sandberg, 2011; Spencer, 2006; Stoop et al., 2013; Walsh, 2016). Comprehension, though inconsistently measured, tends to be the same whether reading in print or on screen as long as the screen is naturally easy to read and the text is short or simple (Singer & Alexander, 2017). However, when text is complex, lengthy, or when readers are unfamiliar with the content or the technology, then the reading practices associated with screens create significant barriers to readers, and comprehension decreases (Mangen et al., 2013). Researchers in this field have called for more studies that attend to how readers actually engage different media with different kinds of text that are read with different purposes or motivations (Liu, 2005; Mangen & van der Weel, 2016; Ross et al., 2017; Singer & Alexander, 2017).

Scant research on religious text has found that religious text is not read exclusively for increased knowledge acquisition (Rackley, 2016, 2017). Instead, readers approach sacred text with devotional intentions to feel connected with God and community, find comfort and strength, and apply teachings (Gorichanaz, 2016; Malley, 2004; Ronald, 2012). In order to overcome the complex nature of sacred text and find meaning, some readers employ practices such as visualization, question asking, summarization, commenting, or connecting (Rackley, 2017, 2018). However, it remains to be seen whether these practices or strategies are similarly employed while reading sacred text with digital devices or screens. Additionally, it is not known whether religious app designers intend for their sacred text apps to facilitate these reading strategies. Furthermore, all previous work with digital sacred text users has relied on self-reported data collection. Therefore, more direct measures or assessments are needed.

CHAPTER III

METHODS AND PROCEDURES

The purpose of this study was to investigate the design and use of a digital sacred text app within a religious community or group. As described in Chapter II, previous research on digital sacred text has focused on either the design or use of mobile apps. However, no study was located that simultaneously considered both the design and the use of a religious sacred text app within the context of a specific religious group. Furthermore, studies about users of digital sacred text have relied on self-reported data from users, with one exception. Bellar (2017) concurrently analyzed the design and use of prayer apps while gathering data that did not rely exclusively on users' self-reporting. Bellar's work establishes a framework upon which future research can build including this current study.

Bellar's (2017) dissertation on religious prayer apps represents perhaps the only current example of an important research intersection that can occur from simultaneously considering religious app design intentions and use. Bellar utilized mobile application store descriptions of prayer apps and analysis of app screenshots or walkthroughs to infer designers' intended use of their products. For Bellar's study, a third-party user testing company provided brief screen and audio recordings of Catholic and Muslim users interacting with selected prayer apps.

Bellar's (2017) work provides at least two critical initial contributions: it investigated both the design and use of religious apps and it introduced data that do not rely primarily on users' self-reporting. However, Bellar's work could be strengthened and extended in at least four important ways. First, although product design analysis is

helpful, interviews with actual design teams could provide clarity regarding their motivations and intentions. Second, user testing with screen recording provides a more objective data source than users' self-reporting; however, it is limited by imposing an inauthentic setting with synthetic time constraints and testing objectives or tasks. These limitations could be addressed by relying on data collected by design organizations from their users' during normal operating practices. Third, Bellar focused on religious prayer apps, and she calls for others to build on her work by looking at religious sacred text apps in similar ways. Lastly, Bellar calls for similar research to be conducted with different populations and religious communities.

Therefore, this study adapts Bellar's (2017) approach to simultaneously analyze the design and use of a specific religious text app. Gospel Library is an app designed and used by members of The Church of Jesus Christ of Latter-day Saints for reading sacred text and other religiously significant content; therefore, it provides an opportune app for analysis. Moreover, because of the student researcher's religious affiliation within this group, utilizing the Gospel Library app can provide greater access to richer, more nuanced data and offer "understanding of what it means to do the things the group does" with deeper appreciation (Hutchings, 2015b, p. 102). Focusing on one specific app within a religious community is similar to other ethnographic approaches that allow a researcher with an insider perspective to act as a participant-observer in gathering and analyzing meaningful data (Duke & Mallette, 2011; Hutchings, 2015b). Furthermore, analysis of the Gospel Library app may also provide a more critical perspective on literacy-based affordances and less on corporate agendas because it does not rely on marketing and reviews in the same ways as corporately developed apps.

Research Questions

This study of the designed and used affordances of the Gospel Library religious text app seeks to address and answer the following research questions:

1. What affordances and limitations have mobile application (app) designers incorporated in the digital sacred text app, Gospel Library?
2. How, or in what ways, has a selected sample of Gospel Library app users utilized the designed affordances and limitations of the app?

To concretely conceptualize a group's reading behaviors or values among Gospel Library app designers and users, data from Research Question #1 and #2 are interpreted through a lens of Gibson Affordance Theory (1979) described by Costall (1995) and outlined below.

Research Design

Ethnography is a methodological approach that views literacy as a cultural practice and seeks to describe, explain, interpret, and provide insight into human behavior and cultural groups in naturally occurring sociocultural contexts and settings (Greenhow, 2011; Purcell-Gates, 2011). Further, ethnographic approaches are grounded in theories as they seek to identify patterns and themes in social behaviors, beliefs, and values—particularly when little is known (Creswell & Poth, 2018; Harris, 1968). Ethnography is useful for answering research questions like, "What is the culture of this group? What is happening, why, how, what does it look like?" (Greenhow, 2011, p. 74). Furthermore, ethnographies draw from multiple data sources including qualitative and quantitative, while using the concept of culture as a lens through which to interpret results (LeCompte

& Schensul, 1999; Purcell-Gates, 2011). Therefore, ethnography is a fitting approach for investigating the design and use of a sacred text app in a particular religious community.

This study is designed as a virtual ethnography as described by Greenhow (2011). According to Greenhow, virtual ethnography focuses on the convergence of cultural studies and science, technology, and information. This approach recognizes and seeks to make sense of the rapid and dynamic shifts in practice and culture that have come with the Internet and a digital revolution. Virtual ethnography relies on both qualitative and quantitative data to describe and interpret behavior and cultural values (Greenhow, 2011). Specifically, combinations of qualitative procedures can be used such as interviews, observations, focus groups, or document analysis. Further, procedures that gather numerical data may include measuring digital-reading comprehension, screen moves, eye-tracking, or Internet/app usage statistics. Following a virtual ethnography design, this study uses both qualitative approaches and quantitative user analytic behavior statistics to describe and interpret the design and use of the Gospel Library app by Latter-day Saints.

The specific methodology of this study follows the "the walkthrough method: an approach to the study of apps" outlined by Light, Burgess, and Duguay (2018, p. 881). This method is "grounded in a combination of science and technology studies with cultural studies, through which researchers can perform a critical analysis of a given app" (Light et al., 2018, p. 881). To conduct the walkthrough method, affordances or features are examined by gathering data that demonstrate the app's environment of expected use and then gathering data through a technical walkthrough. The app's environment of expected use is shown by analyzing design "conceptions the app conveys about activities

it is supposed to provide, support, or enable" (p. 889). This examination includes collecting data from app stores and the description text of an app provided through an app store, and it may also utilize company blogs, marketing materials, or other public statements. A technical walkthrough is then conducted in which a researcher engages with the app and documents affordances in the "user interface arrangement, functions and features, textual content and tone, and symbolic representations" (Light et al., 2018, p. 891). Affordances are documented during app registration and entry, everyday use, and app closure or leaving. This method has limitations because it does not directly collect and analyze designers' intentional motivations or attitudes, and it does not collect and analyze actual user activity. However, Light et al. advise that limitations of the walkthrough method can be addressed by combining methods or data sources. For example, they suggest interviewing developers to clarify their intentions. Furthermore, they encourage data collection from actual user activity. Therefore, this study follows the walkthrough method outlined by Light et al. and utilizes design team interviews and user analytic data to offset suggested limitations.

In particular, this study addressed the research questions by gathering and describing qualitative data on the designed affordances of Gospel Library through multiple sources; namely, app store description textual analysis, technical walkthrough, and design team interviews. Quantitative user-analytic data were gathered from the app-owning organization; then, statistically analyzed and described to better understand the use of Gospel Library affordances. This ethnographic approach then looked for patterns and themes in design and usage affordance data to better understand how Latter-day Saints value and read an app-specific digital scripture.

Following ethnographic procedures, this study was strengthened in validity, reliability, and credibility through triangulation with multiple data sources of converging evidence, member checking by having key informants review information, and ensuring sufficient time for data collection (Barone, 2011; Creswell & Poth, 2018; Purcell-Gates, 2011; Yin, 2009). Multiple data sources can include combinations of observations, textual analysis, interviews, surveys, content analysis, and the collection of artifacts, documents, or archival data (Yin, 2009). Member checking refers to when "the researcher shares his or her evolving interpretations of the data with study participants to gain their perspective" and feedback to ensure accuracy of interpretation (Purcell-Gates, 2011, p. 148). Lastly, data need to be gathered for a justifiably sufficient amount of time to demonstrate that findings are based on normal or baseline behavior and not simply an aberration (Barone, 2011; Creswell & Poth, 2018).

As described in detail below, triangulation in this study was achieved by collecting design data from multiple sources: textual analysis, app walkthrough, and interviews. Member checking of findings from interviews and cultural interpretations occurred by providing interviewees and key informants a copy of analyzed transcripts and results for any needed clarification or feedback. Furthermore, to better understand group values, this study benefited from comparing the design and use of Gospel Library with other major sacred text apps, some of which have been reported in previous studies (Hutchings, 2017; Siker, 2017). Comparing multiple apps gives cultural contrast to more clearly understand the primary focal app under investigation (Barone, 2011; Purcell-Gates, 2011). Finally, user analytic data on app usage were gathered as far back as

possible including the previous five years to strengthen reliability (Creswell & Poth, 2018).

Data Source, Collection, and Analysis

For this study, data on the design and use of Gospel Library were gathered in two areas: designed affordances (Research Question #1) and used affordances (Research Question #2) as demonstrated in the study timeline shown in Figure 3-1. Data from the two research questions were interpreted through a lens of Gibson Affordance Theory (1979) conceptualized from Costall (1995).

Designed Affordances: Research Question 1

To investigate designed affordances and increase reliability through triangulation, three phases of inquiry were used: 1) textual analysis of online app store descriptions, 2) walkthrough of selected app's functionality through screenshots, and 3) interviews with Gospel Library app design team.

Phase 1- App Store Descriptions

As outlined by Light et al. (2018), the first phase consisted of textual analyses using the brief descriptions of religious text apps provided by designers and owners through an online app store. Textual analysis consists of coding app store descriptions for themes, and providing evidence of app affordance usage that designers intend or prioritize (McKee, 2003). These app descriptions are composed of a few sentences or paragraphs and images, which are provided through an app store and intended to explain the purpose or functionality of an app to potential users as shown in Figure 3-2.

STUDY TIMELINE

Research Questions

1. What affordances and limitations have mobile application (app) designers incorporated in the digital sacred text app, Gospel Library?

Data Sources	Analysis	Timeline	Total Cumulative Time
a. App store descriptions	Textual analysis (McKee, 2003)	1 week	1 week
b. Walkthrough of Gospel Library	Technical Walkthrough (Light et al, 2018)	1 week	2 weeks
c. Interviews with design team	Thematic analysis (Braun & Clarke, 2006) Member-checking (Creswell & Poth, 2018)	2 weeks	4 weeks

2. How, or in what ways, has a selected sample of Gospel Library app users utilized the designed affordances and limitations of the app?

Data Sources	Analysis	Timeline	Total Cumulative Time
User analytic data provided by design organization from app usage during previous year	Descriptive statistical analysis (Cohen, 2003)	2 weeks	6 weeks

Data Interpretation

Data Sources	Analysis	Timeline	Total Cumulative Time
Data from previous phases of this study	Interpretive categorization (Costall, 1995)	2 weeks	8 weeks

Figure 3-1. Study Timeline and Data Sources on App Affordance Design and Use.

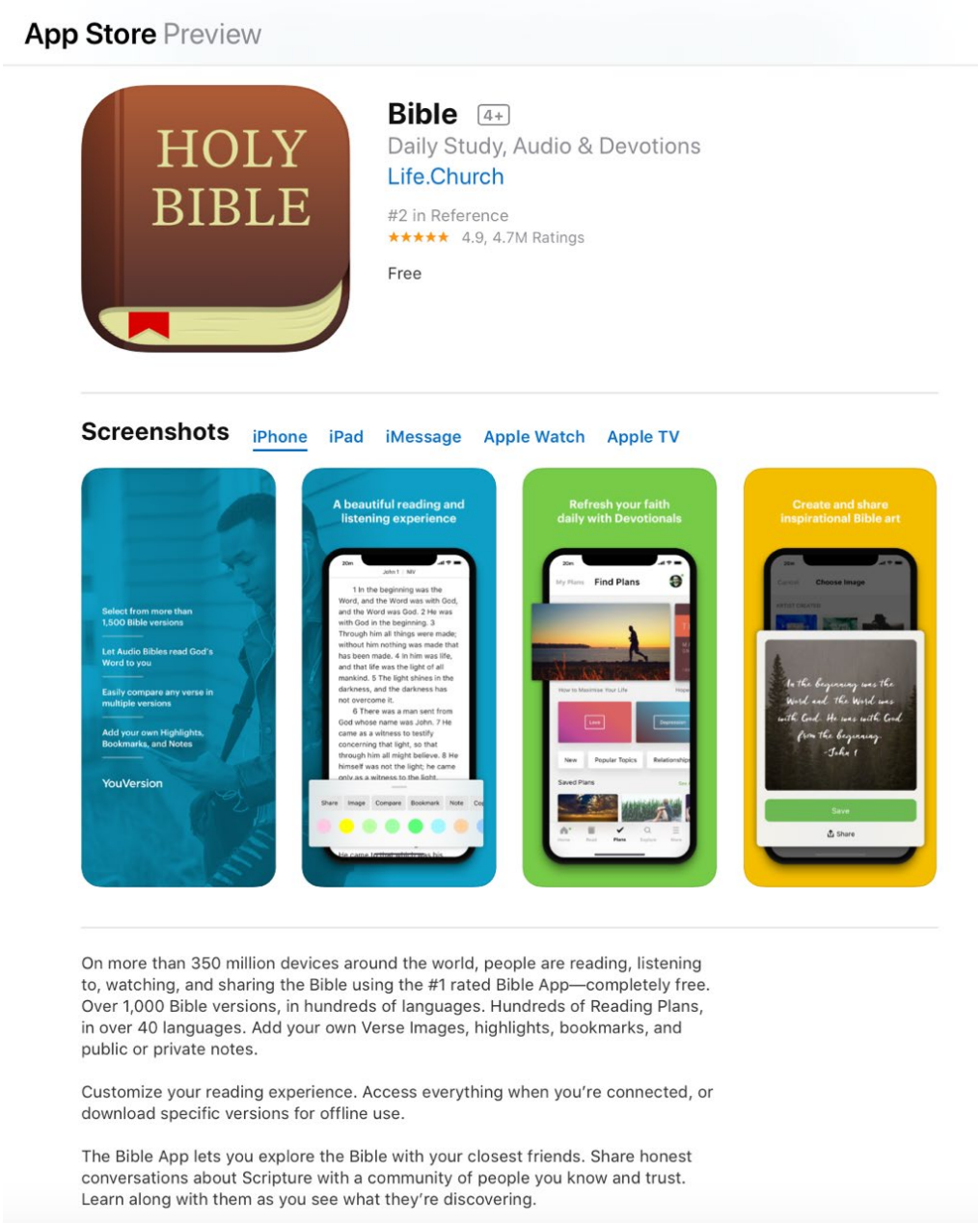

Figure 3-2. Example of App Description Text from iTunes App Store.

Bellar (2017) utilized textual analysis of app descriptions from iTunes, a major online app store to infer designers' intentional affordances. Therefore, this study used an approach similar to Bellar to identify some of the designed affordances of Gospel Library by analyzing relevant descriptions, coding for reported design affordances or features,

and comparing other sacred text app descriptions on iTunes. The app store, iTunes, was utilized for two reasons. First, most of the previous studies on religious app design have relied on iTunes, including Bellar, and thus provide a dependable example to follow and build (Campbell et al., 2014; Torma & Teusner, 2011; Tsuria, n.d.). Second, iTunes displays apps in categories such as "Reference" or "Book" apps and ranks apps within those categories. Therefore, iTunes was utilized to survey the top ranked apps in each category and identify religious text apps for inclusion and comparison of store descriptions. The iTunes store displays 240 of their top-ranked apps in each category; therefore, it was possible to identify and code the app store descriptions of any digital sacred text app that iTunes ranked under either the reference or book sections. Gospel Library was included as a top ranked app under the reference section; thus, its associated app store description was coded for instances of touted affordance. Any additional sacred text apps that were identified under either the reference or book sections were also coded as demonstrated in the example Figure 3-3.

Coding categories and definitions for affordances were derived from previous work (Bellar, 2017) and were expanded inductively through constant comparative analysis (Glaser, 1965) to create the list shown in Figure 3-3 with the associated definitions provided in Appendix A. For example, if the app store description stated that the religious text app allowed users to listen to the text then it was coded for "Audio Listening," if the app reported to allow user to access multiple versions of the Bible then it was coded for "Multiple Versions/Translations." The initial list and definitions of affordances was based on Bellar (2017); however, as features or affordances arose which were not previously described or categorized then a coding category was created. For

instance, several apps reported to allow users greater ease while reading at night with dark mode themes or night reading settings for screen brightness; therefore, a code category was created for "Night Reading." Coding checks were performed by having a second coder, a master's student researcher not associated with this study who was provided training through verbal explanation and coding practice. The initial goal for inter-rater reliability was 70% agreement (McAlister et al., 2017). The second coder independently coded all of the identified app store descriptions, then coding results were compared between the student researcher and second coder. Actual inter-rater reliability between coders reached 89% agreement.

Coded data were then used to demonstrate some of the affordances incorporated in Gospel Library as shown in the example coding sheet, Figure 3-3. Furthermore, by analyzing the frequency of affordances reported from other sacred text apps in iTunes, comparisons were made between Gospel Library and other major sacred text apps to show which features are present, limited, or not present in Gospel Library. Virtual ethnographic approaches suggest that patterns and themes should be identified that will illuminate social and cultural values held by Gospel Library designers (Greenhow, 2011).

	Gospel Library	Additional comparison app(s)		
AFFORDANCE			**Total Counts**	**Percentage of apps that include this affordance**
Audio Listening				
Multiple Versions/Translations				
Search Tools				
Bookmarking				
App Navigation Ease or Beauty				
Sharing				
Private Notes				
Highlights				
Customization				
Commentaries				
Convenience/Portability				
Authority/Official				
Notifications				
Reading Plans				
Deeper Study				
Night Reading				
Pictures or Maps				
Personal Tracking				
Lifestyle (prayers, food, meeting)				
Videos				
Music/Radio				
Performance Feedback				
Memorization Aids				
Community Dialogue				
Pronunciation Aids				
Content Creation				
Public Notes				
Location Based Services				
Community Tracking				

Figure 3-3. Example of Affordance Coding Sheet for App Description Text from iTunes App Store.

Phase 2- App Walkthrough

The second phase of inquiry, the technical walkthrough, took a more focused approach by conducting an "app walkthrough" (Light et al., 2018) of the Gospel Library app and comparing the design of other popular Bible apps like YouVersion and GloBible as reported in previous research (Hutchings, 2017). Light et al. explained that "the core of this method involves the step-by-step observation and documentation of an app's screens, features and flows of activity" (p. 882). Similar to Bellar (2017) the app menu options and features or design affordances (e.g., sharing, note taking, audio, etc.) of Gospel Library were explored and photographed, and research notes on design features documented. The step-by-step procedure for the technical walkthrough is based on Light et al. (2018) and was organized as shown in Figure 3-4. Four mediator characteristics were described (user interface arrangement, functions and features, textual content and tone, and symbolic representations) during three activities or tasks (app registration and entry, everyday use, and app closure or leaving). An app walkthrough can uncover affordances not reported in a store description and can show prominent affordances such as main home screens or centrally significant features (Light et al., 2018). To stay consistent throughout this study, a walkthrough procedure was followed only for the Gospel Library app on the iOS platform made available on the iTunes app store.

Technical Walkthrough (Light, Burgess, & Duguay, 2018)

		Tasks		
		Registration and entry (R)	Everyday use (E)	App suspension, closure, and leaving (L)
Mediator Characteristics	1. User interface arrangement (placement of buttons and menus)			
	2. Functions and features (groups of arrangements that mandate or enable an activity)			
	3. Textual content and tone (text embedded in user interfaces, such as the order of drop-down menu options or the categories available)			
	4. Symbolic representation (semiotic approach to examining the look and feel of the app and its likely connotations and cultural associations with respect to the imagined user and ideal scenarios of use)			

Figure 3-4. Example of Coding Sheet for the App Walkthrough Method.

Phase 3- Design Team Interviews

The final phase of inquiry required the support of the Gospel Library app design team and consisted of semi-structured interviews with key design team members (Fetterman, 2020). Semi-structured interviews are "a social interaction based on a conversation…where knowledge is constructed in the interaction between the interviewer and the interviewee" using a protocol or preselected conversation questions (Creswell &

Poth, 2018, p. 163). Interviews provide an opportunity for interviewees to tell their own perspectives in their own words, while giving a researcher access to and evidence of social values and practices (Leech, 2002; Purcell-Gates, 2011).

The student researcher for this study received permission by appropriate gatekeepers from The Church of Jesus Christ of Latter-day Saints to conduct interviews with Gospel Library design team members. The purpose of these interviews was to identify design decisions and priorities for the included and excluded features or affordances in Gospel Library. An interview protocol was developed to structure the interview process (Fetterman, 2020; Jacob & Furgerson, 2012; Leech, 2002). This protocol began by thanking the participant for their time, relating the purpose of the study, and asking for their consent and permission to use an audio recording device (Creswell & Poth, 2018). Interview questions began with "grand tour questions" (Spradley, 2016) to open up respondents, and ended with asking specifics about the respondent, their length of employment, and follow-up contact information for further questions and member checking (Jacob & Furgerson, 2012; Purcell-Gates, 2011). Interview protocol and questions are presented in Appendix B; these questions were expanded based on information from Phase I and Phase II of this study.

Two interviews were conducted, one with the app product manager and one with the user experience designer, during the early summer of 2020. Via an online conferencing technology (Zoom), an interview with the two key design team members (product manager and user experience designer) lasted about 45-60 minutes each and was audio recorded, transcribed by the student researcher, and coded using thematic analysis (Braun & Clarke, 2006). Thematic analysis is "a method for identifying, analysing, and

reporting patterns (themes) within data" (Braun & Clarke, 2006, p. 6). Coding was conducted by analyzing transcripts for themes and evidence of designers' strategies, motivations or goals, and design intentions and limitations (Hutchings, 2015b, 2017) as shown in Figure 3-5. Specifically, transcribed interview statements were initially assigned a code for evidence of intentional affordances, unintentional affordances, limited affordances, and unintentional limitations designed into Gospel Library, as well as statements that manifest or demonstrate design motivations or values. Patterns, themes, and frequencies of ideas within coded categories were also considered to allow for other emerging themes (Braun & Clarke, 2006). Emerging themes were identified, coded, and categorized. The final codes fell under two categories: design priorities and design limitations. Design priorities were further divided and coded by evidence for intentional affordances (IA), desired future affordances (DA), and guiding design values (V). Design limitations were further divided and coded for limited affordances (LA) and guiding design constraints (C).

Interview Transcript Coding					
Statements that manifest or demonstrate:	Design Priorities			Design Limitations	
	Intentional Affordances (IA)	Desired Future Affordances (DA)	Guiding Design Values (V)	Limited Affordances (LA)	Guiding Design Constraints (C)

Figure 3-5. Example of Coding Sheet for Interview Transcript Coding.

After interviews were transcribed, coded, and analyzed for main themes or ideas, member checking occurred by providing interviewees a copy of analyzed transcripts for any needed clarification or feedback (Fetterman, 2020; Purcell-Gates, 2011). Interviewees were given the transcript and results shown in Chapter IV and then asked to review the findings to see if they felt the results were accurate or if modification was needed. Both interviewees responded that they felt the analysis of their interviews captured and reflected their thoughts accurately and no additional clarification or modifications of findings were needed. For privacy, interviewees were distinguished by their job titles and not by their given names.

Used Affordances: Research Question 2

To analyze how, or in what ways, a selected sample of Gospel Library app users have utilized the designed affordances and limitations the app, user analytic data were gathered, assessed, and statistically described (Cohen, 2013). It is generally known that when users download and use an app, they agree to have limited data gathered about their use of a product. The student researcher of this study was granted permission to access user analytics data previously gathered by Gospel Library app owners during normal app operational practices. This user analytics system records how the product or app is being used by consumers. Specifically, raw data are collected by the app owners such as number of active users, length of app usage instances, number of clicks on app features, number of searches, or number of annotations. These raw data are then de-identified and aggregated into spreadsheets to display numerical data; software developed to visualize data through charts or graphs is then used to analyze user behaviors.

For this study, user analytic data relevant to affordance use and digital scripture reading behaviors were gathered from the larger body of data, described, then analyzed to look for themes or patterns. This process included accessing the Gospel Library user analytic system and downloading numerical data into a spreadsheet software program, Excel. Numerical data consisted of whole or rational numbers representing measured analytics including number of active users across time, total app sessions and length of sessions, total content views, number of annotations, video play counts, audio play counts, number of content shares, number of searches, study plans created, and number of link clicks. As much numerical data as possible were collected from what the Gospel Library team made available and is described in Chapter IV.

Data were gathered about the use of Gospel Library during the previous five years, 2015-2020, and were collected during the summer of 2020; therefore, data were collected up until June or July of 2020. The length of time was selected to increase reliability and validity of data collection and findings (Barone, 2011; Purcell-Gates, 2011). Moreover, the app design organization compiles monthly user data into yearly units which are available for the previous five years. However, some features and affordances have not been tracking for the entire past five years; therefore, data as far back as possible were collected for the usage of those features. In particular, the number of specific content area views within the app have only been recorded since January 2018, and number of content shares, searches, and study plans created have only been tracked since January 2019.

After gathering information about overall or general use such as number of total installs and frequency of overall use, the downloaded numerical data regarding

affordance use were compiled into a master spreadsheet. Numerical data were organized by type (such as number of annotations, number of views, etc.) and time (month and year). This compilation was then visually graphed and described as shown in Chapter IV.

The student researcher did not initially know what user analytic data would be available when accessed; therefore, it was anticipated that specific data gathering and description would be informed by previous phases of this study. However, for this phase, the following list of guiding questions was developed to direct the process. This list of questions does not represent any additional research questions for this study; instead, these questions represent a way of guiding and conceptualizing which data were gathered to answer Research Question #2: How, or in what ways, has a selected sample of Gospel Library app users utilized the designed affordances and limitations of the app?

a. What intentionally designed affordances are valued and monitored, measured, or tracked by the design organization?
b. What limitations or unintentional affordances are not valued and not monitored, measured, or tracked by the design organization?
c. Which identified affordances are used the most or most frequently by users and by what percentage of total users during the previous year? How have these frequencies and affordance usage trends changed over the past five years?
d. Which affordances tend to be used closely together? For example, what app use behavior occurs immediately before or after marking, annotating, or sharing? Does affordance usage such as alerts and reminders coincide with increased frequency or daily use of other affordances?

e. Are any of these affordance usage behaviors moderated by demographic information such as age, gender, location, or time and length of use or experience? (If de-identified data allow for these comparisons)

f. Are any of these affordance usage behaviors moderated by specific content areas or text genres within Gospel Library?

Recognizing the sensitive nature of analyzing and publishing data gathered on users by app owners, care was taken to consider the privacy and vulnerability of both users and the app-owning organization as described by Hutchings (2015b). For example, no data were gathered or reported that could identify individual users, and no data exposed use by vulnerable groups such as users in countries where Christian proselytizing activity is prohibited.

Data Interpretation

Lastly, data about the two research questions were considered and interpreted in context of Affordance Theory (Gibson, 1979). Creswell and Poth (2018) suggest that ethnographic research should follow three aspects: description, analysis, and interpretation of the culture-sharing group. Interpretation of the culture-sharing group in this study came through analyzing data from the previous phases and categorizing into groupings described below. This categorization was based on the strength and number of converging data sources, and it may manifest Latter-day Saint social values and scripture reading practices through intentionally designed affordances, intentional limitations, or unintentional limitations. For example, intentionally designed affordances can be seen manifested in each of the data sources: app store descriptions, walkthrough, and interviews. Affordance Theory (1979) suggests this overlap in data could demonstrate

affordance use that is valued by designers. Furthermore, if app users are utilizing that particular affordance with great frequency, then it may be argued that a social or cultural value of scripture reading practice has been manifested.

Moreover, comparisons between Gospel Library and other religious text apps can situate the design, use, and cultural implications of Gospel Library in a broader context (Creswell & Poth, 2018). During Phase I of this study, data were collected on other religious text apps featured on iTunes so that similarities and differences can be compared between Gospel Library and other major religious text apps, some of which are already described in previous research (Hutchings, 2017). Although not a main focus of this study, comparison to other religious text apps may provide cultural contrast with which to see or understand one's own biased views and cultural heritage (Rogoff, 2003). For example, if most major religious text apps feature a particular affordance such as bookmarking or customization abilities, but Gospel Library does not, it might be argued that Latter-day Saints or the designers may not value that particular practice or affordance.

Specifically, Costall (1995) outlined how socially constructed artifacts or tools are intended or restricted to be used in certain ways because certain ways of usage are valued in that community. Social tools like the Gospel Library app are shaped so that they *should* be used in certain ways; however, the app *could* be used in a number of unintended ways and there are ways that it *would* ideally be used if unlimited design resources were available to include every potentially desired feature. In other words, data on Gospel Library design and use may demonstrate scripture reading practices that are valued by Latter-day Saints because these data show how religious text is *meant* to be

read, how it *happens* to be read, and how it is constrained or controlled within the community (Costall, 1995). Therefore, data from the first two research questions were framed or categorized in terms of what the data reveal about how Latter-day Saints believe scripture *should* or is *meant* to be read, how it *happens* to actually be read, as well as how it *should not* be read, as shown in Figure 3-6.

What do data from previous phases of inquiry show about how Latter-day Saints view scripture:	**How many converging data sources demonstrate this scripture reading practice or value, which ones?**
Should (is meant to) be read?	
(Affordances with the strongest intentional design presence and overlap in data sources)	
Could (happens to) be read?	
(Affordances not strongly featured, unintentional, or only present in 1 or 2 data sources)	
Would most ideally be read?	
(Affordances unintentionally limited or not present in Gospel Library, but desired by designers and/or users as evidenced in interviews and feedback)	
Should *not* be read?	
(Affordances intentionally limited or not present in Gospel Library as evidenced in interviews and feedback)	

Figure 3-6. Example of Coding Sheet for Demonstrating Cultural Reading Practices.

Conclusion

This study was intended to respond to and build upon previous research by investigating the design and use of the sacred text app Gospel Library by Latter-day Saints. This investigation utilized a framework of affordances to describe intentional and

unintentional design features and their usage, along with implications of socially structured practices of scripture reading within a religious community. A virtual ethnography approach was used to identify, describe, analyze, and interpret patterns and themes in the collected data. Bellar's (2017) work using a walkthrough method (Light et al. 2018) was followed but extended in four important ways: interviews with design team members informed design intentions, authentic usage data were gathered from actual users, a sacred text app was analyzed as opposed to a prayer app, and an unexplored religious group constituted the sample.

Design data were gathered from textual analysis of app store descriptions (McKee, 2003), app walkthrough procedures (Light et al., 2018), and design team interviews (Braun & Clarke, 2006; Hutchings, 2015b; Purcell-Gates, 2011). Data on app usage were provided by the user analytics system of the app design organization and descriptively analyzed (Cohen, 2013). Analyses from these two areas, design and use, were categorized to reveal or demonstrate the affordances and limitations Latter-day Saints appear to value in terms of scripture reading practices. Specifically, intentionally and unintentionally designed affordances and limitations of Gospel Library, along with their actual use, are expected to inform ways in which Latter-day Saints believe digital religious text should be read and used as members within their religious community.

CHAPTER IV

RESULTS

This study investigated the design and use of a digital sacred text app, Gospel Library. To answer Research Question #1, design data were gathered from three areas: app store description text, a walkthrough procedure of the app, and interviews with design team members. For Research Question #2, usage data were gathered by gaining access to user analytic data provided by the app-owning organization. This section reports findings from the study procedures previously described in Chapter III.

Design- Research Question #1

What affordances and limitations have mobile application (app) designers incorporated in the digital sacred text app, Gospel Library?

App Store Descriptions

Following the procedures outlined in Chapter III, a total of 69 app store descriptions (specific apps shown in Table 4-1) were analyzed for instances of reported affordances or features. The results in this section demonstrate only affordances or features that are reported or advertised in app store descriptions, not necessarily all of the affordances that an app may contain. Of the 69 total analyzed app store descriptions, 43 were found from the Reference section of iTunes, and 26 from the Book section of iTunes. Most of the surveyed apps (33 in Reference and 24 in Book) offer access to the Christian Bible and Christian resources. The Reference section yielded 10 Muslim Qur'an apps and associated resources, and the Book section offered 2 Qur'an apps.

There were not any other religious groups, such as Jewish Bible apps, represented in the top apps in either the Reference or Books sections of iTunes.

Table 4-1

List of Analyzed Sacred Text App Descriptions

Apps from Reference Section of iTunes		
#Bible: Verse of the day	Blue Letter Bible	NIV Bible App +
30 Day Bible Study	Daily Bible Inspirations	NKJV Bible by Olive Tree
alQuran	Daily Bible Verse Inspirations	One Bible
Ayah- Quran App	Eqra'a Quran Reader	Our Daily Bread
Bible	ESV Bible	Quran Al Kareem
Bible .	Faithlife Study Bible	Quran Explorer
Bible +1	Glo Bible	Quran Majeed
Bible App by Olive Tree	Gospel Library	Quran Pro Muslim
Bible for Catholics	Holy Bible	Quran Tafsir
Bible from eBible	iQuran	The Bible Memory App
Bible Gateway	JW Library	The Study Bible
Bible Hub	Light Bible	Touch Bible
Bible in One Year	Logos Bible Study Tools	Verse-a-day
Bible Verses: Daily Devotional	Muslim Pro	Verses- Bible Memory
Bible.is		

Apps from Book Section of iTunes		
Amplified Bible with Audio	Holy Bible King James	NLT Bible
Bible for Women and Daily Study	Holy Bible Mobile	Read Scripture

Table 4-1 Continued

Bible KJV	Holy Quran with English	Tecarta Bible
Bible One Year	HolyBible KJV	The Book of Mormon
Bible- Catholic Study	Inspirational Bible Verse of the Day	The Holy Bible FREE
Bible- The Word of Promise	King James Bible with Audio	The Holy Quran
Catholic Bible	KJV Bible	The Scriptures
Daily Bible App	KJV Bible Offline	WORDsearch Bible
Daily Bible Study	NIV Bible	

The following, Table 4-2, displays the total count of reported affordances in all of the 69 app descriptions surveyed for this study, and a complete coding sheet of the data is provided in Appendix C. A total of 29 possible affordances were identified across the 69 apps. For comparison, a column is included in the table to show which affordances are specifically advertised in the iTunes app store description of Gospel Library which advertises 11 of the total 29 possible affordances. Table 4-2 has been sorted to show the most frequently total reported or advertised affordances in descending order; and for reference, definitions of each affordance are outlined in Appendix A.

Table 4-2

Frequency of Reported Affordances in 69 App Store Descriptions

Affordance	Included in description of Gospel Library	Total count	Percentage of total app descriptions
Audio Listening	yes	45	65%
Multiple Versions/Translations		44	64%
Search Tools	yes	43	62%
Bookmarking		42	61%
App Navigation Ease or Beauty		42	61%
Sharing Ability	yes	39	57%
Private Notes	yes	39	57%
Highlights	yes	34	49%
Customization		33	48%
Commentaries	yes	26	38%
Convenience/Portability		25	36%
Authority/Official Content	yes	24	35%
Notifications		23	33%
Reading Plans		22	32%
Deeper Study Features	yes	19	28%
Night Reading		18	26%
Pictures/Maps	yes	17	25%
Personal Tracking		12	17%
Lifestyle (prayers, food, meeting)		10	14%

Table 4-2 Continued

Affordance	Included in description of Gospel Library	Total count	Percentage of total app descriptions
Videos	yes	7	10%
Music/Radio	yes	6	9%
Performance Feedback		6	9%
Memorization Aids		5	7%
Community Dialogue		5	7%
Pronunciation Aids		3	4%
Content Creation		3	4%
Public Notes		3	4%
Location Based Services		2	3%
Community Tracking		2	3%

Some notable distinctions were found between reported Christian and Muslim app affordances. For example, even though annotating affordances such as highlighting were frequently reported in all of the surveyed app store descriptions (49%), no Muslim Qur'an apps were found that offer this affordance. If the Muslim apps are separated out of the data, 60% of all Christian Bible apps advertise offering highlighting or marking affordances. In addition, even though several Christian Bible apps claim to afford official content connected to authority figures such as authorized Catholic Bibles or apps connected to a specific church (28% of all Christian Bible apps), a much higher

proportion of Muslim apps claim to afford content connected to authority figures (67% of all Muslim Qur'an apps). Muslim apps also disproportionally advertise audio listening (92% of all Muslim apps) and lifestyle aid affordances such as helps for prayers including reminders and directional or compass information (33% of Muslim apps).

Other notable distinctions can be seen between specific apps such as Gospel Library and the larger data set. In particular, offering multiple translations or versions of the sacred text is one of the most frequently reported affordances across the data (64% of all apps); however, Gospel Library neither advertises nor actually offers multiple English translations of sacred text. Yet, Gospel Library does offer translations of several other languages such as Spanish or Portuguese, even though it is not prominently advertised. Lastly, some of the least reported affordances are also offered by the most popular apps. For example, the most popular sacred text app, Bible (YouVersion), offers the rare ability to have community discussions or social dialogues with performance tracking or feedback, as well as create user generated content, and share reading plans. A screenshot of Gospel Library's app store description is included for reference as Figure 4-1.

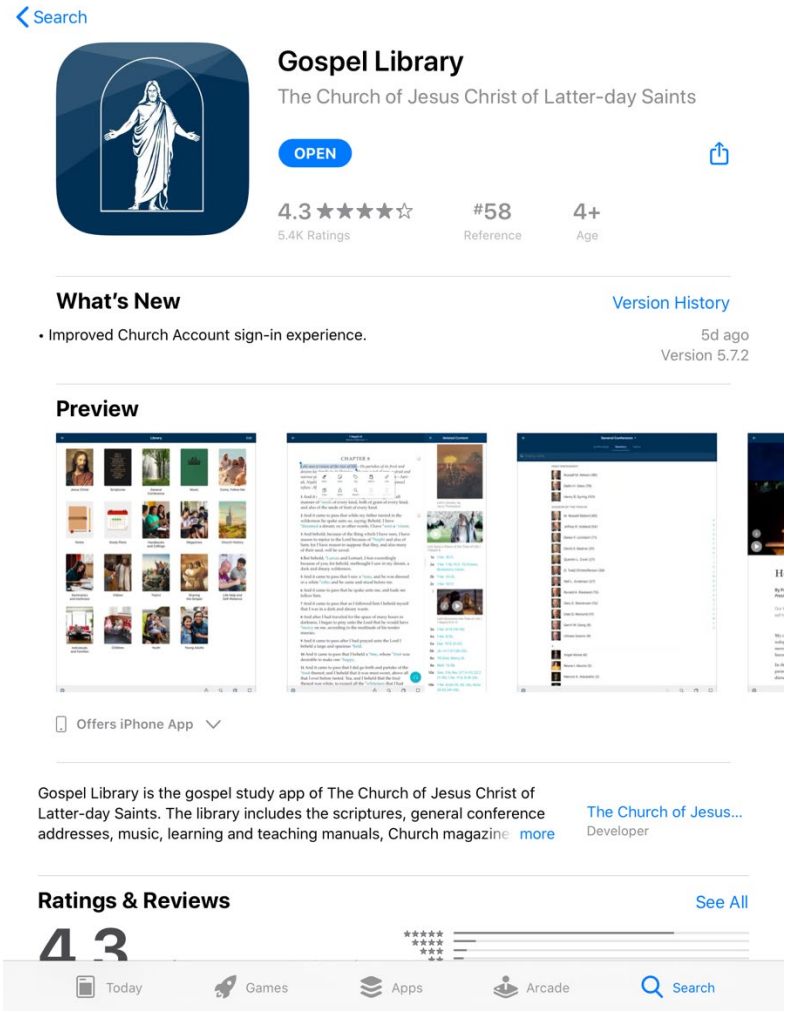

Figure 4-1. iTunes App Store Description of Gospel Library.

Walkthrough Procedure

A technical walkthrough procedure (Light et al., 2018) can show affordances that an app features prominently or those not explicitly advertised in an app store description. A walkthrough of Gospel Library produced the findings described in this section. Associated screenshots from every app menu and feature are included in Appendix D.

The technical walkthrough procedure produced findings across four mediator characteristics:

1. User interface arrangement (placement of buttons and menus),
2. Functions and features (groups of arrangements that mandate or enable an activity),
3. Textual content and tone (text embedded in user interfaces, such as the order of drop-down menu options or the categories available), and
4. Symbolic representations (semiotics including the look and feel of an app, its likely connotations and cultural associations with respect to the imagined user and ideal scenarios of use).

The user interface of Gospel Library is simple and straightforward. The app opens to a main home page screen laid out in a grid format displaying several different content categories with placeholders. Buttons and menus follow traditional platform design patterns by having a consistently available menu bar which can be hidden if desired. This menu bar includes settings and a few other features such as a shortcut button to searching, bookmarks, history, and screen switching. Gospel Library is laid out to indicate that its main function is a content shelf or library. The main user interface includes several layers of content categories that lead to several specific textual assets such as books, articles, manuals, and so forth. Once a user navigates through the content categories to a specific textual asset, then further menus and buttons are made available which afford interaction with the text. For example, once a segment of sacred text or any other text is highlighted it can then be marked, annotated, tagged, shared, linked, or searched. In addition, a side screen displaying related content can be accessed either by clicking a button or using a swiping action. Related content can include links to other Gospel Library content such as additional text, commentary, and audio-visual elements.

After choosing to view or skip new and updated content and features, the first interaction that a user encounters is creating an account, or sign-in. However, an account is not required and the sign-in prompt can be skipped or ignored. Users are again prompted to create an account when text is highlighted and an attempt is made to interact through annotation or marking; however, the prompt can again be ignored. Users are informed that an account is necessary to save or back-up annotations and other personalization even if the app is removed from a device. No further attempt is made to remind or retain users. If a user wishes to later create an account, sign-in, or view data privacy information then the user can access those in the settings of the app.

The order of content presented is statically set by the designers and only minimally adaptable or adjustable by users through obscure creation of a "custom collection" placeholder. The main home page contains a banner at the top of the screen that can take users immediately to scripture-based lesson material which is changed weekly. The first three categories of content presented to users are Jesus Christ, Scriptures, and General Conference. Buttons for these content areas are presented as placeholders with images representing some visual aspect of the specific content area. For example, the content area "Jesus Christ" is presented as a classical artistic image of Jesus Christ which is thus labeled. The content area "Scriptures" is presented as a labeled image depicting the front cover of a book of scripture. Additional content areas are similarly labeled with an associated image that represents the content area such as an artistic rendering, a photo, or a symbol that represents the area like hymns or a notebook. Photos capture diverse people in authentic and cheerful settings who are interacting with other people or with lesson material, scriptures, audiovisual elements, and other textual

content. Each content area placeholder button on the main home page of Gospel Library leads to further nested or embedded categories of content placeholders or buttons that have a similar look and feel throughout the app, each labeled with an associated image. Some images are shaded or faded indicating that a user must download that specific content to proceed further.

When a user arrives to the bottom layer of navigation, they are most often brought to a textual asset or screen filled with text and perhaps an associated image depending on the content area. Nearly all of the textual assets can be interacted with using the same consistent affordance menu which allows highlights, annotation, tagging, linking, sharing, and searching. Most of the textual assets in Gospel Library also have a sidebar showing related content that can be displayed or hidden. Text size and color can be adjusted in the settings of the app. In addition, most of the textual assets also have an audio recording of the text that can be played with adjustable speed.

Two last features or homepage placeholders are worth consideration: notes and study plans. The main home screen of Gospel Library has a placeholder with an image of a notebook that allows users to access all of their annotations. Further, a user can create a notebook or journal in which they can add pages and type their own text. Study plans allow a user to set a schedule for reading a user-selected content area in an adjustable amount of time. The user can then choose to allow the app to set a reminder and send a scheduled notification.

In summary, a walkthrough procedure of Gospel Library suggests the main function of the app is a content library which allows users to access an abundant amount of textual content including scripture. Preference seems to be given to certain content

areas such as scriptures, content about Jesus Christ, and General Conference sermons or messages. Users are allowed to highlight or annotate text but are not strongly encouraged or required to make an account to access any features accept to permanently retain annotations. There are many visual aspects of the app including images or pictures as content placeholders and other audio-visual elements such as scripture-based videos.

Interviews

While reporting the results of interviews, this section also synthesizes the results from previous phases to outline a comprehensive list of affordances and limitations incorporated into Gospel Library by the app designers. In addition to intentional affordances and limitations, interviews allowed for data to be manifested about the processes, values, and constraints that guide the design of Gospel Library. Although interviewees discussed some intentionally designed affordances, no new features were identified beyond those previously described in earlier phases of this study. Therefore, a comprehensive list of affordances incorporated into Gospel Library by designers includes the following 17 affordances out of a total possible 29 identified during this study:

- Audio Listening
- Search Tools
- Bookmarking
- Sharing Ability
- Private Notes
- Highlights
- Other annotations such as tagging and linking
- Customization

- Commentaries
- Authority/Official Content
- Notifications
- Reading Plans
- Deeper Study Features
- Night Reading
- Pictures/Maps
- Videos
- Music/Radio

As described in Chapter III, two separate interviews were conducted, one with the product manager and one with the user experience designer of Gospel Library. Interview statements from the two interviews were initially assigned a code when they displayed evidence of intentional affordances, unintentional affordances, limited affordances, and unintentional limitations designed into Gospel Library. However, as emerging patterns and themes were considered, interview statements relating to the design of Gospel Library fell under two categories: design priorities and design limitations. Design priorities were further divided and coded by evidence for intentional affordances, desired future affordances, and guiding design values. Design limitations were further divided and coded for limited affordances and guiding design constraints. For example, both interviewees made statements indicating that search functionality was intentionally designed into the app. Therefore, those corresponding statements were coded as "Intentional Affordances" (IA) under the "Design Priorities" category because they manifested that searching was an intentionally designed affordance. However, both

interviewees made additional comments indicating that in the future they would like to improve the search functionality of the app; therefore, those corresponding statements were coded as "Desired Future Affordances" (DA) under the "Design Priorities" category. Other interview statements manifested or demonstrated values that guided overall design priorities, as well as design limitations or constraints, and thus were accordingly coded as outlined in Figure 4-2. A complete table is provided in Appendix E of all relevant or germane statements coded from the interviews along with their preponderance. The following paragraphs detail unique results from the interviews about affordances and other limitations that designers have incorporated into Gospel Library. For organization purposes, the following section mirrors the structure of the coded interview data through first addressing design priorities and then design limitations.

Interview statements that manifest or demonstrate:					
	Design Priorities			**Design Limitations**	
	Intentional Affordances (IA)	Desired Future Affordances (DA)	Guiding Design Values (V)	Limited Affordances (LA)	Guiding Design Constraints (C)
Interview #1 (Product Manager)					
Interview #2 (User Experience Designer)					

Figure 4-2. Interview coding categories.

Interviews with both the product manager and user experience designer of Gospel Library demonstrated that certain affordances have been prioritized and intentionally

incorporated into the app. For example, interviewees indicated some affordances were not initially included in the first iteration of Gospel Library, but they have since been developed or intentionally expanded including "bookmarking, highlighting, notetaking, linking, sharing," music, audio listening, easier navigation, and study plans/schedulers. Some features were initially included in the design of the app and they have been expanded substantially such as the availability of commentary content including sermons or messages from leaders and manuals. One interviewee noted, "The tools have grown overtime and the content offerings have grown from just scriptures to also hymns, to also latest conference, also Come Follow Me [church-wide directed weekly scripture study plan], to also 3,000 other things." Recognizing the difference between increasing content/text availability and affordances, the same interviewee stated, "I divide the app into two things, it's a content app; and, it's got study tools." Therefore, intentionally incorporated affordances include both the content availability such as hymns and manuals, as well as study tools such as highlighting and annotations. The availability of annotatable content is seen as a way to "help users have revelatory experiences as they study," meaning that designers expect users to receive personalized direction about how to conduct their lives based on the material and study approach made possible by the app.

Other features have been intentionally incorporated into the design of Gospel Library; yet, designers expressed a desire to expand their presence and functionality such as search features and audio-visual content, noting, "improving the search is one of my top functions or features" for the near future. Furthermore, even though Gospel Library has a study plan feature, the design team more accurately described it as a "scheduler" that they wish to expand to allow for more topical or sharable study plans. Both

interviewees articulated several other potential future affordances and features they desire to design into Gospel Library such as audio playlists, adding images to annotations, verse of the day notifications, more personalization, and more social connectivity. Moreover, interviewees expressed a desire to incorporate affordances not currently available in Gospel Library but featured in other successful or popular sacred text apps such as performance tracking or feedback mechanisms, "streaks, badges, plans, I mean all kinds of stuff to entice and motivate and help people return and build daily habits."

Guiding values and priorities were described such as providing church content and materials, creating a meaningful study environment for users (specifically baptized members of The Church of Jesus Christ across the globe who have access to the technology), implementing sound design principles, responding to significant user feedback, and listening to the desires of church leaders. Yet too many inputs may make it difficult to balance priorities, "A lot of stakeholders ask for various things, a lot of general authorities [highest church leaders], including general officers, and the scriptures committee, like there's so many stakeholders. . . there's all kinds of inputs, there's no lack of inputs."

However, both interviewees expressed constraints that limit or direct which affordances have been prioritized and incorporated. These constraints include the absence of specific user feedback, lack of budget and time resources, and balancing design principles with other stakeholder interests as well as larger church-wide app strategies and communication channels. An interesting tension arose recognizing the team's desire to make more content and features available; yet, also expressing that ideally, "I'd delete a large portion of the content that's in the app." Meaning, the design

team seems to not yet be sure how much content is appropriate to curate on the app. Furthermore, there are design strategies that are still evolving, with one interviewee noting that the design team is debating, "strategically should Gospel Library be this one app that does everything, or should there be these separate apps that do things?" The product manager further noted,

> Decisions need to be made whether Gospel Library should be a one-stop app for all things or remain more focused as a reader app. … [The decision] will be made between myself with various staff and executive management across my department and then another church department that has digital channel strategy stewardship.

Some limitations were further explained such as the intentional absence of multiple English translations of the Bible in Gospel Library, study plans, or too many videos and too much content. For example, one interviewee explained, "It's a church position that we unify on the King James version of the English scriptures." Therefore, the intentional decision to exclude multiple Bible translations was expressed as a "church policy decision, not me not wanting to, or not getting to add it." Furthermore, designers recognize that users can respond to intentional limitations in Gospel Library by accessing other apps, namely, "YouVersion Holy Bible has every version they'd ever want, why do we have to provide all that."

Therefore, in summary, interviews with both the product manager and user experience designer did not identify any additional affordances incorporated into the digital sacred text app. The previous phases of this study identified 29 total possible affordances, and Gospel Library includes 17 of those. However, interviews shed light on specific design values and priorities as well as constraints and limitations. The Gospel Library design team expects users to access a wide array of religiously relevant material

in a digital environment that allows them to read as well as listen, highlight, take notes, and share content. Further, the design team wants to include features that assist users to receive relevant direction to their lives. Yet the design team is also balancing a desire to make more content and affordances available with budget resources, specific user feedback, universal design principles, and internal church leadership priorities or strategies.

Usage- Research Question #2

This section reports results to Research Question #2- How, or in what ways, has a selected sample of Gospel Library app users utilized the designed affordances and limitations of the app? User analytic data gathered from the Gospel Library app team provided insights into user behavior. Although several guiding questions were developed to direct the gathering of previously accrued data, not all guiding questions were able to be answered due to limited availability of data. This section represents the results from gathering and analyzing user analytic data provided by the Gospel Library team. After reporting general app usage behavior, this section describes how, or in what ways, Gospel Library affordances are measured and used. The following, Table 4-3, outlines Gospel Library affordances identified from Research Question #1 and notes how they are tracked or measured by the design team's user analytics system.

Table 4-3

Affordances of Gospel Library and User Analytic Tracking

Affordance	Measurement
Audio Listening	tracked as number of audio play counts
Search Tools	tracked as number of searches
Bookmarking	tracked as a subset of annotations
Sharing Ability	tracked as number of shares
Private Notes	tracked as a subset of annotations
Highlights	tracked as a subset of annotations
Tagging and Linking	tracked as a subset of annotations
Customization	not tracked
Commentaries	indirectly tracked by specific content area views
Authority/Official Content	not tracked
Notifications	not tracked
Reading Plans	indirectly tracked by study plans created
Deeper Study Features	tracked inferentially through annotations
Night Reading	not tracked
Pictures/Maps	indirectly tracked by specific content area views
Videos	tracked as number of video play counts
Music/Radio	indirectly tracked by specific content area views

General Usage

The following are other key metrics that are recorded and tracked as part of Gospel Library user analytic data: active users (defined as the number of unique devices which open the app at least once), hours spent per user per month, total sessions and length of sessions, users who annotate, and new annotations. Most of these metrics are also tracked by platform or device operating system, meaning Android or iOS. Depending on when the Gospel Library team started tracking any given metric, usage data were gathered from January 2015 or as far back as possible until June or July 2020. Data acquisition for this study occurred in July 2020.

The following, Table 4-4, displays some of the key metrics measured and tracked by the Gospel Library team. Annotations refer to any of the following features being used: marking, bookmarking, tagging, noting, or linking. Data for 2020 were averaged from January 2020 to July 2020. Metrics in Table 4-4 indicate that somewhere between 30–40% of active users annotate within the app, and active users have spent an average of 5.3 minutes per day in the app over the past five years.

Table 4-4

Key Metrics Measured by Gospel Library Team

Year	Average Active Users	Hours in App per User per Month	New Annotations per User per Month	Average Number of Users Who Annotate	Average Total Annotations per Month
2015	2,603,939	2.4	7.4	1,075,926	19,324,075
2016	2,995,598	2.5	7.7	1,268,662	23,200,425
2017	3,116,800	2.7	7.5	1,263,951	23,307,604
2018	3,163,274	2.8	9.0	1,077,086	28,550,571
2019	3,335,565	2.8	8.1	1,082,765	26,973,987
2020	3,297,192	2.8	7.6	988,350	24,963,764

Figure 4-3 displays active users measured every month since January 2015, separated between US/Canada and outside US/Canada, with a combined total. The positive trend line shows overall growth with notable peaks in the number of active users occurring every January. This trend of increased app usage in January manifests throughout other metrics such as number of app sessions. There is also a distinct downturn in active users and overall app usage since March of 2020. During personal conversations with the student researcher, the Gospel Library product manager expressed their understanding that the distinctly observable downturn in app usage starting in March 2020 is from COVID-19. Although it might be anticipated that app usage may have increased as more people were at home or quarantined, Gospel Library tends to be used more during regular Sunday worship services than any other time of the week (as suggested further below). However, beginning March of 2020, regular in-person worship

services were suspended worldwide for The Church of Jesus Christ of Latter-day Saints. Therefore, without weekly Sunday School meetings, the Gospel Library team recognized that their app's overall usage declined.

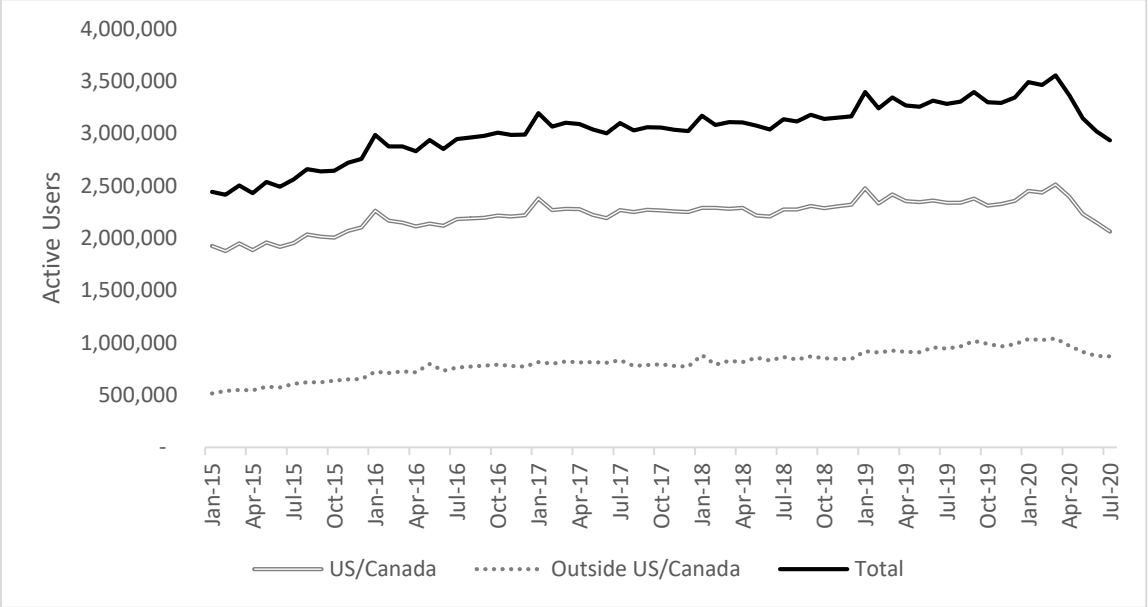

Figure 4-3. Active Users Inside and Outside US/Canada.

Figure 4-4 shows recorded app sessions every month from January 2015 to June 2020. Similar patterns of slightly increased numbers of app sessions in January occur, as well as a downturn since March 2020. Figure 4-4 further separates number of app sessions on Sundays compared to weekdays. There are typically more app session occurrences on Sunday than any other single day of the week; however, when taken compositely, there are more sessions throughout the week than on Sunday. Furthermore, increased overall usage is associated with weekday use as Sunday usage has stayed relatively static throughout the previous five years. For example, in January 2015, weekday app sessions account for 57% of total use and Sunday sessions account for 43%

(40,798,327 weekday sessions and 30,625,752 Sunday, for a total of 71,424,079 sessions). In January 2020, there were 105,612,430 total app sessions recorded—an overall increase of 34,188,351 or 48% more than the same date five years previously; however, weekday app sessions account for 67% of use (70,340,096 sessions) and Sunday accounts for only 33% (35,272,334 sessions).

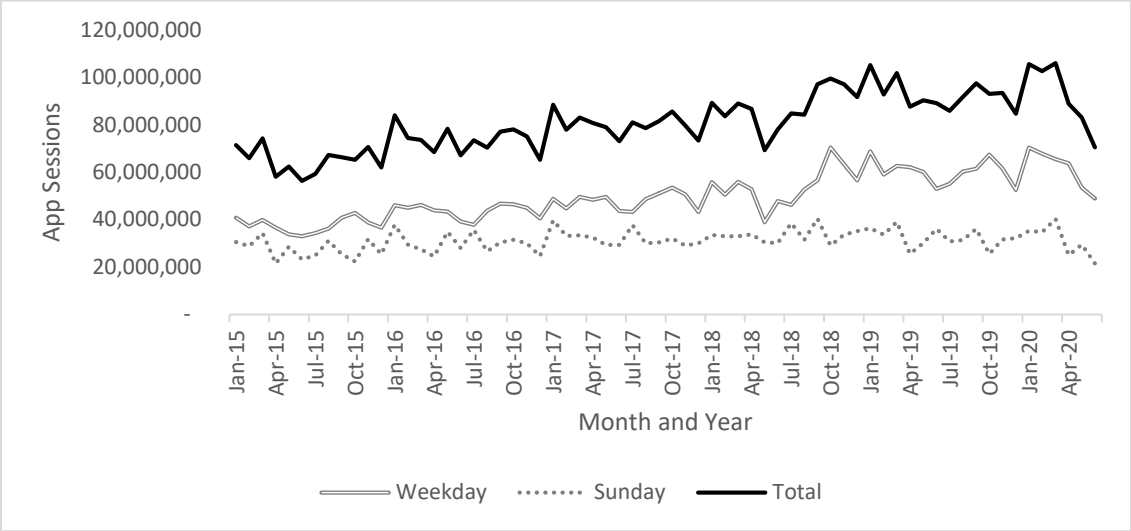

Figure 4-4. Number of Recorded App Sessions.

Figure 4-5 shows the length of individual app sessions recorded during the month of July 2020 using the bins or categories collected by the user analytics system. This snapshot of one month is reflective of the length of app sessions during the previous year. Most app sessions (14,620,924 out of 63,717,023) or 23% last 1–10 seconds. However, almost as many sessions (14,402,070 or about 23%) last 3–10 minutes. The first interval (1–10 seconds) may represent users accidently opening the app or only accessing it quickly to look up a brief notification or reference. The majority (55%) of sessions last somewhere between 1–30 minutes. Averaged across the 3.3 million active users,

63,717,023 total sessions can represent 19.31 app sessions per each active user during one month. Peak usage occurred in March 2020 with 105,911,624 total sessions representing an average of 32.09 app sessions per active user during that month.

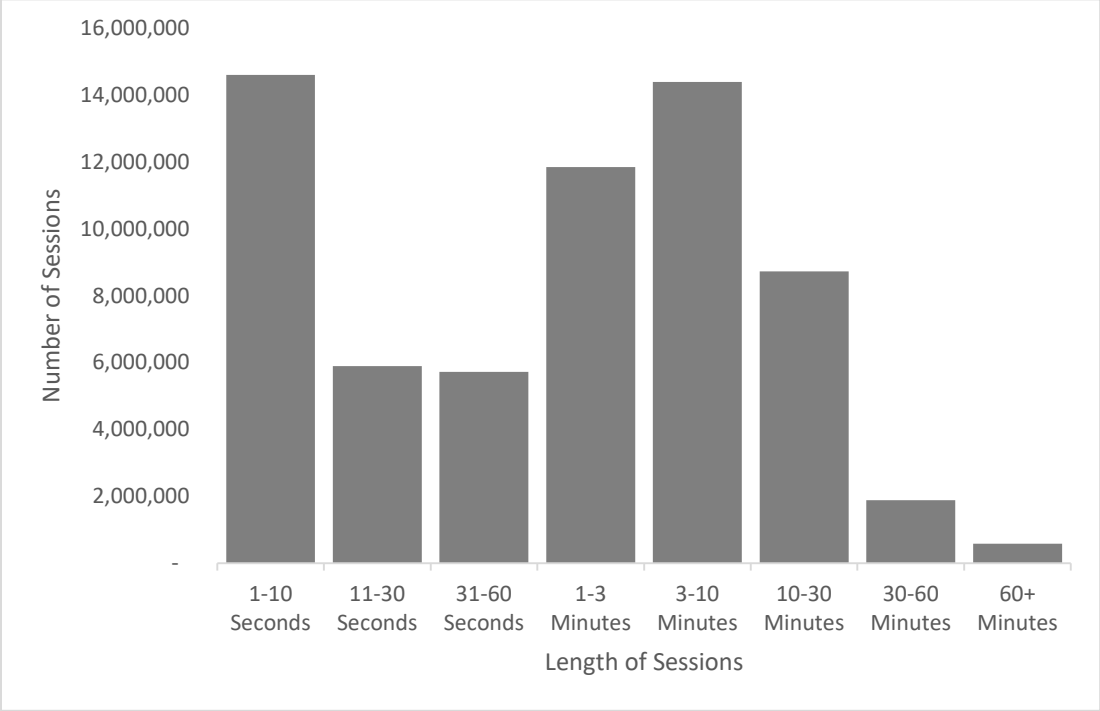

Figure 4-5. Length of App Sessions During July 2020

Content Area Views

Figure 4-6 and Figure 4-7 both show the number of content views across time. Content views are specific textual assets within Gospel Library such as the New Testament, Old Testament, Book of Mormon, or other books and manuals such as Hymns or magazines. Figure 4-6 shows total content views since January 2015 indicating a similar growth pattern, as previously noted, with peaks occurring in the months of January and an overall decrease in content views since March 2020.

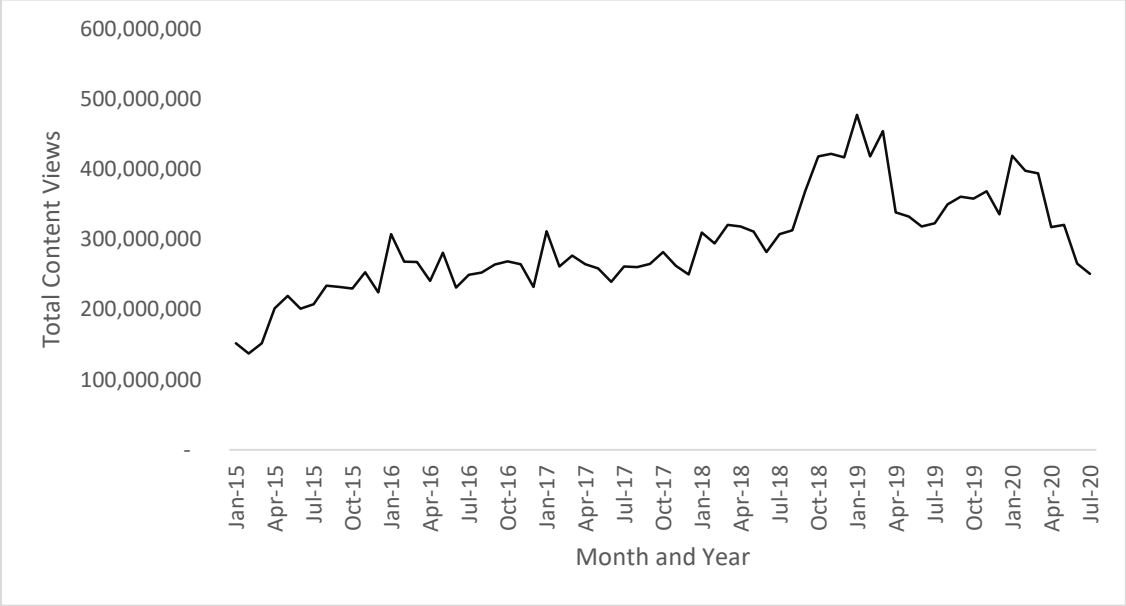

Figure 4-6. Total Content Views.

Figure 4-7 shows specific content areas or textual assets viewed since January 2018. Several results or features are worth noting. The most frequently viewed asset in Gospel Library is the Book of Mormon; however, for a short period between January 2019 and December 2019 the New Testament rivaled the Book of Mormon and even briefly surpassed it. The Old Testament was the second most viewed content area from January 2018 to December 2018. Come Follow Me-NT and Come Follow Me-BoM represent two manuals that encourage a church-wide synchronized guided study of the New Testament and the Book of Mormon respectively. Come Follow Me-NT was the third most viewed content during the same year that the New Testament was viewed frequently—2019. Since 2020, Come Follow Me-BoM is the second most viewed content area after the actual Book of Mormon text. Other notable patterns can be seen in Figure 4-6 such as a stable yet inconspicuous history of Hymn views and a cycling

pattern of new General Conference views during a six-month period. General Conference views represent regular sermons or messages given by church leaders every six months and app users return to view those sermons during that interval between each General Conference. Other assets or content views (such as various manuals, handbooks, and history books) are also measured and tracked; however, their overall views rarely reach a minimal threshold and they are viewed significantly less than any other content area shown in Figure 4-7.

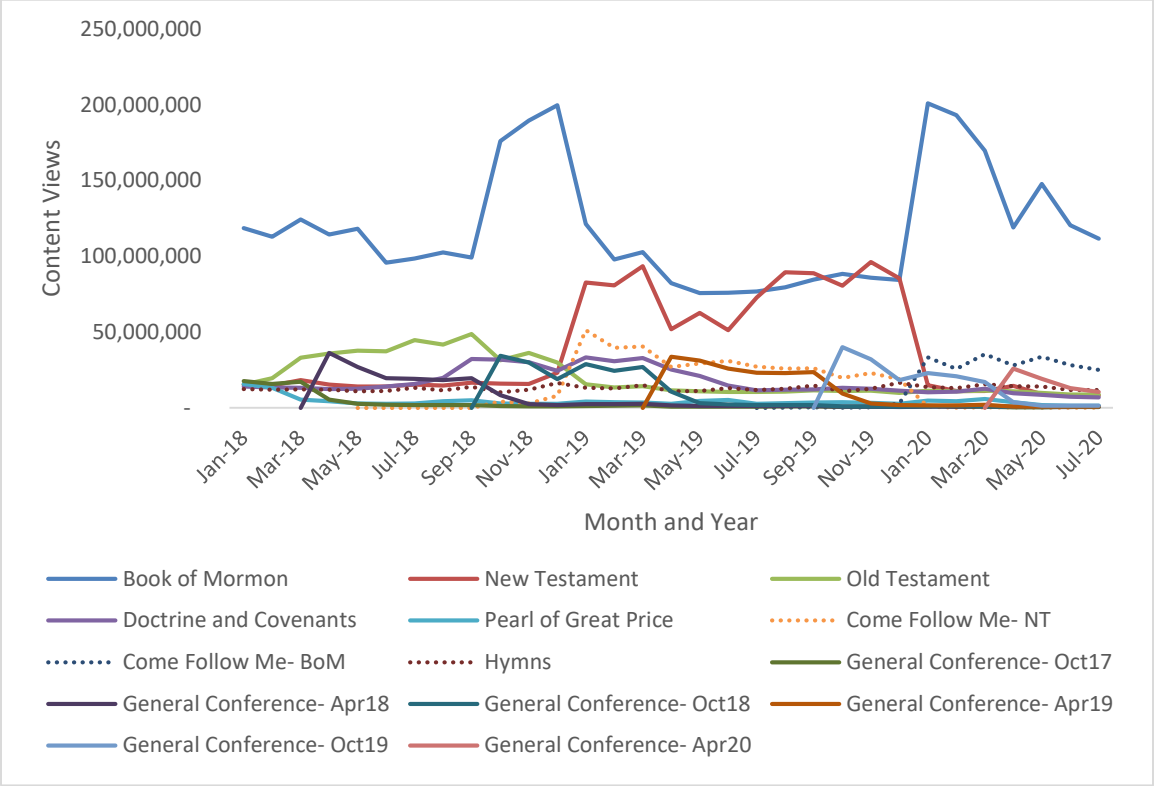

Figure 4-7. Specific Content Area Views.

Annotations and Other Affordances

Table 4-5 shows the counts of different types of annotations and affordance use per month during the previous year, in order of prominence. Annotations are divided into highlighting, bookmarking, tagging, adding notes, and linking. Highlighting is more frequently recorded than any other annotation because highlighting is required before a user can engage any other annotation function with a portion of text such as bookmarking or sharing. Table 4-5 also shows average monthly usage of other affordances or features such as audio plays, video plays, content sharing instances, searches performed, and study plans created or scheduled. Notably used affordances can be seen in the large number of audio plays (52% of total measured affordance use), followed by much less highlighting (27%), video playing (7%) and searching (5%). Average affordance usage per active users (3.3 million active users) has also been calculated to show that, on average, active users highlight text six to seven times each month, bookmark a location about once a month, and tag text or add a note every other month. Much more frequently, active users utilize the audio listening affordance or feature in Gospel Library on average of 13 times per month but only watch videos or perform a search a little more than once a month. Those same users make use of the sharing affordance once every five months. However, considering that only one-third of active users regularly annotate (about 1 million users) it may be argued than those users are engaging those same affordances or features three times more often per month than is shown in the table.

Table 4-5

Distribution of Annotation Type and Affordance Use, Averaged Over Previous Year

Type of "Annotation"	Average Counts per Month	Average Counts per Month per Active Users	Percentage of "Annotations"	Percentage of Total
Highlighting	22,590,291	6.85	75.86%	27.14%
Bookmarking	3,561,955	1.08	11.96%	4.28%
Tagging	1,738,377	0.53	5.84%	2.09%
Adding Notes	1,623,132	0.49	5.45%	1.95%
Linking	266,048	0.08	.89%	.32%
Other Affordances				
Audio Plays	43,257,084	13.11		51.98%
Video Plays	5,619,922	1.70		6.75%
Searches	3,814,202	1.16		4.58%
Shares	677,583	0.21		.81%
Study Plans Created	72,777	0.02		.09%

Figures 4-8 through Figure 4-12 display the tracked instances of specific affordance usage over time. It is important to note the irregularity in Figure 4-9 between October 2018 and April 2019 which represents unreliable data according to the Gospel Library design team, the data for that interval was therefore omitted. Data for Figures 4-10 through 4-12 were only measured since January 2019. The study plans shown in Figure 4-12 are associated with the same specific content areas shown previously in Figure 4-7. These figures show steadily increasing use of affordances with time including peak usage in March 2020 with a notable decrease thereafter. Study plan creation peaked in January of 2020 and then steadily decreased from that point.

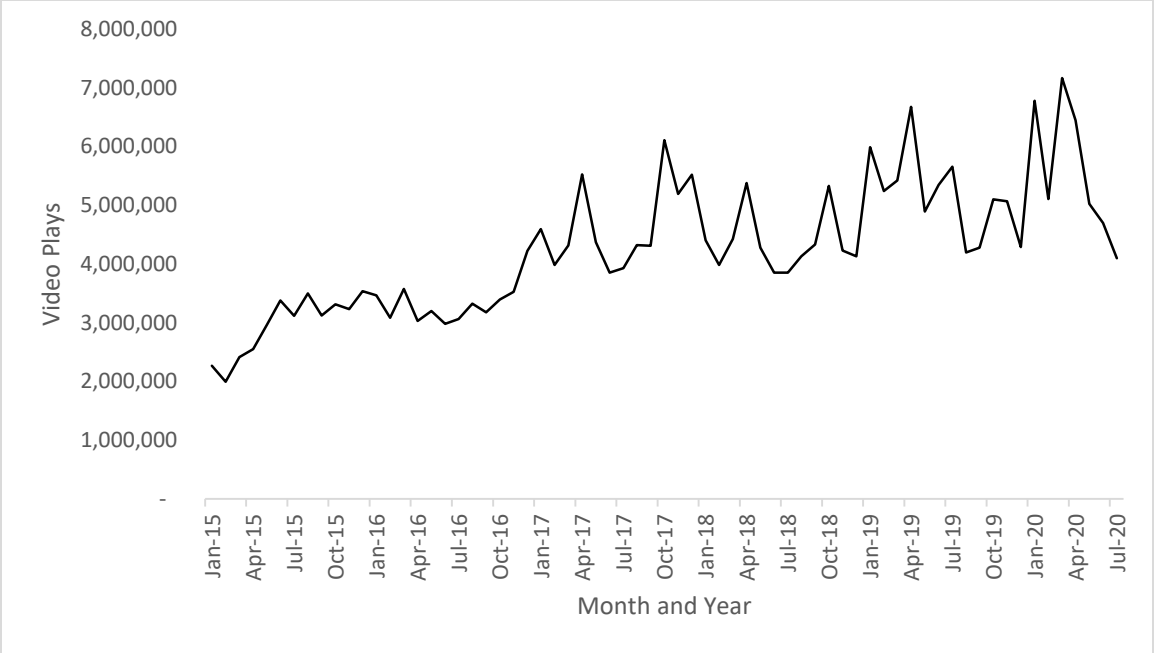

Figure 4-8. Total Video Play Counts.

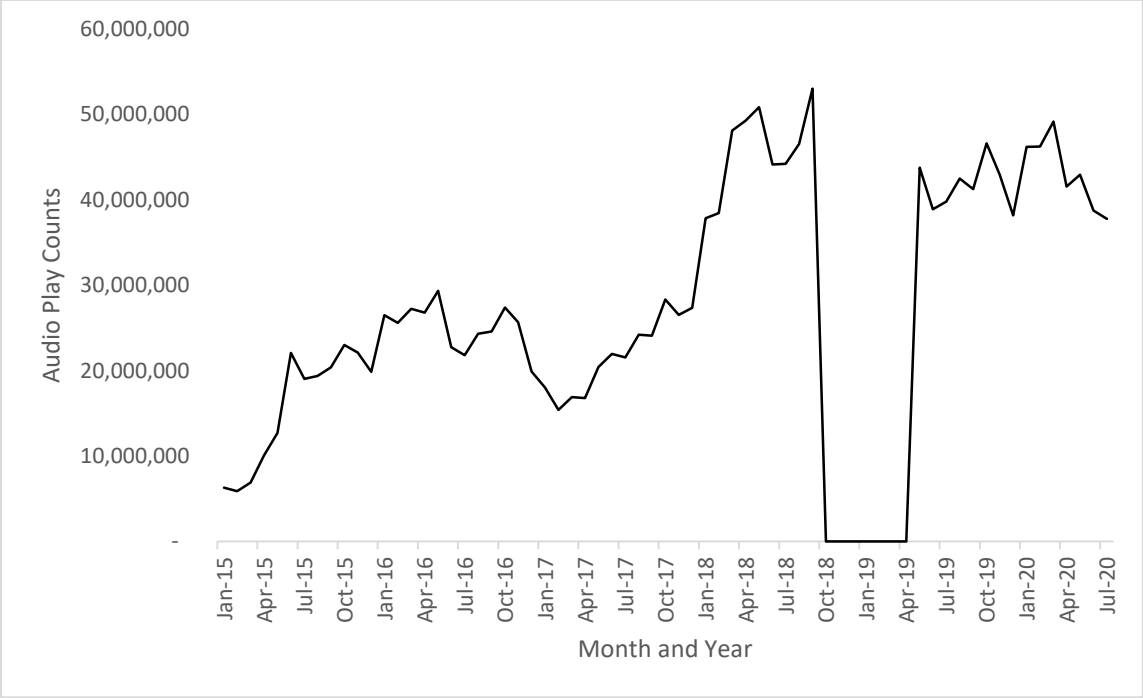

Figure 4-9. Total Audio Play Counts.

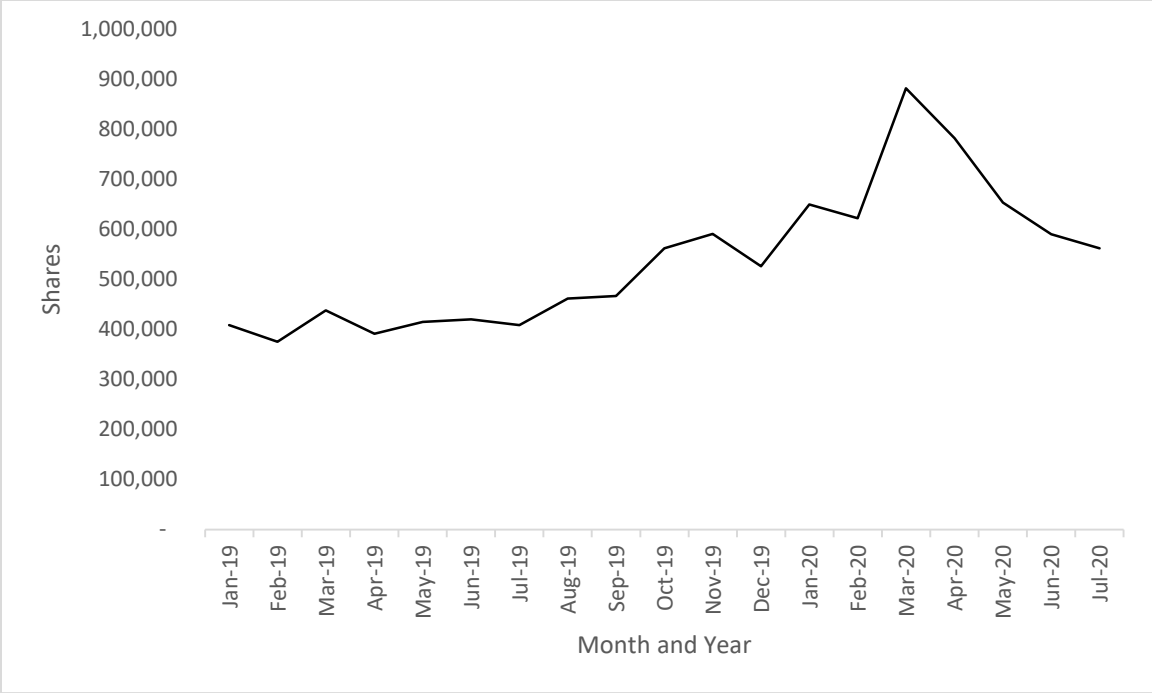

Figure 4-10. Total Times Content Was Shared.

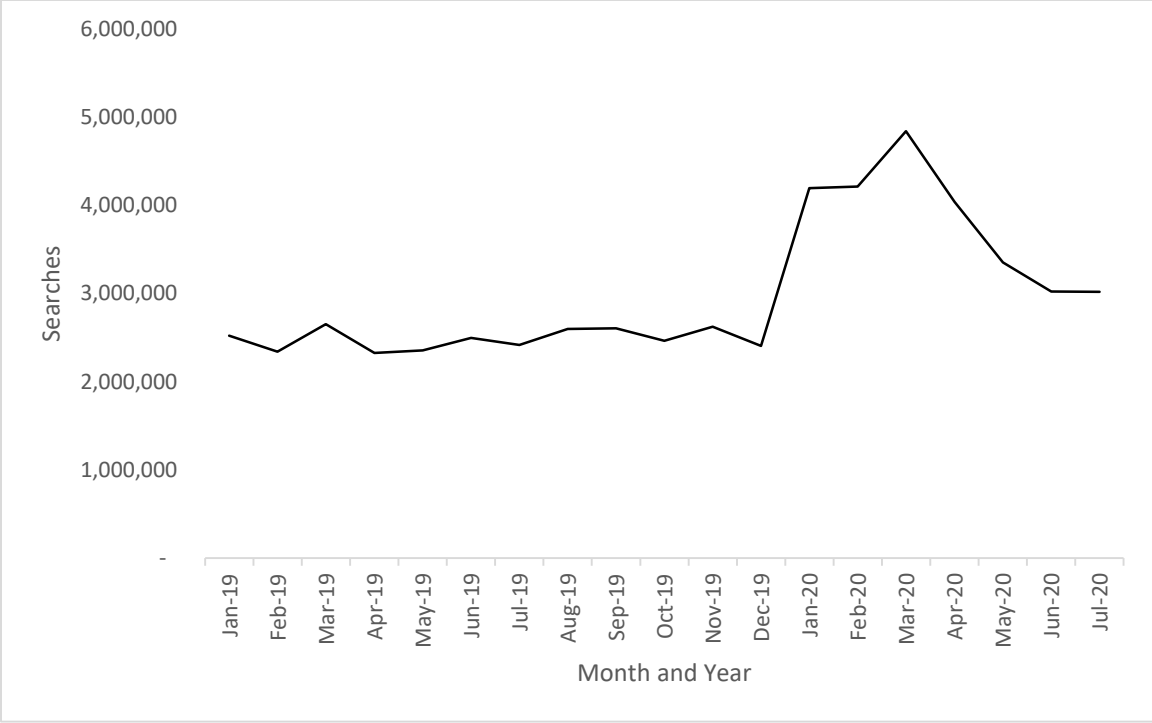

Figure 4-11. Total Searches Performed.

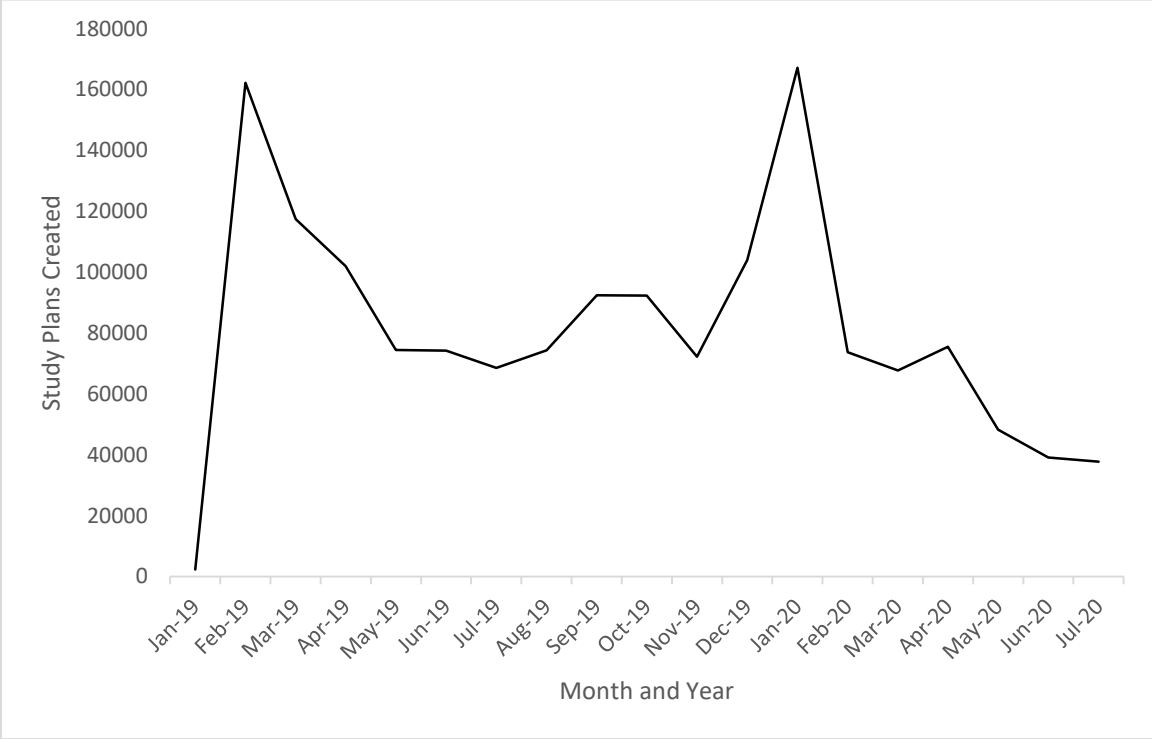

Figure 4-12. Total Study Plans Created.

Other guiding questions that were developed to direct specific data gathering efforts were not able to be answered or had to be inferred. For example, the Gospel Library team either does not track or did not grant access to see deeper connections between affordances such as whether study plans are associated with increased frequency of daily app use. Further, only minimal demographic information was available such as the difference in overall app usage between US/Canada and international usage. Furthermore, data were not available that can currently answer if affordance usage behaviors are moderated by specific content areas or text genres within Gospel Library.

In summary, user analytic data show a number of key results regarding how, or in what ways, a selected sample of Gospel Library app users have utilized the designed

affordances and limitations of the app. In particular, usage data for the past several years show that Gospel Library is accessed by around 3 million active users who typically spend an average of a little less than three hours per month in the app (an average of about six minutes per day). Even though only 7 of 16.5 million (42%) Latter-day Saints live within the US and Canada, 71% of active Gospel Library users live in those countries. Only about one million of the total users actively annotate within the app including highlighting, bookmarking, tagging, adding notes, or creating content links. Gospel Library is used more on Sundays than any other single day of the week, but Sunday usage has stayed constant, and overall increased app usage across the past five years is mainly from growth in weekday use.

Furthermore, app affordance usage has likely been affected by COVID-19 in a number of ways. Most affordance usage such as annotating, audio listening, video watching, content sharing, and searching has steadily increased over the past several years while peaking at or near March of 2020. However, from that time until data collection in the summer of 2020, regular in-person Sunday worship services have been suspended, and thus Gospel Library usage has declined because it is more heavily used on Sundays during church meetings. Regardless, users tend to utilize audio listening more than any other affordance followed by highlighting which combined account for about 80% of the overall affordance usage. Video playing, searching, and bookmarking each account for about 5% of overall affordance usage, while note-taking and sharing combined account for only about 3%. Lastly, user analytic data show a number of important trends and patterns in specific content area viewing within the app which may illuminate religious or cultural values among Latter-day Saints as discussed in Chapter V.

CHAPTER V

DISCUSSION

While the aim of the previous chapter is to report and describe the results of the study, this chapter will seek to frame and interpret the results, offer possible implications, and give direction for future research. Previous research indicates the use of mobile media for religious purpose has developed and flourished rapidly in recent years (Hutchings, 2015a, 2017). However, as the practice of digital sacred text reading has increased, the research around its design, use, and implications has not kept pace. In particular, scholars have called for studies that simultaneously investigate the design and use of digital sacred text apps within religious communities or groups (Bellar, Cho, & Campbell, 2018). Furthermore, researchers have beckoned for data that rely on app developers to share their perspectives and design intentions, as well as user analytic data (Hutchings, 2015b).

Therefore, using a framework of Affordance Theory (Gibson, 1979), the aim of this study is to build on previous research (Bellar, 2017; Bellar et al., 2018) by concurrently analyzing and describing the design and use of a digital sacred app, Gospel Library. In addition, this study contributes to the field by offering procedures for obtaining data on digital scripture app usage. Following the procedures previously outlined, this study describes the design of Gospel Library through analysis of online app store descriptions, an app walkthrough protocol, and interviews with the app developers. User analytic data from the Gospel Library design team was also gathered, analyzed, and described to better understand app affordance usage behavior patterns.

Interpretation of Results

The design of Gospel Library follows similar patterns as other major or popular sacred text apps currently on the market. Key affordances or features are embedded in Gospel Library as in other digital scripture apps such as audio listening functions, search tools, bookmarking, sharing abilities, annotations, and more. However, there are a couple of critical differences between the design of Gospel Library and other sacred text apps. The most notable distinction is the lack of multiple English translations of the Bible. Most Bible apps afford several different renditions or translations of the Biblical text, except apps specifically marketed as particular Bible versions. Gospel Library does feature text in different languages; however, only one version in any given language is provided. Interviews with the Gospel Library app team confirm this is an intentional choice. In the design team's own words:

> It's a church position that we unify on the King James version of the English scriptures. We do have various versions of the Bible, but it's all one per language, so Reina Valera is the Spanish standardized unified transitional Bible we study from. … I've never actually heard any feedback from our users that they're requesting other versions. So, there's not a real need; there hasn't been a real big pull for it as far as I know.

The Gospel Library design team indicates the omission of multiple English translations is due to both a top-down institutional value as well as the absence of bottom-up user feedback. Hence, the lack of this feature may illuminate a complex processes of affordance design and cultural norms demonstrated by the theoretical framework of this study (Figure 5-1).

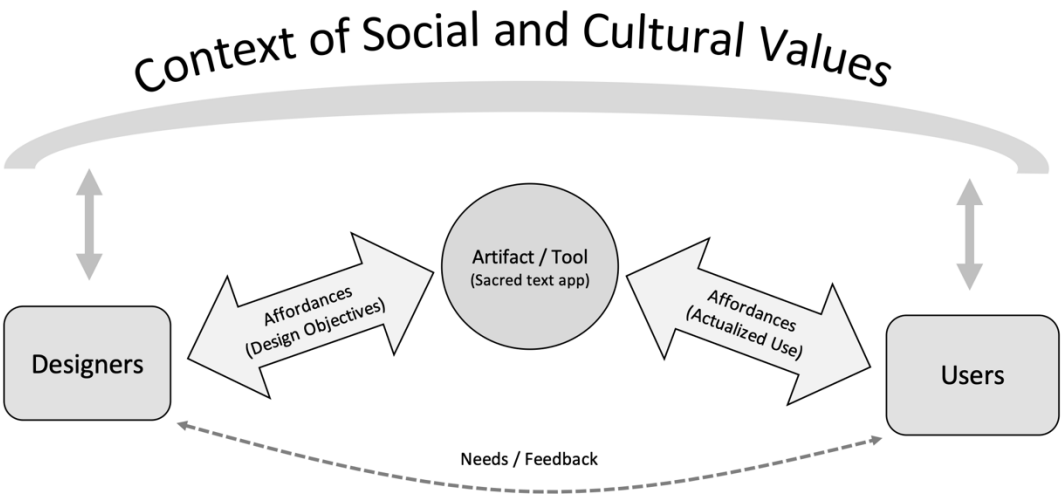

Figure 5-1. Conceptualized Theoretical Framework.

The lack of multiple English translations in the Gospel Library suggests that the design of digital scripture apps may be influenced by both institutional values and user demands. However, designers and users are both surrounded and embedded in a cultural context that may be difficult for either group to identify. Meaning, the Gospel Library team may consider adding additional English Bible translations if users overwhelmingly requested it; however, Latter-day Saints who largely use the Gospel Library app may not ask for other English translations because they do not think their church allows, encourages, or even authorizes them.

This chicken-or-egg quandary can be further illuminated by the stark absence of another affordance in all Islamic Qur'an apps analyzed for this study. No digital Muslim Qur'an app was found that included highlighting as an affordance or feature. In contrast, highlighting is one of the most frequently available and advertised affordances among Christian Bible apps. This finding is likely due to overarching cultural values or norms. Specifically, as described in Chapter II, Protestant Christians value a heavily marked and

well-worn Bible as an indication of faithfulness. However, Muslims are encouraged to never mar or desecrate their sacred texts with penciled scribbles. Therefore, would Muslim Qur'an apps not have highlighting features designed into them because the design organization does not wish to encourage marking, or is it because users have never asked for that feature? Regardless, a value statement can be inferred: Muslims do not value highlighting the Qur'an and Latter-day Saints do not seem to value other English translations of the Bible.

This pattern of mutually reinforcing cultural values between designers and users supports previous research by Hutchings (2017) who argues that digital Bibles are designed around specific denominational religious priorities. Furthermore, findings support Bellar et al. (2018) who contended mobile devices affordances align with religious community's values. Bellar et al. state, "app developers and designers are either already traditional religious authorities, or become a type of religious authority through employing or not employing specific affordances in app design" (p. 6165).

Another supporting example can be seen in the priority that the Gospel Library design places on specific content areas within the app. The Gospel Library app is uniquely situated among other digital religious text apps because it offers vastly more content assets (most of which are unique to Latter-day Saints) such as the Book of Mormon, magazines, manuals, General Conference sermons or messages, and much more. User analytic data demonstrates notable patterns in specific content areas users access most frequently. Historically, the Book of Mormon is read more than any other content asset in the Gospel Library app, more than the New Testament, Old Testament, or any manual. Since January 2020, The Church of Jesus Christ of Latter-day Saints has

encouraged a church-wide week-by-week study of the Book of Mormon and the design team of Gospel Library has supported and encouraged this study effort by placing a prominent quick link to the Book of Mormon study material on the home page of the app. Therefore, a question may be considered: are the designers of the Gospel Library app encouraging or scaffolding users to access the Book of Mormon more frequently, or did the frequent use of the Book of Mormon encourage designers to make a quick link more readily accessible? Interviews with the design team suggest both factors contributed, thus another cultural claim may be warranted, Latter-day Saints value the Book of Mormon.

Two more claims can closely follow, Latter-day Saints appear to value church-directed scripture reading plans and they value bi-annual sermons or messages from church leaders. After the Book of Mormon, the next most accessed content assets are specific scripture books on which the church focuses in a yearly cycle. For example, during 2018 the church focused on the Old Testament and that book of scripture was the second most accessed asset in Gospel Library during that time. For the duration of 2019, the church focus was the New Testament and that content asset was the second most accessed in Gospel Library followed by an associated study guide manual, Come Follow Me. In 2020, the Book of Mormon and its associated Come Follow Me study guide manual were highly accessed.

Another cyclic pattern emerges in the data with semi-annual sermons or messages from church leaders labeled General Conference. Every six months in April and October, church leaders deliver church-wide sermons. In Gospel Library, these sermons are accessed frequently during that six-month time period and are then not viewed as

frequently while the next set of semi-annual sermons increase in viewership. The importance of General Conference sermons or messages can also be seen by the prominence of the placeholder image for these content assets. On the main home page of Gospel Library, General Conference is statically featured as one of the first or top content areas.

These findings stand in opposition to claims by some scholars that the proliferation of digital mobile religious text will inevitably erode traditional religious authority and cultural norms (Beaudoin, 1998; Wagner, 2012, 2013). The findings of this study suggest that the design of religious apps may be closely following and reinforcing the religious expectations and practices of users. Rackley's (2014) work may help illuminate another connection between Latter-day Saint scripture reading practices and the design of their digital sacred texts. Rackley describes different cultural reading practices between Methodists and Latter-day Saints:

> Methodist youths engaged in an active construction of meaning with scripture, situated within a culture of interpretation and discussion of religious texts. Latter- day Saint youths privileged a passive reception of meaning from scripture, situated within a culture of listening. (p. 417)

Rackley argues that Latter-days Saints tend to operate in a culture that values knowing content or reading scripture and listening to what others say about it with very little question asking. In contrast, Methodists tend to engage more actively with sacred text through discussion, interpretation, and application. The design of Gospel Library may be seen to support or prioritize an individualized or personal reading experience with limited interactions such as personal marking and notations, but also limited engagement with other people. There are no forums, discussion boards, or group chats that facilitate community interpretation and dialogue. Furthermore, several manuals, essays, and

commentaries offer vast amounts of predetermined explanations and institutional interpretation. Yet, some attempts are made to allow for social interactions within Gospel Library through allowing content sharing. Moreover, user analytic data may be seen to support a Latter-day Saint culture of listening over discussing as audio playing is by far the most frequently utilized affordance followed by highlighting, videos, searching, then sharing.

In contrast, other Protestant digital scripture apps place more priority on social discussions and community interpretation. The most popular digital scripture app on the market, YouVersion, also has some of the most unique social and performance feedback affordances. For example, YouVersion, which is designed by an Evangelical Protestant group, prioritizes proselytizing by allowing users to create scripture-based visual images or memes and encourages sharing them through a variety of social media platforms. In addition, the app allows users to create groups within the app and invite friends to join in discussions or dialogues about Bible content. YouVersion also demonstrates value in daily Bible interaction through prominent home-screen performance feedback mechanisms such as showing users their streak count for how many consecutive days they have interacted with the app. The Gospel Library interviewees indicated that they wish to include affordances like these in the future, including streaks, verse-of-the-day notifications, and more social connectivity. However, to date, these features have not been prioritized into the design of the app. Yet interviews with the Gospel Library team indicate that internal church organization decisions are continuing regarding which affordances or features are appropriate in Gospel Library or whether other church-owned apps are more suited for specific social functioning.

Interviews with the Gospel Library team suggest that they view the app as a way to disseminate the church's content or material as well as provide users with a revelatory experience. A revelatory experience may be interpreted similarly to a "dual-context communication event" (Malley, 2004) in which Bible readers are expecting to understand the message of the sacred text while also anticipating potentially unrelated direction from the text about how to conduct their lives. Gospel Library can be seen to support this by providing a large amount of church produced content with the potential availability to highlight text and make personal notes regarding content. However, without further clarification, it may be difficult to clearly delineate other ways in which Gospel Library supports personal revelatory reading experiences for users. For example, provisions in the app are made for only limited training or support for how to approach scripture study to create a revelatory experience. There are subtle suggestions present in some content areas such as recommendations or prompts for users to "Record Your Impressions" in the Come Follow Me material. There are also other inconspicuous manuals in Gospel Library about scripture study approaches and revelation; however, overarching and transparent structures and supports do not seem to be built into the design or common reading experience of Gospel Library. These structures to encourage, support, or facilitate revelatory dual-context communication events for users could include features such as the inclusion of training modules, videos, overt suggestions and prompts, study templates, or social support beyond marking, annotation, or sharing.

Previous research demonstrates techniques or approaches that Latter-day Saints use to find clarity and meaning from paper-based sacred text to overcome several obstacles such as archaic language and complex literary devices (Rackley & Kwok,

2016). These approaches or strategies include drawing inferences, making comments, making connections, recognizing confusion, using prior knowledge, using interpretive questions, visualizing, summarizing, comparing, and making real-life applications or problem solving (Rackley, 2015, 2017, 2018). Furthermore, scripture readers have been found to persist through complex sacred text because they desire to feel strengthened, comforted, connected to God, learn about their religion and new ideas, and how to live and apply scriptural teachings. However, Gospel Library does not seem to explicitly support or encourage most of these practices in any substantial way beyond making the text available (including audio, videos, manuals, sermons, and a reading scheduler) and allowing users to annotate, search, and share.

Limitations

In making these interpretive claims, it may be important to clarify that the larger culture of Latter-day Saints may or may not actually value other English translations of the Bible, the Book of Mormon, church-directed scripture study efforts, semi-annual sermons, and passive or individualistic reading experiences; however, the purpose of this study is to describe and analyze what is presently communicated in the design and use of Gospel Library as it relates to the larger research conversation regarding digital sacred text. This study is limited by analyzing only one tool or artifact from the Latter-day Saint community, the Gospel Library app, which only has about 3 million active users while there are more than 16 million Latter-day Saints globally. Furthermore, this study is limited by the descriptive nature of the study design. No variables were manipulated; therefore, no causations or significant correlations were investigated. Moreover,

limitations were presented by only analyzing the previously accumulated user analytic data that was graciously made available by the design organization. In addition, only the current design of Gospel Library was analyzed, not previous iterations; and, only two interviews were conducted—one with the product manager and one with the user experience designer, not other currently or previously invested stakeholders or designers.

Implications and Significance

This study may present several implications for the design and use of digital sacred texts. A number of key findings from this study may be seen to support previous research suggesting that digital religious texts may not be eroding traditional religious norms; instead, they are likely designed for religious adherents to perpetuate their cultural religious values and practices (Bellar et al., 2018; Hutchings, 2017). Moreover, this study contributes to previous research by adding light on specific cultural reading practices that are valued among religious readers, specifically Latter-day Saints (Rackley, 2014, 2015, 2016). Supporting findings include the value that Latter-day Saints place on the following features based on the design and use of Gospel Library affordances: the King James version of the English Bible, the Book of Mormon, directed scripture study efforts, sermons from church leaders, and audio listening to sacred text. Moreover, the lack of other social-based affordances aligns with Rackley's findings that Latter-day Saints may not value social forums and group discussions as a means of interpreting scriptural text.

Furthermore, this study contributes previously unrepresented user analytic data to the larger conversation about digital sacred text and even more broadly about digital

reading generally. In particular, previous methodologies (Bellar, 2017; Light et al., 2018) have been extended by this work to show ways of working with design organizations to conduct interviews and access user analytic data. App usage data represent a much more objective and authentic way of measuring ways readers are actually interacting with digital sacred text than users self-reporting (Hutchings, 2015b).

This work may also have implication for the future design and use of religious apps. Religious app designers may not always reflectively analyze the values their organization or group holds and how those values are communicated and supported in the design of their apps. For example, if Latter-day Saints do value other English translations of the Bible, then they may consider designing that affordance into Gospel Library. If they wish to support daily scripture reading habits, social discussion, or revelatory reading experiences, then Latter-day Saints may want to prioritize providing features that encourage or scaffold those behaviors such as reading performance streaks, chat forums, or similar affordances. Specifically, Rackley's work (2015, 2017, 2018) articulates approaches or strategies Latter-day Saints have used to find meaning from scripture (drawing inferences, making comments, making connections, recognizing confusion, using prior knowledge, using interpretive questions, visualizing, summarizing, comparing, and making real-life applications or problem solving). Therefore, Gospel Library could intentionally have features or affordances designed to support and encourage readers with those practices or strategies. For example, templates, modules, videos, sharable study plans, or home screens could be designed to encourage users to ask questions about what they are reading, make relevant summaries, inferences,

applications, or create sharable content based on what they are learning or what connections are being made.

Lastly, religious educators or leaders may benefit from taking advantage of the unique affordances and features of different religious apps or even knowing the distinct role that paper or print mediums may play. For example, if a religious group wishes to encourage daily scripture reading habits, social discussions, and the use of other English translations, then they may benefit from using a digital sacred text app that affords those features such as YouVersion. Furthermore, it may be helpful for religious leaders or teachers to consider the unique affordances offered between digital apps and traditional paper scripture. In particular, a religious person may wish to use Gospel Library to conveniently and portably access Bible videos and audio or quickly search text; however, they may find fewer distraction reading a printed Bible. Lastly, this study has implications for future research as described in the following section.

Future Research

In response to calls from prior research, this study investigated the design and use of a specific digital sacred text app. However, more research is needed about the effects of digital sacred text reading. Specifically, differences between print and digital interfaces need to be understood better. Future studies could conduct comparative analyses to investigate the differences between how religious readers interact with paper scripture verses digital scripture or the effects on variables such as comprehension.

Moreover, although many religious groups claim they value daily reading or interactions with Biblical text, it is not yet known if digital scripture apps actually

increase the length or frequency of daily use. It is also not yet known if users find digital interactions with sacred text more spiritually, socially, or devotionally meaningful, and why or why not. Future studies could build on previous work by investigating these questions. Additionally, future studies could use methodologies similar to this study to gather more objective user analytic data to better understand how digital sacred text is read across other religious groups. More work is also needed to better understand how or in what ways religious readers interact with sacred text that exerts such a seemingly powerful influence on them.

Conclusion

Religion and religious practices, especially sacred text reading, are important to a large part of the world's population (Lindsay, 2007; Prothero, 2007; Rackley, 2018). The way people read and interpret sacred text has been shown to significantly influence identity and behavior (Rackley, 2016). However, with little information currently available about how religious text is read, this study adds to a growing conversation, awareness, and understanding about religious literacy practices.

Research suggests that digital reading may never completely supplant traditional print text reading practices as each medium or substrate supports uniquely desired affordances and reading experiences (Mangen & van der Weel, 2016; Ross et al., 2017). For example, digital sacred text can afford audio listening, video content, quick searching functions, and ever-present convenience and portability. These assets can be seen in the design and use of Gospel Library. However, digital sacred text does not seem to currently, nor in the foreseeable future, compete adequately with paper-based affordances

such as physical and spatial familiarity with text location, less distraction, deeper reading, and haptic connection with the touch, feel, smell, and experience of paper (Delgado et al., 2018; Gorichanaz, 2016; van Peursen, 2014). Religious groups will likely continue to design and use digital sacred text in ways that support their cultural norms or values and reading practices, and the use of digital scripture will likely continue to rapidly grow in the future. Nevertheless, both paper and digital sacred text seem to afford unique and valuable features for religious readers.

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APPENDICES

APPENDIX A

Definitions of Sacred Text App Affordances

Affordance	Definition
Audio Listening.....	Ability to listen to text being read or spoken out loud
Multiple Versions/Translation.....	App offers more than one translation or version of sacred text in a given language
Search Tools.....	Includes features or functions that allow text to be digitally searched
Bookmarking.....	Allows users to save a location in text to return to at a later time
App Navigation Ease or Beauty....	Advertises that the app is easy or intuitive to navigate, or that the app is aesthetically appealing
Sharing Ability.....	Includes features or functions that allows users to share app content with other users or contacts
Private Notes.....	Allows users the ability to input their own user generated content as text-based notes
Highlights.....	Allows users to color or mark text (underline or highlight)
Customization.....	App offers any ability to change settings, functions, or organization of the app
Commentaries.....	Includes explanatory text beyond scripture in the form of manuals, books, or sermons
Convenience/Portability.....	Advertises the apps ability to make reading more convenient or accessible
Authority/Official Content.....	Advertises that app content is authorized or official from a religious figure or organization
Notifications.....	App can send users reminders, announcements, or notifications.
Reading Plans.....	App offers specific reading plans or paths through the text that are non-linear or non-sequential
Deeper Study Features.....	App advertises that it assists users to study more deeply that superficial reading
Night Reading.....	Ability to adjust screen brightness settings or coloration for easier reading in dim environments
Pictures/Maps.....	App includes pictures or maps as study aids
Personal Tracking.....	App allows users to track reading performance or behaviors
Lifestyle (prayers, food, meeting).	Assists users with performing religious behaviors or rituals

Videos.....	Provides content videos which users can watch
Music/Radio.....	App features music or live radio to which users can listen
Performance Feedback.....	Provides users to feedback about their reading performance or behavior, such as streaks or
Memorization Aids.....	Offers tools to assist users to memorize text passages
Community Dialogue.....	Allows multiple users to engage in synchronous or asynchronous messaging or chat forum
Pronunciation Aids.....	Provides users with correct phonetic or pronunciation guidelines
Content Creation.....	Users can use app to create pictures, memes, or other content
Public Notes.....	Allows users to collaborate or share notes with other users
Location Based Services.....	Tracks users' geographic location and offers services or suggestions based on location
Community Tracking.....	Allows other users to see reading performance or behavior, such as streaks or badges

APPENDIX B

Interview Protocol for Gospel Library Design Team

Purpose of study, confidentiality, consent to use and record.

Interview Questions:

(Follow-up prompts: yes, uh-huh, interesting, tell me more about…, mirror back.)

a. Walk me through a typical day or week in your work?

b. How would you describe the purpose, scope, or commission of Gospel Library and your work as a designer?

c. Who is the target audience and their intended scenario(s) of use for Gospel Library?

d. What would you describe as your design priorities for Gospel Library?

e. What would you describe as your design boundaries or limitations?

f. Based on previous analysis, the following design features or affordances were identified in other popular sacred text apps but not in Gospel Library, why do believe these features are not included in Gospel Library? (insufficient resources, intentional design choices, unintentional design choices, or other reasons). Such affordances may be features like offering multiple Bible translations, study plans or paths, notifications (verse of the day, new video or content, have you checked this out…, performance feedback (streaks and badges), social group circles or discussion boards etc.

g. Are there features or affordances that you would like to include in the design of Gospel Library, but are out of your scope or resources? What are they?

h. Are there features or affordances that you do not want to design into Gospel Library because it is out of your scope or priorities? Which?

i. Tell me about the past of Gospel Library, what major changes in its design have taken place, and what prompted those changes to take place?

j. Tell me about the future of Gospel Library, what do you foresee happening with its design in the next year and beyond?

k. Lastly, I want to collect a little information about you. How long have you been working as a designer/manager for Gospel Library? Tell me about any experiences, training, or previous work that brought you to this position?

l. Thank you for taking your time to visit with me today. What will be the best way for me to contact you with any further questions and to give you a copy of my report to get further feedback or clarification from you?

APPENDIX C

Coding Sheet for iTunes App Store Descriptions

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Affordance	Bible (YouVersion)	#Bible	Bible.	Gospel Library	Muslim Pro
Audio Listening	x		x	x	x
Multiple Versions/Translations	x		x		x
Search Tools	x			x	
Bookmarking	x				
App Navigation Ease or Beauty	x				
Sharing Ability	x	x		x	
Private Notes	x		x	x	
Highlights	x		x	x	
Customization	x	x	x		
Commentaries				x	
Convenience/Portability					
Authority/Official Content				x	x
Notifications		x			x
Reading Plans	x		x		
Deeper Study Features				x	
Night Reading			x		x
Pictures/Maps		x		x	
Personal Tracking			x		
Lifestyle (prayers, food, meeting)					x
Videos		x	x	x	
Music/Radio					
Performance Feedback					
Memorization Aids	x				
Community Dialogue					x
Pronunciation Aids	x				
Content Creation	x				
Public Notes					x
Location Based Services	x				
Community Tracking	x		x	x	x

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Affordance	Verses	JW Library	Bible Gateway	Blue Letter Bible	Bible App by Olive Tree
Audio Listening			x	x	x
Multiple Versions/Translations	x	x	x	x	x
Search Tools		x	x	x	x
Bookmarking		x		x	x
App Navigation Ease or Beauty		x	x	x	x
Sharing Ability			x	x	x
Private Notes			x	x	x
Highlights			x	x	x
Customization				x	x
Commentaries		x	x	x	x
Convenience/Portability					x
Authority/Official Content		x	x		
Notifications			x		
Reading Plans			x		x
Deeper Study Features				x	x
Night Reading			x		x
Pictures/Maps					x
Personal Tracking	x				x
Lifestyle (prayers, food, meeting)		x			
Videos		x			
Music/Radio					
Performance Feedback	x				
Memorization Aids	x				
Community Dialogue					
Pronunciation Aids					
Content Creation					
Public Notes					
Location Based Services					
Community Tracking					

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Affordance	Daily Bible Inspirations	NIV Bible App +	Bible Verses: Daily	The Study Bible	Bible in One Year
Audio Listening		x		x	x
Multiple Versions/Translations	x	x		x	x
Search Tools			x		
Bookmarking		x		x	
App Navigation Ease or Beauty		x			
Sharing Ability	x		x		
Private Notes	x	x		x	
Highlights		x		x	
Customization	x	x	x	x	
Commentaries		x		x	x
Convenience/Portability		x			x
Authority/Official Content	x			x	x
Notifications	x	x	x		x
Reading Plans		x		x	
Deeper Study Features		x			
Night Reading		x			
Pictures/Maps	x	x	x	x	
Personal Tracking					
Lifestyle (prayers, food, meeting)					
Videos					
Music/Radio					
Performance Feedback					
Memorization Aids					
Community Dialogue					
Pronunciation Aids					
Content Creation					
Public Notes					
Location Based Services					
Community Tracking					

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Affordance	Bible.is	Our Daily Bread	Quran Majeed	Logos Bible Study Tools	Quran Pro Muslim
Audio Listening	x	x	x	x	x
Multiple Versions/Translations	x	x	x	x	x
Search Tools	x		x	x	
Bookmarking	x	x	x		x
App Navigation Ease or Beauty				x	x
Sharing Ability	x	x	x	x	
Private Notes	x	x		x	
Highlights	x			x	
Customization	x		x	x	
Commentaries				x	
Convenience/Portability	x	x	x	x	x
Authority/Official Content		x	x		x
Notifications		x	x		
Reading Plans				x	
Deeper Study Features				x	
Night Reading					
Pictures/Maps					
Personal Tracking					
Lifestyle (prayers, food, meeting)			x		
Videos	x				
Music/Radio			x		
Performance Feedback			x		
Memorization Aids			x		
Community Dialogue		x			
Pronunciation Aids					
Content Creation					
Public Notes					
Location Based Services			x		
Community Tracking					

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Affordance	ESV Bible	Bible Hub	Daily Bible Verse Inspirations	30 Day Bible Study	NKJV Bible by Olive Tree
Audio Listening	x			x	x
Multiple Versions/Translations		x		x	x
Search Tools	x	x		x	
Bookmarking	x		x	x	x
App Navigation Ease or Beauty	x		x	x	x
Sharing Ability	x		x	x	
Private Notes	x			x	x
Highlights	x			x	x
Customization				x	x
Commentaries	x	x		x	x
Convenience/Portability	x			x	x
Authority/Official Content	x	x			
Notifications			x		x
Reading Plans	x			x	x
Deeper Study Features	x			x	x
Night Reading					x
Pictures/Maps			x		x
Personal Tracking				x	
Lifestyle (prayers, food, meeting)					
Videos					
Music/Radio					
Performance Feedback					
Memorization Aids					
Community Dialogue					
Pronunciation Aids					
Content Creation					
Public Notes					
Location Based Services					
Community Tracking					

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Affordance	Holy Bible	One Bible	iQuran	Eqra'a Quran Reader	Faithlife Study Bible
Audio Listening		x	x		
Multiple Versions/Translations	x	x	x		x
Search Tools	x	x	x		
Bookmarking		x	x	x	
App Navigation Ease or Beauty	x	x	x	x	
Sharing Ability	x		x		x
Private Notes	x	x	x		x
Highlights	x	x			x
Customization	x	x	x		
Commentaries					x
Convenience/Portability		x			
Authority/Official Content					
Notifications		x	x		
Reading Plans	x	x			
Deeper Study Features	x	x			x
Night Reading					
Pictures/Maps					x
Personal Tracking					
Lifestyle (prayers, food, meeting)					
Videos					x
Music/Radio					
Performance Feedback					
Memorization Aids			x		
Community Dialogue					
Pronunciation Aids			x		
Content Creation					
Public Notes					
Location Based Services					
Community Tracking					

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Affordance	Bible +1	Quran Explorer	Ayah-Quran App	Glo Bible	The Bible Memory App
Audio Listening	x	x	x	x	x
Multiple Versions/Translations	x	x	x	x	x
Search Tools	x	x	x	x	x
Bookmarking	x	x	x	x	
App Navigation Ease or Beauty	x	x	x	x	
Sharing Ability	x		x		x
Private Notes	x		x	x	
Highlights	x			x	
Customization	x	x			x
Commentaries					
Convenience/Portability	x				x
Authority/Official Content		x	x	x	
Notifications					x
Reading Plans	x			x	
Deeper Study Features					
Night Reading			x		
Pictures/Maps				x	
Personal Tracking			x		x
Lifestyle (prayers, food, meeting)					
Videos				x	
Music/Radio					
Performance Feedback					x
Memorization Aids					x
Community Dialogue					
Pronunciation Aids		x			
Content Creation					
Public Notes					
Location Based Services					
Community Tracking					x

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Affordance	Quran Al Kareem	Verse-a-day	Bible from eBible	alQuran	Touch Bible
Audio Listening	x		x	x	x
Multiple Versions/Translations	x	x	x	x	x
Search Tools	x		x	x	x
Bookmarking	x	x		x	x
App Navigation Ease or Beauty	x		x	x	x
Sharing Ability		x			x
Private Notes	x		x		x
Highlights			x		x
Customization					x
Commentaries		x	x	x	x
Convenience/Portability					x
Authority/Official Content	x				
Notifications		x			
Reading Plans			x		x
Deeper Study Features					
Night Reading					x
Pictures/Maps					x
Personal Tracking					
Lifestyle (prayers, food, meeting)					
Videos					
Music/Radio					
Performance Feedback					
Memorization Aids					
Community Dialogue					
Pronunciation Aids					
Content Creation					
Public Notes					
Location Based Services					
Community Tracking					

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Affordance	Light Bible	Quran Tafsir	Bible for Catholics	KJV Bible-Audio	NIV Bible
Audio Listening	x	x		x	x
Multiple Versions/Translations	x	x	x		x
Search Tools	x			x	x
Bookmarking	x			x	x
App Navigation Ease or Beauty	x	x		x	x
Sharing Ability	x			x	x
Private Notes	x			x	x
Highlights	x			x	x
Customization	x			x	x
Commentaries					
Convenience/Portability	x			x	x
Authority/Official Content	x		x		
Notifications	x			x	
Reading Plans	x				
Deeper Study Features	x				x
Night Reading				x	x
Pictures/Maps	x			x	
Personal Tracking	x			x	
Lifestyle (prayers, food, meeting)	x	x			
Videos					
Music/Radio					
Performance Feedback	x				
Memorization Aids					
Community Dialogue	x				
Pronunciation Aids					
Content Creation					
Public Notes					x
Location Based Services					
Community Tracking					

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Affordance	Bible for Women and Daily Study	Read Scripture	Holy Bible King James	NLT Bible	King James Bible with Audio
Audio Listening	x		x	x	x
Multiple Versions/Translations			x		
Search Tools	x		x	x	x
Bookmarking	x		x	x	x
App Navigation Ease or Beauty	x	x	x		
Sharing Ability			x	x	x
Private Notes	x		x	x	x
Highlights			x	x	
Customization	x		x	x	x
Commentaries			x		
Convenience/Portability			x		
Authority/Official Content					x
Notifications	x				
Reading Plans	x	x			
Deeper Study Features		x	x		
Night Reading	x		x	x	x
Pictures/Maps					
Personal Tracking					
Lifestyle (prayers, food, meeting)					
Videos		x			
Music/Radio					
Performance Feedback					
Memorization Aids					
Community Dialogue		x			
Pronunciation Aids					
Content Creation			x		
Public Notes			x		
Location Based Services					
Community Tracking					

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Affordance	Tecarta Bible	KJV Bible Offline	Catholic Bible	The Book of Mormon	Amplified Bible with Audio
Audio Listening		x		x	x
Multiple Versions/Translations	x			x	
Search Tools	x	x		x	x
Bookmarking	x	x			x
App Navigation Ease or Beauty	x	x	x	x	
Sharing Ability	x	x	x		x
Private Notes	x	x			x
Highlights	x	x	x		x
Customization	x				x
Commentaries	x				
Convenience/Portability	x	x	x		
Authority/Official Content	x		x		
Notifications	x	x	x		
Reading Plans	x				
Deeper Study Features	x	x			
Night Reading	x				x
Pictures/Maps	x				
Personal Tracking		x	x		
Lifestyle (prayers, food, meeting)		x			
Videos					
Music/Radio					
Performance Feedback					
Memorization Aids		x			
Community Dialogue		x			
Pronunciation Aids					
Content Creation		x			
Public Notes					
Location Based Services					
Community Tracking					

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Affordance	The Holy Quran	HolyBible KJV	The Holy Bible FREE	Bible KJV	Holy Quran with English
Audio Listening	x			x	x
Multiple Versions/Translations	x			x	
Search Tools	x	x		x	
Bookmarking	x			x	x
App Navigation Ease or Beauty	x	x	x	x	
Sharing Ability	x			x	
Private Notes	x			x	
Highlights		x		x	
Customization	x			x	
Commentaries	x			x	
Convenience/Portability	x				
Authority/Official Content	x				x
Notifications	x				
Reading Plans					
Deeper Study Features					
Night Reading	x			x	
Pictures/Maps				x	
Personal Tracking	x				
Lifestyle (prayers, food, meeting)	x				
Videos					
Music/Radio					
Performance Feedback	x				
Memorization Aids					
Community Dialogue					
Pronunciation Aids					
Content Creation					
Public Notes					
Location Based Services					
Community Tracking					

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Affordance	The Scriptures	Daily Bible Study	Holy Bible Mobile	Bible-Catholic Study	Daily Bible App
Audio Listening				x	
Multiple Versions/Translations			x		
Search Tools	x		x		
Bookmarking					x
App Navigation Ease or Beauty					x
Sharing Ability					x
Private Notes					
Highlights	x				
Customization					
Commentaries				x	x
Convenience/Portability			x		
Authority/Official Content					
Notifications			x		
Reading Plans					
Deeper Study Features		x			
Night Reading					
Pictures/Maps					
Personal Tracking					
Lifestyle (prayers, food, meeting)		x			x
Videos					
Music/Radio			x		
Performance Feedback					x
Memorization Aids					
Community Dialogue					
Pronunciation Aids					
Content Creation					
Public Notes					
Location Based Services					
Community Tracking					

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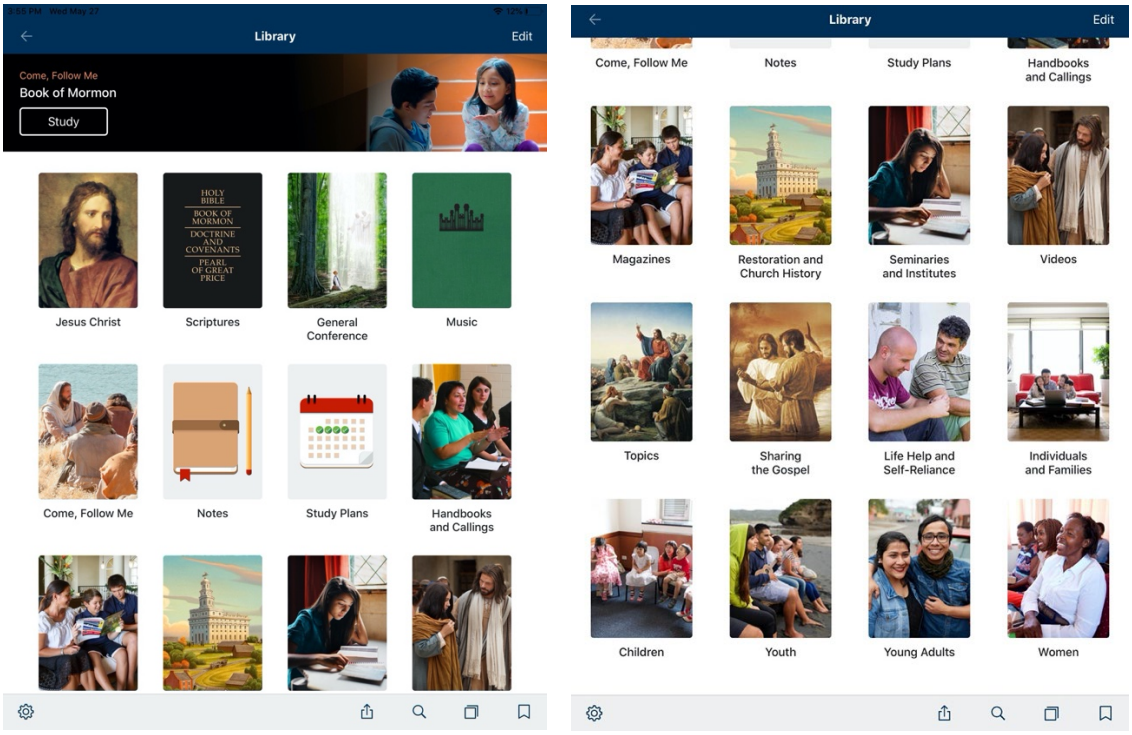
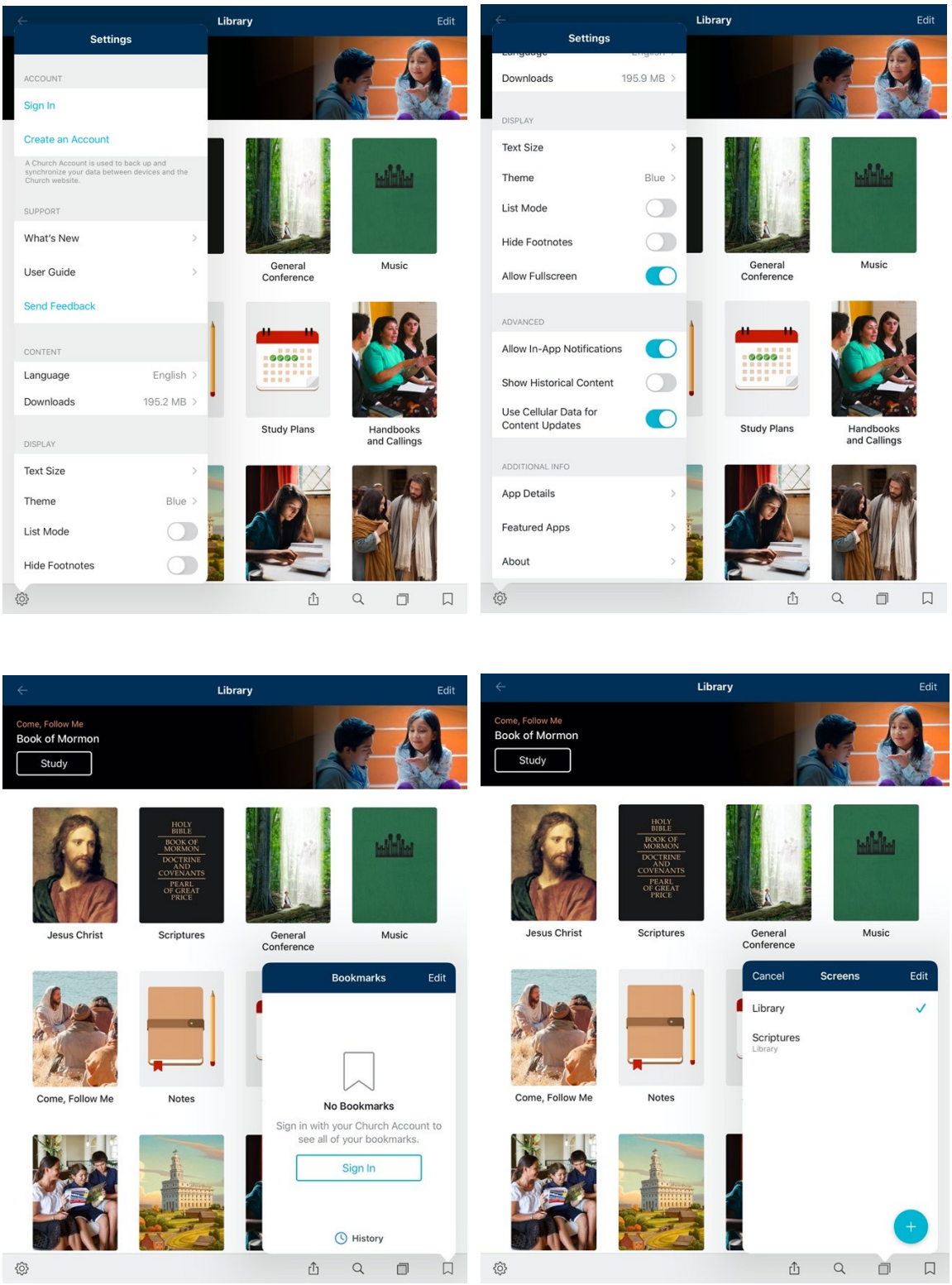
Affordance	Inspirational Bible Verse of the Day	WORD search Bible	Bible- The Word of Promise	Bible One Year	**Total Counts**
Audio Listening			x		45
Multiple Versions/Translations					44
Search Tools		x	x		43
Bookmarking	x	x	x		42
App Navigation Ease or Beauty	x	x			42
Sharing Ability	x	x	x		39
Private Notes		x	x		39
Highlights		x	x		34
Customization		x			33
Commentaries		x	x		26
Convenience/Portability		x			25
Authority/Official Content			x		24
Notifications					23
Reading Plans			x	x	22
Deeper Study Features		x			19
Night Reading					18
Pictures/Maps			x		17
Personal Tracking				x	12
Lifestyle (prayers, food, meeting)	x				10
Videos					7
Music/Radio			x		6
Performance Feedback					6
Memorization Aids					5
Community Dialogue					5
Pronunciation Aids					3
Content Creation					3
Public Notes					3
Location Based Services					2
Community Tracking					2

APPENDIX D

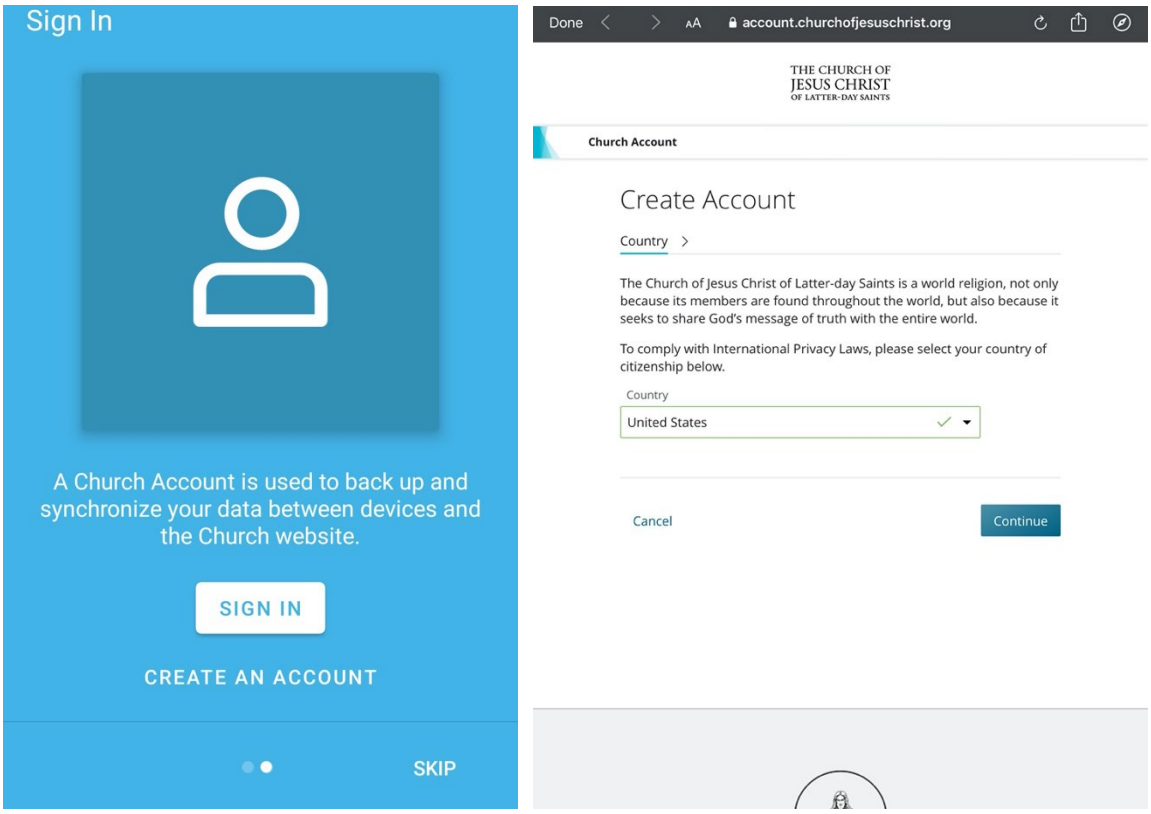
Screenshots from Walkthrough Procedure



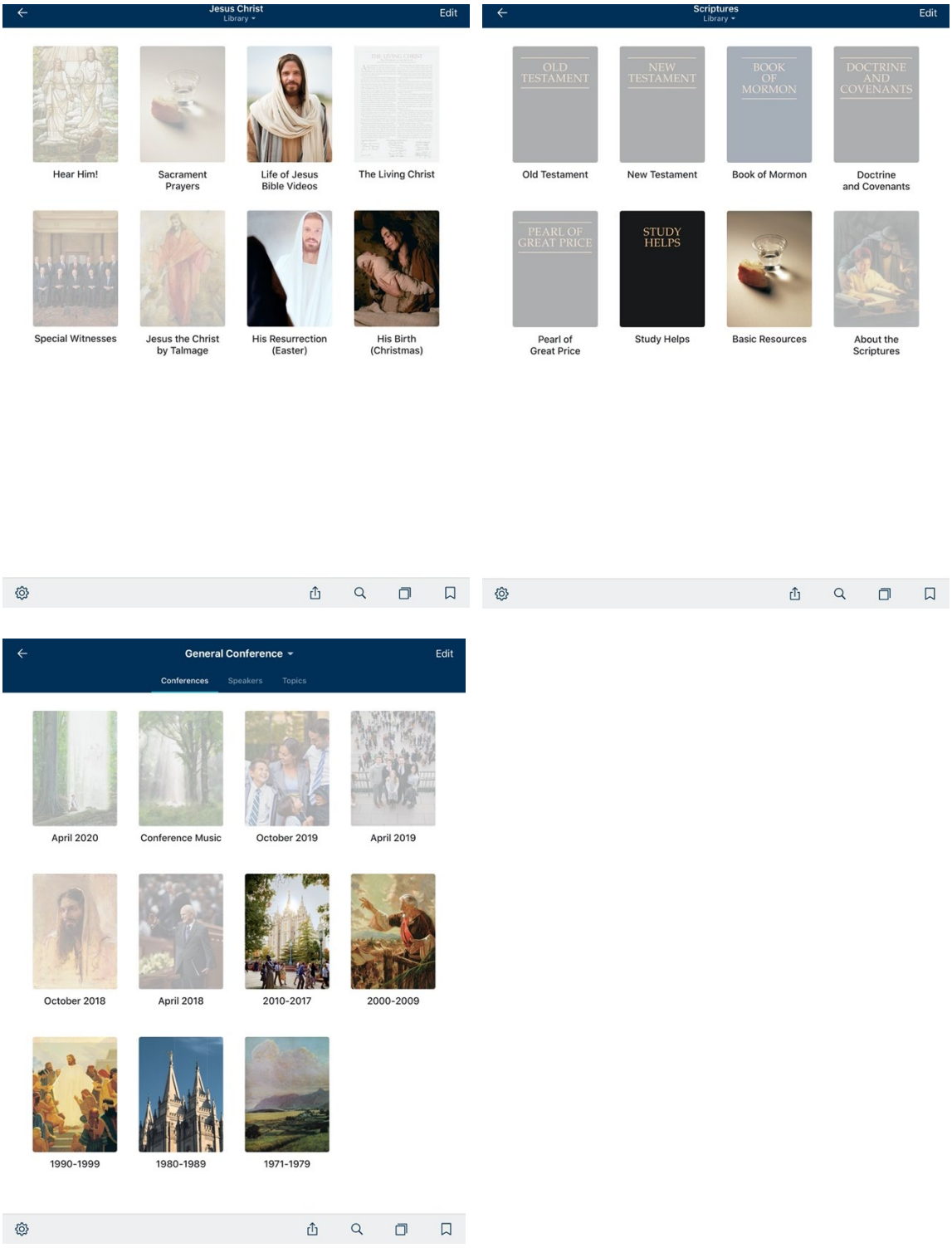
Main Home Page of Gospel Library.



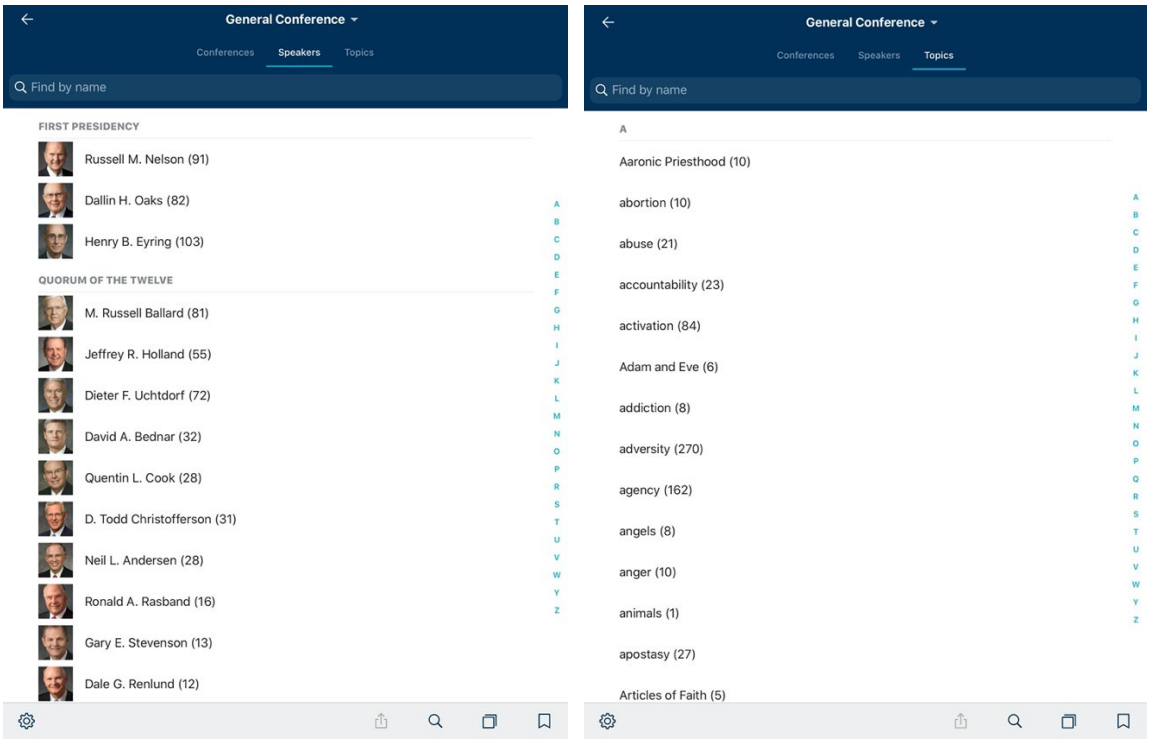
Settings and Features on Home Page.



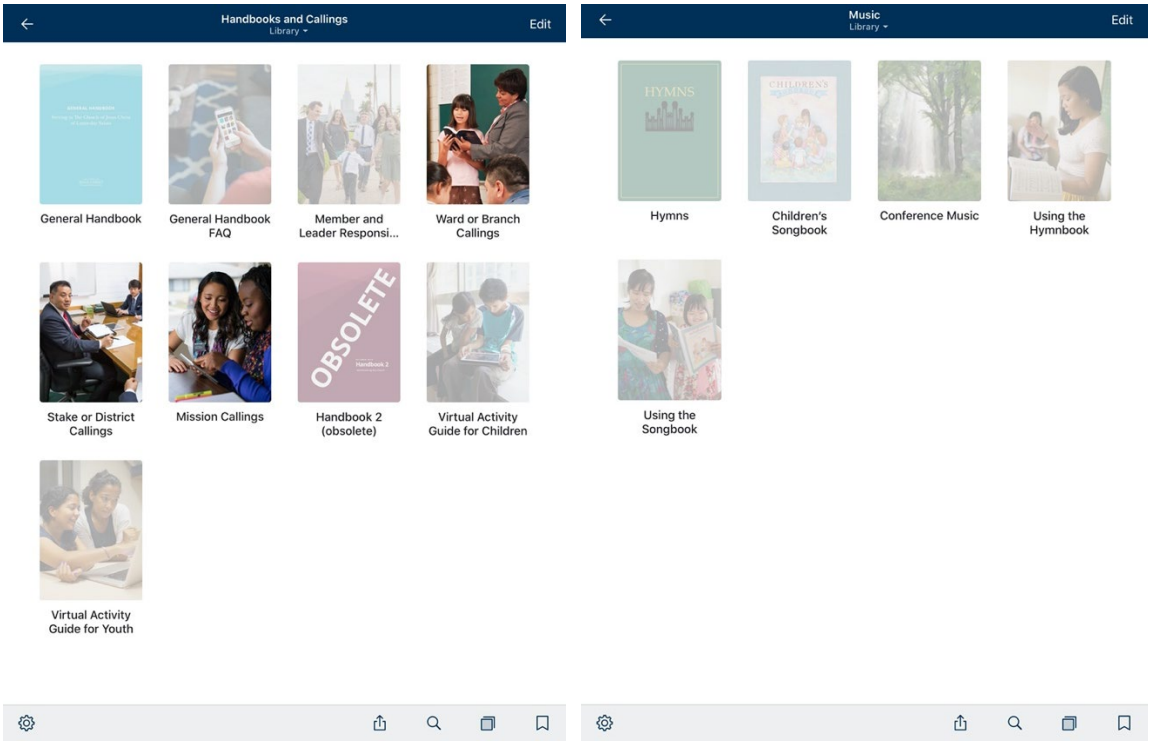
Account Creation Pages.



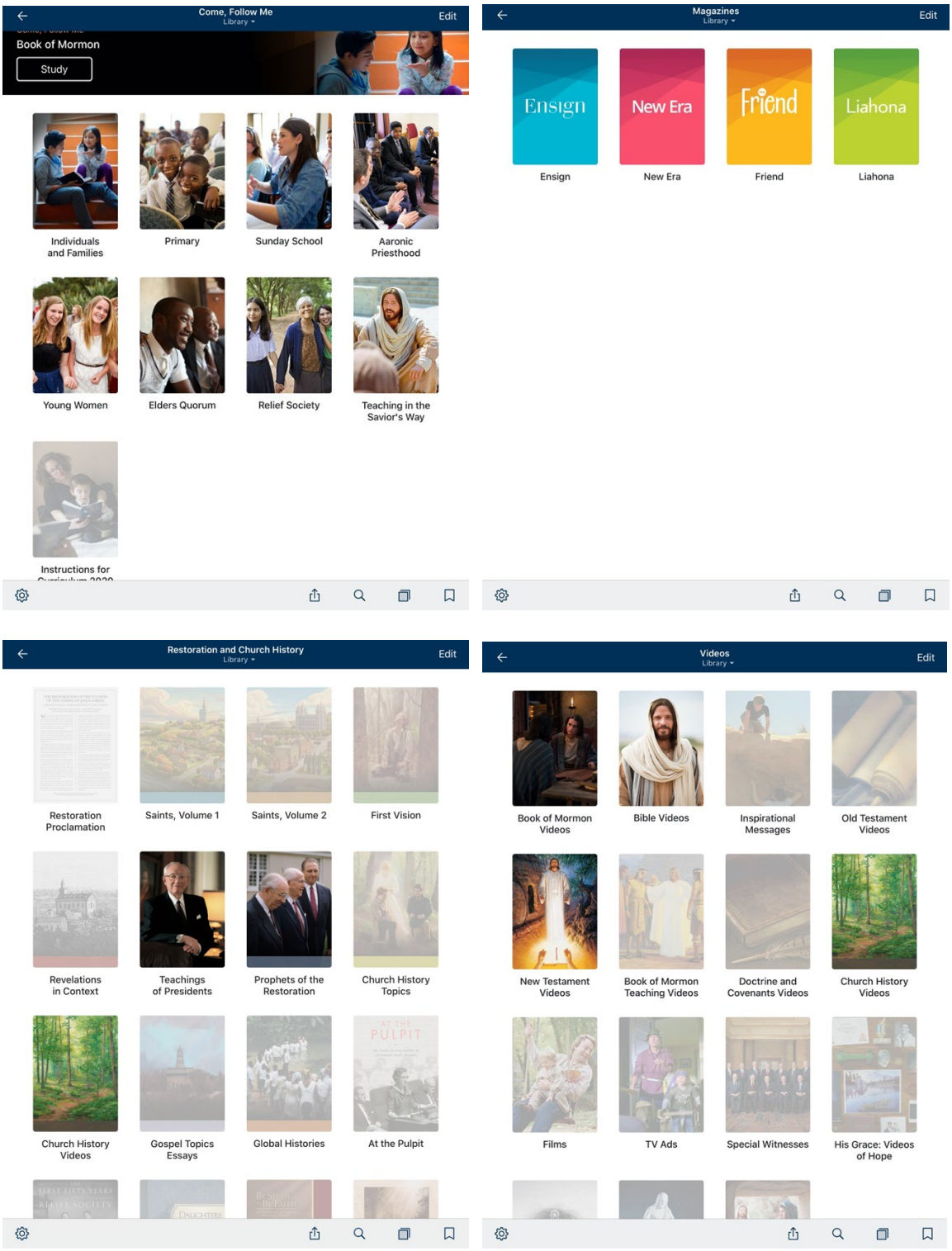
Main Content Submenus Including Scriptures, Sermons, and Commentary.



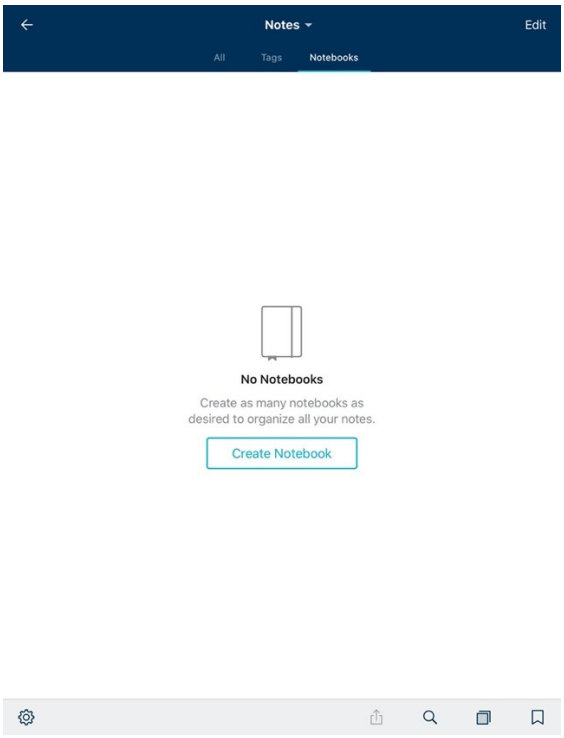
Content Submenus Including Topical Searches.

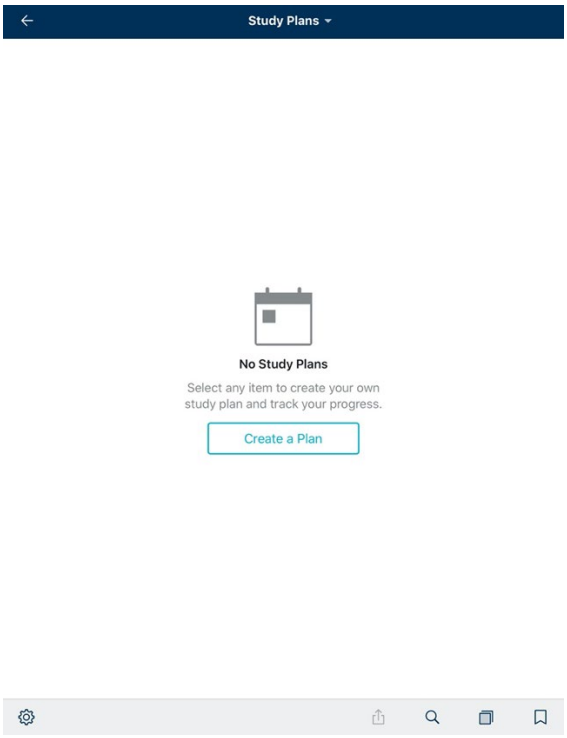


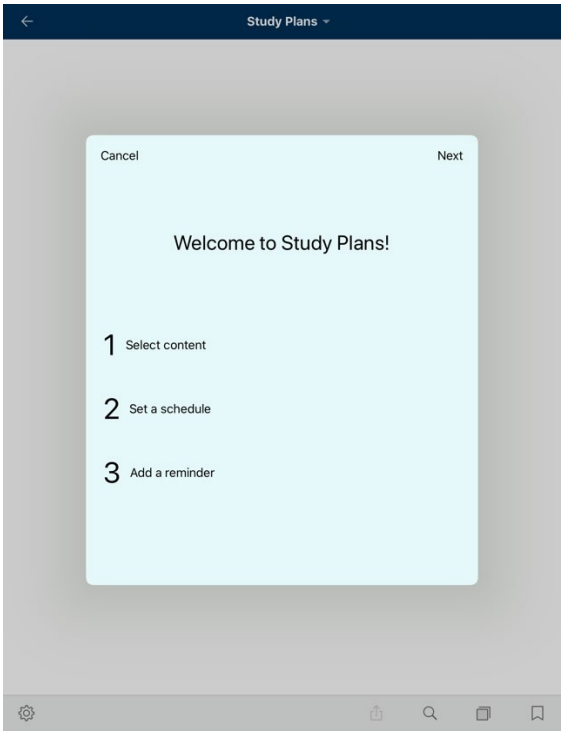
Additional Main Content Submenus Including Manuals and Hymns.



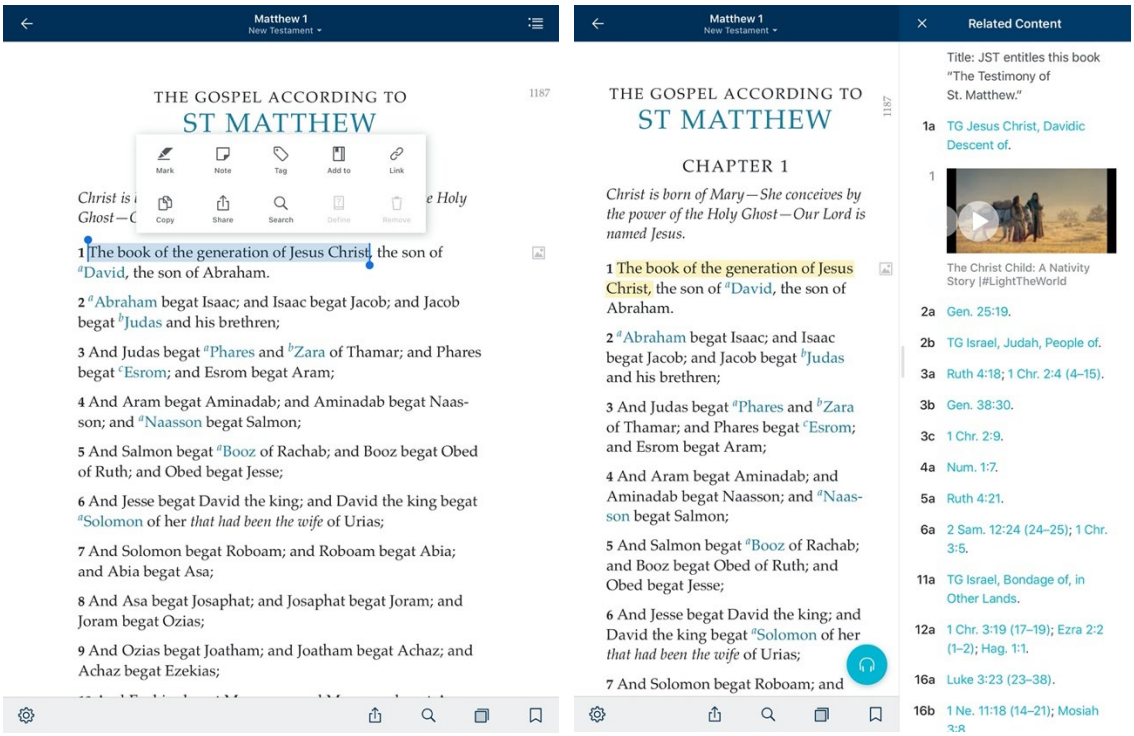
Additional Main Content Submenus Including Magazines, Articles, Books, and Videos.



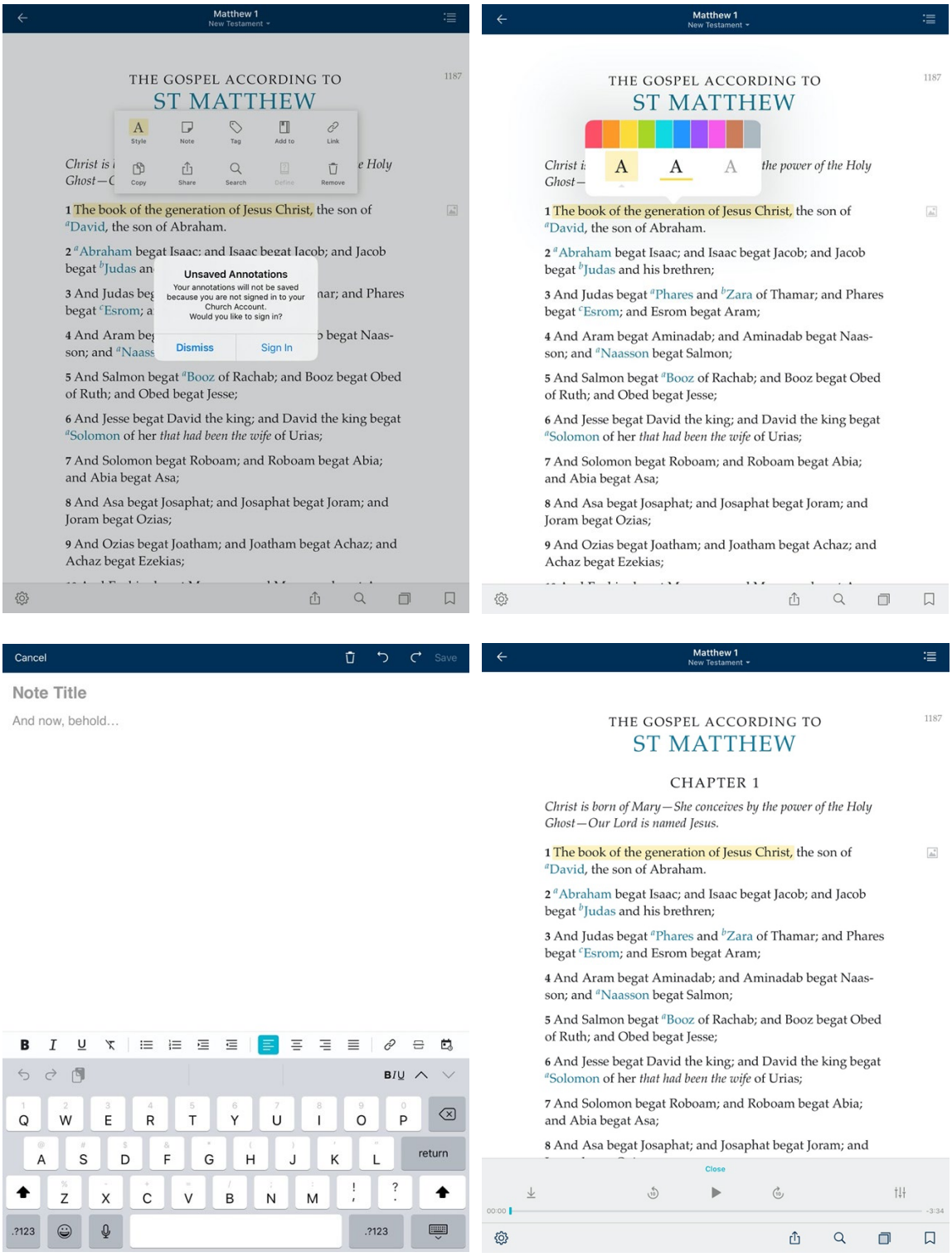




Main Content Submenu Affordances Including Notes and Study Plans.



Content Affordances Including Highlighting, Annotating, Tagging, Linking, Sharing, Searching, and Related Content such as Audio-Visual Elements.



Content Affordances Including Highlighting, Annotating, and Audio.

APPENDIX E

Selected Key Statements from Interviews

Design Priorities

Intentional Affordances

Product Manager

We as a church have a lot of things called, what others call study plans, in terms of gospel topics, in terms of Come Follow Me (guided scripture readings). … The tools have grown overtime and the content offerings have grown from just scriptures to also hymns, to also latest conference, also Come Follow Me, to also 3000 other things. … Search capabilities have grown, personalization things have grown, role-based capability of content has grown. … Bookmarking, highlighting, notetaking, linking, sharing.

User Experience Designer

Scheduler, related content, more stylization, customization within notes, grid navigation, quick link, a user guide. … It has multiple color themes including the dark theme, to work with your operating system. … A user can now search their notes or their personal UGC, meaning user generated content. … General Conference can now be sorted by speakers and topics.

Desired Affordances

Product Manager

It, overtime, will mature, plans to be custom, shareable, topical, other things besides just reading plans. … [Notifications have been] discussed and designed, and will eventually do. … Playlists for audio, like, it's either music or conference talks or any audio recordings. Adding images to notes, trimming videos, verse of the day, a better support system like a live chat feature or video screen sharing connecting people to one another for support. … Improving the search is one of my top functions or features I'd do. … I'd delete a large portion of the content that's in the app. … In essence they [users] just want ways to organize and personalize their stuff. … Streaks, badges, plans, I mean all kinds of stuff to entice and motivate and help people return and build daily habits. … It will become simplified to focus more on the study of the scriptures and words of living prophets. It will become more messaging based, like verse of the day, and promotional ads. It will become more social, it will have stronger tools, it will become better with the ecosystem of other things. I foresee that we will start licensing more and have it work with other church apps and non-church apps. I think media will take a bigger place rather than just text publications with some media. User support will be increased.

User Experience Designer

I think number one is improved search. … Audio experience, music section, personalization with machine learning, tab navigation with a home tab, share our screen with people nearby us, add your own content, multiple assets or even languages at the same time, quote or verse of the day, live chat with a support person, align better with iOS and Android icon sets, layered notations. … More customization in general, like a lot of our users just ask for–let me customize it, let me organize it, let me have only the stuff that I care about, and I don't care about all 90% of this stuff.

Guiding Design Values

Product Manager

[The purpose of Gospel Library is to] help Jesus Christ and his apostles provide their words to the world, or their messages, to the world, to all of God's children. Help users have revelatory experiences as they study and teach the Savior's restored gospel. And then help various church leaders, councils, and departments accomplish their purpose. … Originally just provide the scriptures, then provide all the content, and then overtime I've focused my long term vision statements to helping select groups, namely the Savior, apostles, and then the third one is to help other departments, and all along it has been to help users have revelatory experiences with studying and teaching the Savior's gospel.. … A lot of stakeholders ask for various things, a lot of general authorities (highest church leaders), including general officers, and the scriptures committee, like there's so many stakeholders. … The primary audience are active members 8 and older who have access to technology. … I believe in a product team approach, and I consider everyone to have access to inspiration and participate in the design process. So, while one guy gets paid to be a UX designer and draw functionality prototypes and things, I don't see design as only one person having it or having stewardship for it. … I look at analytics. I have stakeholders ask me for things. I meet with designers who look at things from a design perspective. I meet with developers who are always going to development conferences and know the space. I talk to people myself directly. I do trainings. There's all kinds of inputs, there's no lack of inputs. … I divide the app into two things, it's a content app, and it's got study tools.

User Experience Designer

So there's a whole huge unending backlog of things that people want. So, we review those and try to prioritize the backlog. … The first [priority] is helping people learn about [the] gospel, that's one of the three missions of the church. So, to me it's clear that that's our job. … [Our audience is] all God's children, but primarily I would say baptized members of the church. And this is where it gets tricky, is that it's old people, and it's also very young, and it's also people located all over the entire globe, including every person with disabilities. Maybe not people who aren't quite baptized yet, but definitely

everybody who's been baptized. … At least baptized members which narrows it down that much. We're certainly not intentionally alienating anyone, but if you look, our followers, the users of this app, it's like more than 99% baptized members. … My design priorities are for understanding the needs of the user. Secondly, understanding the goals and desires of stakeholders and those can be very different things. Thirdly understanding the iOS and Android platform rules and regulations and capabilities. … I need to design a user interface that's intuitive and useful for our users. … I would definitely call [user feedback] primary, it's certainly not the only, and I will also say that we could do a much better job of being proactive and going out and understanding and gaining empathy for our users globally and really digging into understanding them more. … If there are features that really are appropriate [in Gospel Library], I think we can get the scope in place, or get the right resources. … [Some guiding influence comes from an] operating system saying "you really should do this". … But like it's also driven by the user. … Grid navigation is more like–it just makes sense. I'm trying to think what the actual driving force would be. I'm just gonna say design, UX design, design principles. … It almost seems obvious, like things that the users want, things that for whatever reason, they just seem like they're bad right now, they could be better. We get a lot of feedback on some of these things, some were just industry standard, or my own opinion of the app.

Design Limitations

Limited Affordances

Product Manager

It's a church position that we unify on the King James version of the English scriptures. So, it's church policy decision not me not wanting to, or not getting to add it. … YouVersion Holy Bible has every version they'd ever want, why do we have to provide all that, plus we don't have rights to any of it. … We know the popularity of that feature (study plans) on YouVersion and other places. We have a concept of study plans that allows someone to track their reading, but it's not topical. … Some people say I should put all videos of the church in. I think most of videos of the church aren't that helpful or usable. … I've chosen to stay selective in the amount of videos that are added. They're old, outdated, low quality, distracting, they're not words of living prophets, they're not based on the scriptures, some are created for social purposes only. … There's a lot of people who want various settings, auto scroll with text, there's just a lot of like little tiny nuance requests we get that I fight adding too much complexity to the app.

User Experience Designer

Any features that appropriately live in another app [do not belong in Gospel Library].

Guiding Design Constraints

Product Manager

I welcome and have been asked to have oversight, and because of the popularity of the app I get it from different departments who have strategies. A lot of people tell me what I have to do or what bounds I have to play in. … I respond by saying "how many people have asked for that same thing?" So, I mean with three million users you can imagine there's a lot of opinions, and I only make adjustments when I hear trends or themes or recurring request. … There's a question, strategically should Gospel Library be this one app that does everything, or should there be these separate apps that do things? Decisions need to be made whether Gospel Library should be a one stop app for all things or remain more focused as a reader app. … [The decision] will be made between myself with various staff and executive management across my department and then another church department that has digital channel strategy stewardship. … [Constraints come from] time, development resources, limited development resources, which equals budget too. … We just don't have the rights to [some excluded content], nor do I think it's helpful to go back more than '71 to get old magazines. … But the biggest obstacle is just having budget and resources to do it.

User Experience Designer

[Our manager] comes to us and says this is what so and so wants, and we say ok, so we need to understand how this need fits in with the needs of our base, like our bigger majority. … I have to get [the team's] buy in I have to get the product managers buy in, like I said, answers the upper management's requests, including ecclesiastical leaders. And then, I think as far as the user goes, I think I need to respect the basic user expectations for usage. … So, it's a balancing and in some ways, I think the designer kind of does that balancing. Like the product manager balancing what the stakeholders want and what the developers want and what the user wants, and I'm trying to speak all their languages and bring them all along and communicate to them all. … I've never actually heard any feedback from our users that they're requesting other [English Bible] versions. … The church's opinion on the value that they put in the King James version compared to all the other versions at this point [influences the lack of other translations]. … If our users were asking for it, if a lot of them were asking for it then we might push upper management to ask–is this something we should consider. So, at this point I think it's just not, it's not a need. I think I would call it an intentional design choice. … An intentional design choice based on lack of user interest. And that kind of thing seems like it would come more from the organization than the users. And I've not heard anybody talk about that, well I've heard designers talk a lot about that because YouVersion does a great job with study plans. … Super frustrating when they do want something, like YouVersion is a good example, like a stakeholder comes and says, "hey we need to have this thing", and we're going "nobody's ever asked for that". So, let's not build in

something that's going to be a huge technical debt or load or effort or cost when we don't really have the need at this time now. … Does that really belong in this app? Or allowing that to be a third-party app, 'cause there's a lot of third-party apps that do this well already. Do we want to compete against that? Is there another app or is this the appropriate app? So those are the questions that we need to think through without just saying "yeah let's just do it 'cause they're asking for it in this app", 'cause they don't understand the bigger app strategy for the church. … But they have a higher oversight app strategy from CCD (communication department of the church), and CCD would determine if our manager's desires are appropriate. … I think giving ourselves time to do innovative stuff, prioritizing innovative space rather than being slaves to the backlog.

VITAE

NEIL CARPENTER

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  Assignments:
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  Stansbury Park, UT- (May 2015 – May 2019)
  Tooele, UT- (May 2011 – May 2015)
  Logan, UT- (May 2010 – May 2011)

- Direct Support Specialist—Rise Inc., Logan, UT
  (May 2008 – May 2010)
  Supply personalized support for a wide range of individuals with special needs or disabilities including managing medications, career plans, life goals, and other interests for clients.

- Staff Member—Top Flight Academy, Mount Pleasant, UT
  (Feb. 2007 – May 2008)
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PUBLICATIONS AND PRESENTATIONS:

Jones, C.D., **Carpenter, N.**, & Parker, N. (2020, November). *Connecting the Construction-Integration Model and Comprehension Instruction.* Presentation at the Association of Literacy Educators and Researchers Conference, Santa Fe, NM (Conference cancelled due to COVID).

Jones, C.D., **Carpenter, N.**, & Breitenstein, J. (2020, August). *Literacy Character Analysis to Promote Social and Emotional Competency Development.* Presentation at the JSD Special Education Summer Conference, Jordan, UT.

Mohr, K. A., Ding, G., Strong, A., Branum, L., Watson, N., Priestley, K. L., Juth, S., **Carpenter, N.**, Lundstrom, K. (2017). Reading the past to inform the Future: 25 years of the Reading Teacher. *The Reading Teacher, 71*(3), 251-264. doi:10.1002/trtr.1636