

Limits of the “digital library” metaphor of Bible software

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Bible Gateway
May 2, 2015

Premises

1. Current Bible software is optimized for continuous reading, which doesn't match how a sizable fraction of people approach the Bible.
2. People do lots of other things with the Bible than study it, and the digital library metaphor doesn't accommodate these uses.

People = American evangelicals.

Ways people read religious texts

1. Devotional
2. Educational
3. Therapeutic
4. Appropriative

Ronald, "More than 'Alone with the Bible'"

Emily Ronald. Devotional: a "means of prayer." Only Bible or with devotional aids like Our Daily Bread. Educational: to learn something new. Often with study resources. Therapeutic is not seeking the new but "comfort and consolation;" one scholar says Christian romance novels fill this need. Appropriative: after reading, similar to application, where you incorporate the ideas in your life.

Two approaches to physical books

Annotators

“Carnal lovers.”

Visible use is “a sign not of disrespect but of intimacy.”

Bibliophiles

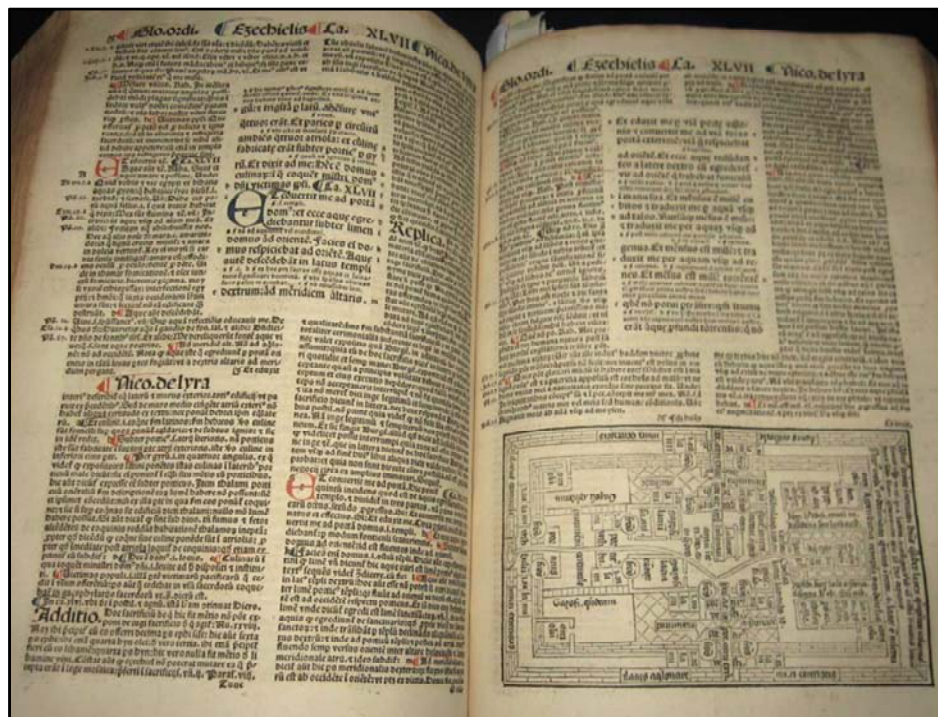
“Courtly lovers.”

“Conserve forever the state of perfect chastity in which it had left the bookseller.”

Anne Fadiman via Jackson, *Marginalia*

Historically, annotators were more popular. With the rise of lending libraries in the 1700s and public education in the 1800s, “library” books has come to mean “books you don’t write in”

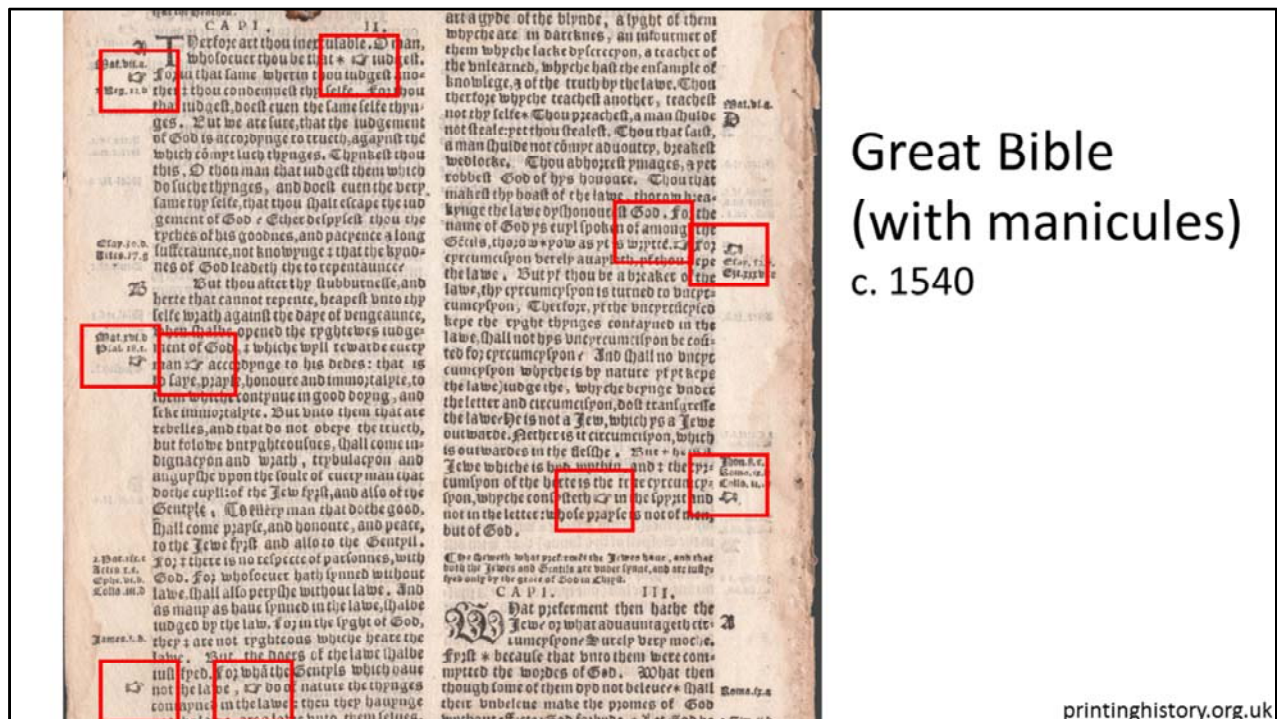
Print annotations in early Bibles



Glossa Ordinaria 1498

collaborations.com

The standard commentary for centuries helped inspire Tyndale's translation in reaction. Erasmus called it a hodgepodge "stuck or patched together;" we might call it a scrapbook.



Intended to show where to leave interpretations to the church, it drew attention to the passages in question.

Exodus 1:17, 19 (Geneva Bible)

Notwithstanding the midwives feared God, and did not as the King of Egypt commanded them, but preserved alive the men children.

And the midwives answered Pharaoh, Because the Hebrew *women are not as the women of Egypt: for they are lively, and are delivered ere the midwives come at them.

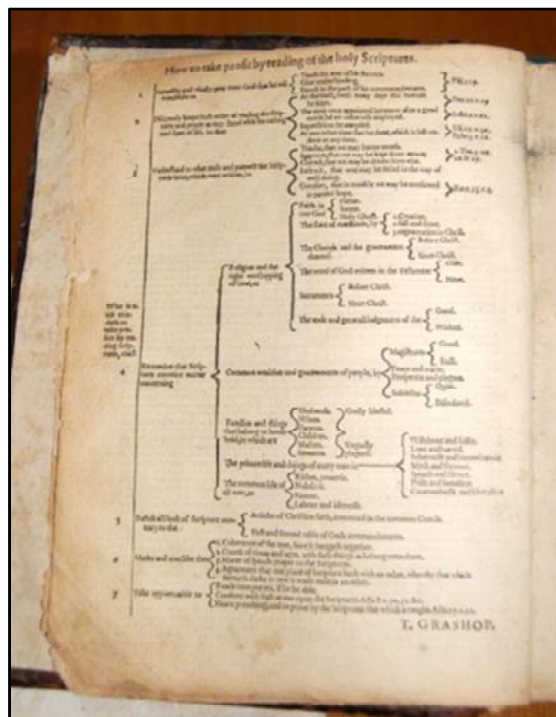
* Their disobedience herein was lawful, but their dissembling evil.

King James is not a fan of this footnote.

Study aids printed in Early Modern Bibles

- Advice on how to study the Bible
- Summaries
- Headers
- Marginal notes and cross-references
- Maps and diagrams
- Technical info (genealogies)
- Chronology
- Tables (eg, of weights)

Basically the same as modern study Bibles.



“How to take profit
by reading of the
holy Scriptures”
T. Grashop
c. 1578

Added to most Geneva Bibles published in the late 1500s.

How to take profit by reading of the holy Scriptures. (T. Grashop)

Whosoever minds to take profit by reading Scriptures must:

c. 1578

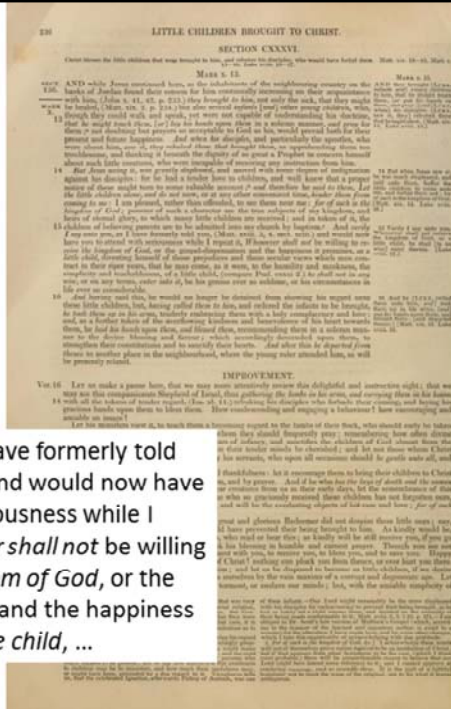
1	Earnestly and usually pray unto God that he will vouchsafe to	Teach the way of his statutes. Give understanding. Direct in the path of his commandments.	Psalm 119
		At the least twice every day this exercise be kept.	Deut. 11:19
2	Diligently keep such order of reading the Scriptures and prayer as may stand with his calling and state of life, so that	The time once appointed hereunto after a good entry, be no otherwise employed. Superstition be avoided. At one other time that be done, which is left undone at any time.	Luke 9:62 Isa. 29:36 Eph. 5:16
		Teach that we may learn truth	

Isa 29:36.

Summary

Pithy
paraphrase +
expanded
translation

*I say unto you, as I have formerly told
you (Matt. 18:3, 4) and would now have
you attend with seriousness while I
repeat it, Whosoever shall not be willing
to receive the kingdom of God, or the
gospel-dispensation and the happiness
it promises, as a little child, ...*



KJV

Philip Doddridge
Family Expositor
1739-1756

Application notes

“Critical” notes

archive.org

Designed for rigorous family use to overcome perceived failings of other family study aids.
Has three translations. Available on Faithlife's prepub for \$30.

Personal annotations

Physical book annotation types

Characteristics	Within-text	Marginal or blank space
Telegraphic	Underlining, highlighting, circles and boxes around words and phrases	Brackets, angle brackets, braces, asterisks, stars, circles and boxes around whole pages, arrows and similar to connect within-text markings to other marginal markings
Explicit	Brief notes written between lines, especially translations of words in foreign language texts	Short phrases in margin, extended notes in margin, extend notes on blank pages in the book

Adapted from Marshall, "Annotation: from Paper Books to the Digital Library"

No pointers to material outside the book.

Desirable properties of digital annotations

1. In-place annotation.
2. Non-interpretive markings.
3. Fluidity of form.
4. Informal codings.
5. Smooth transitions between public and private.
6. Integration with reading as activity. Minimize distractions.
7. Multiple workspaces.
8. Memory.

Adapted from Marshall, Hillesund, and Tashman and Edwards

1. Writing on, but distinguishable from the source. 2. Sometimes people just write in books. 3. Many different symbols, colors, etc. 4. People develop idiosyncratic systems. 6. As little interruption to the task of reading as possible. O'Hara notes that people reading physically interleave reading and annotating while digitally they leave annotation to the end. 7. Paper also adds spatial memory. In digital documents, people use pictures as anchors.. Ergonomics, multimodality (text + pictures), hypertext, multifunctionality make online reading hard.

“To imagine continuous reading as the norm is radically reactionary; it is to read a codex as if it was a scroll, from beginning to end.”

Peter Stallybrass

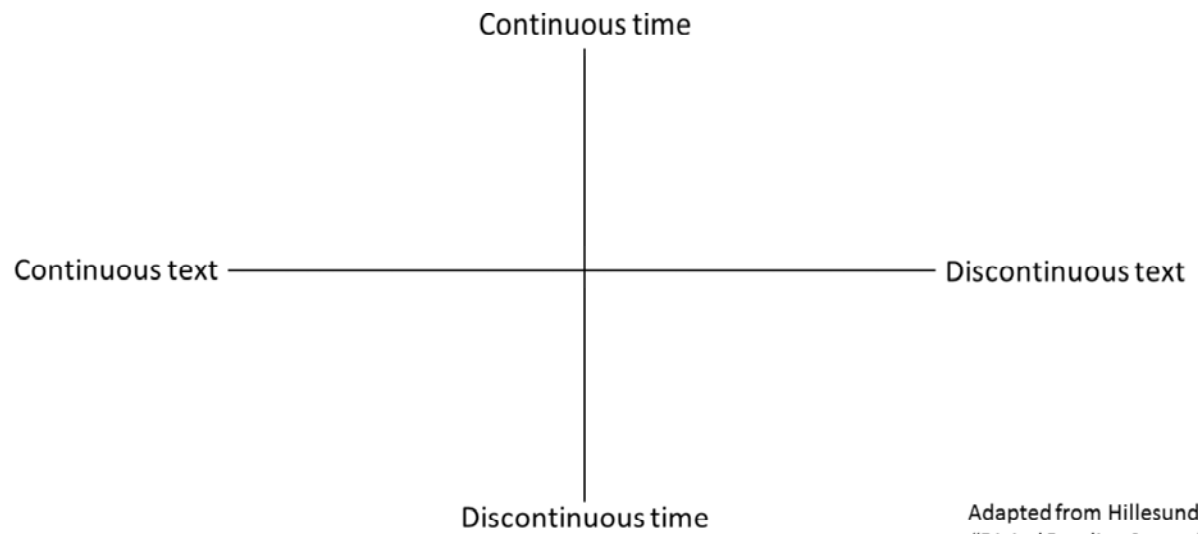
Wanting people to read continuously is historically reactionary. Only since the 1800s and the rise of the novel has sustained, continuous reading been the norm. “Continuity was provided above all by the liturgical year.”

The Holy Scriptures II (George Herbert, 1633)

This verse marks that, and both do make a motion
Unto a third, that ten leaves off doth lie:
Then as dispersed herbs do watch a potion,
These three make up some Christian's destiny.

Applying it as a potion to your life

Continuity and discontinuity in text and time



Continuity in users' Bible annotations

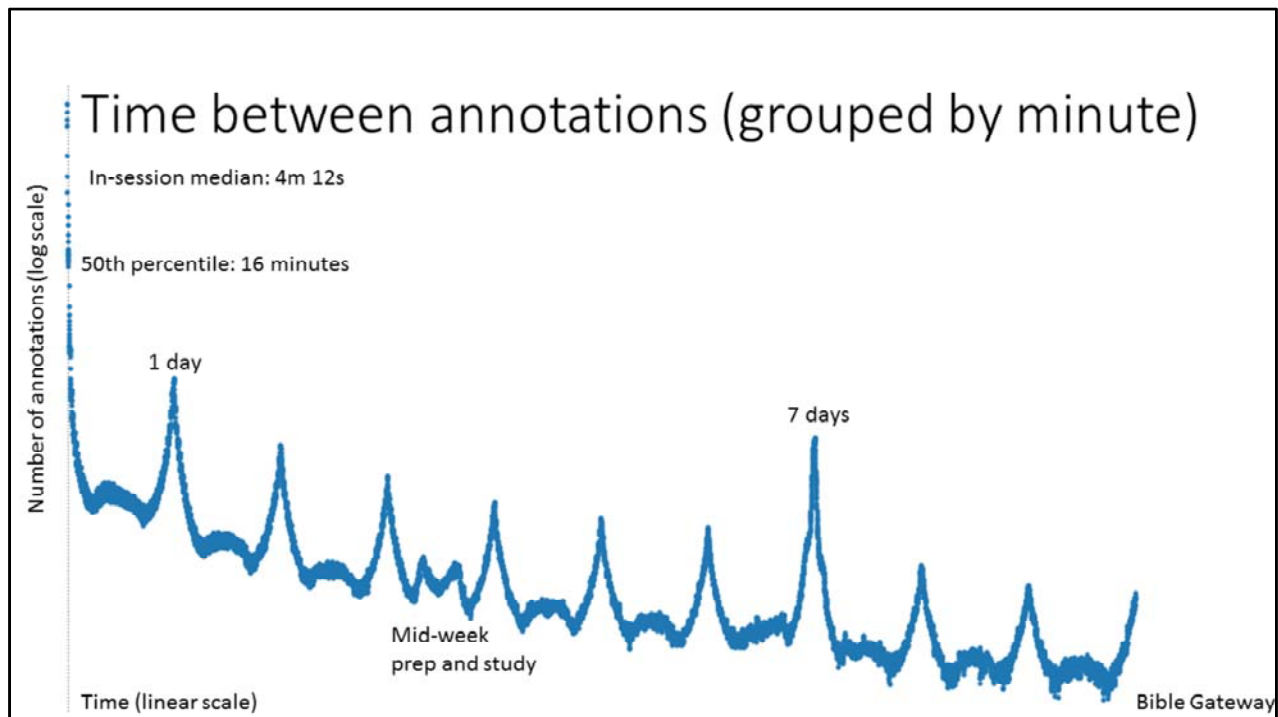
Often (50%+ sessions)				Sometimes (1-49% sessions)				
		Con time				Con time		
Con	81%		7%	Text	Con	19%	76%	
	0%		2%			20%		55%
		Dis time					Dis time	
		Dis					Dis	

Con = Continuous. Dis = Discontinuous.

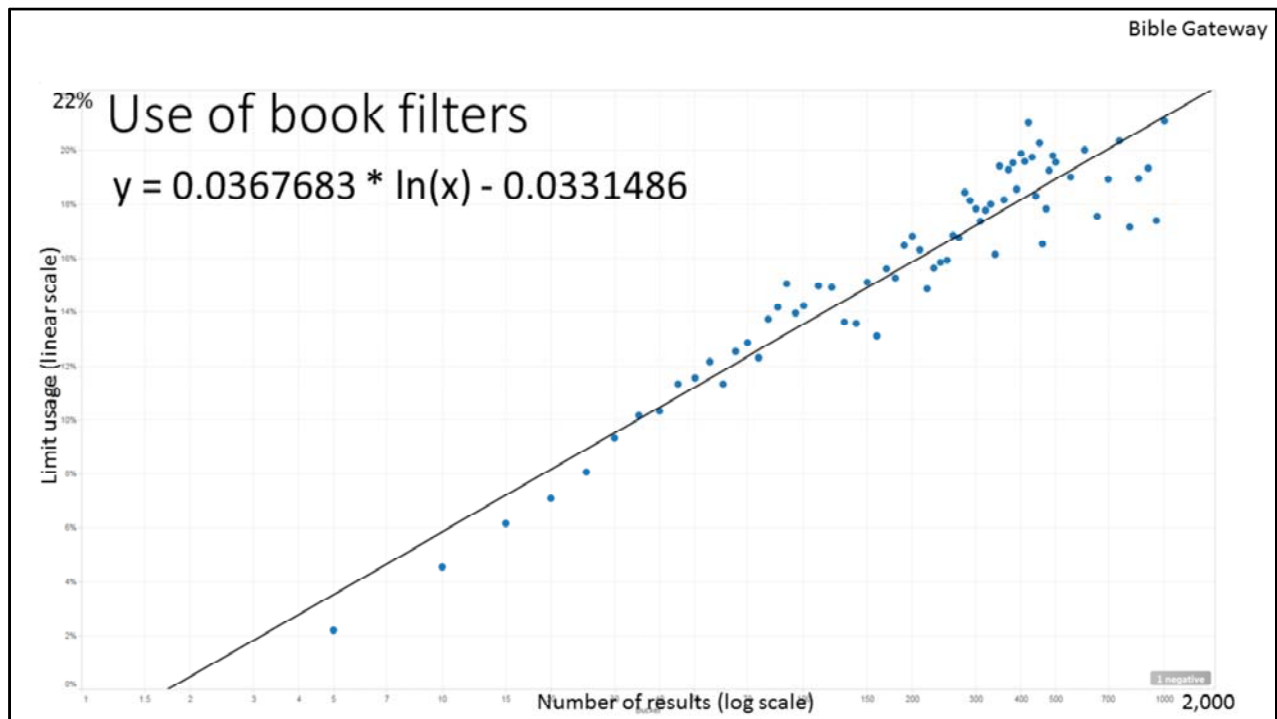
Session is defined as 60 minutes. Discontinuity is defined at 60-1,080 minutes (18h).

Bible Gateway

Continuous text means annotations within a single or consecutive chapters.



Median is 16 minutes. If you look only at annotations within an hour of each other, the median is 4 minutes 12 seconds. That's not necessarily a proxy for overall session length, but it may be a proxy for active engagement.



Common source of discontinuity is keyword search. This formula breaks down after 2,000 results as people change their search terms rather than use filters. Pattern holds independent of results displayed on a page (up to 500).

Same-session multiple annotations

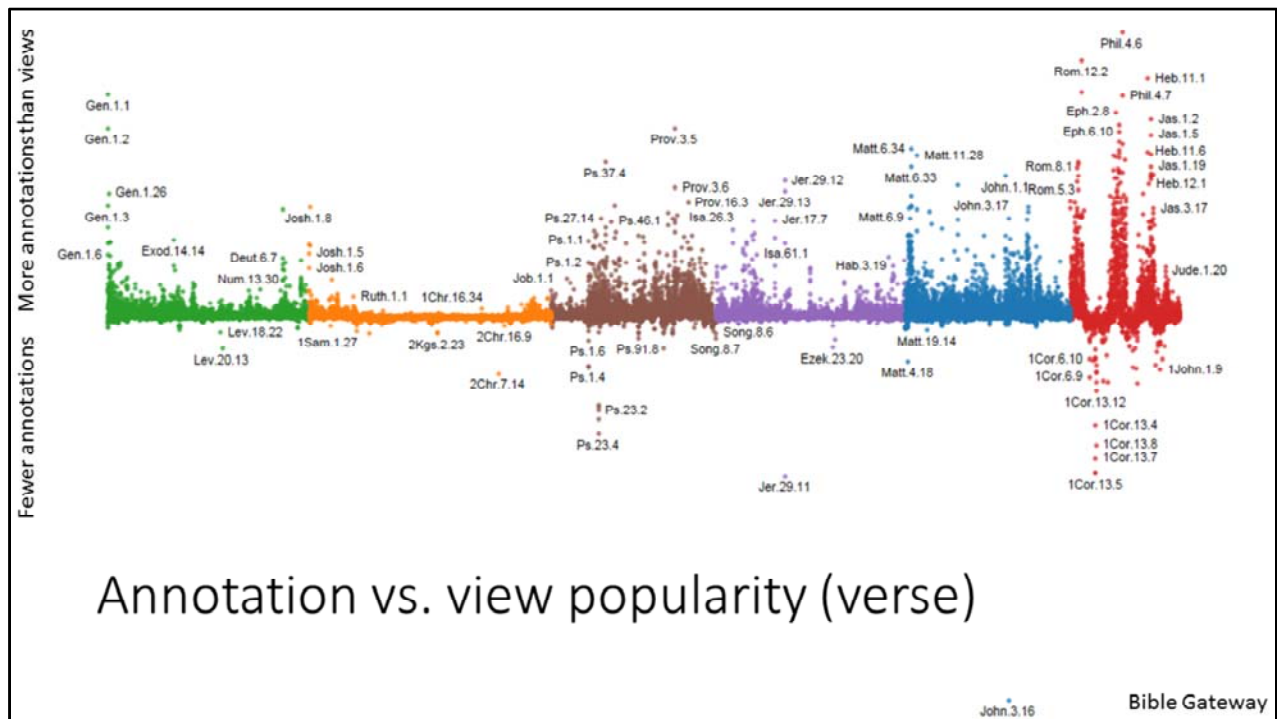
here's the likelihood you also have a...

		Highlight	Favorite	Note
If you have a...	Highlight	76%	77%	12%
	Favorite	42%	82%	14%
	Note	39%	78%	50%

... in the same session.

Bible Gateway

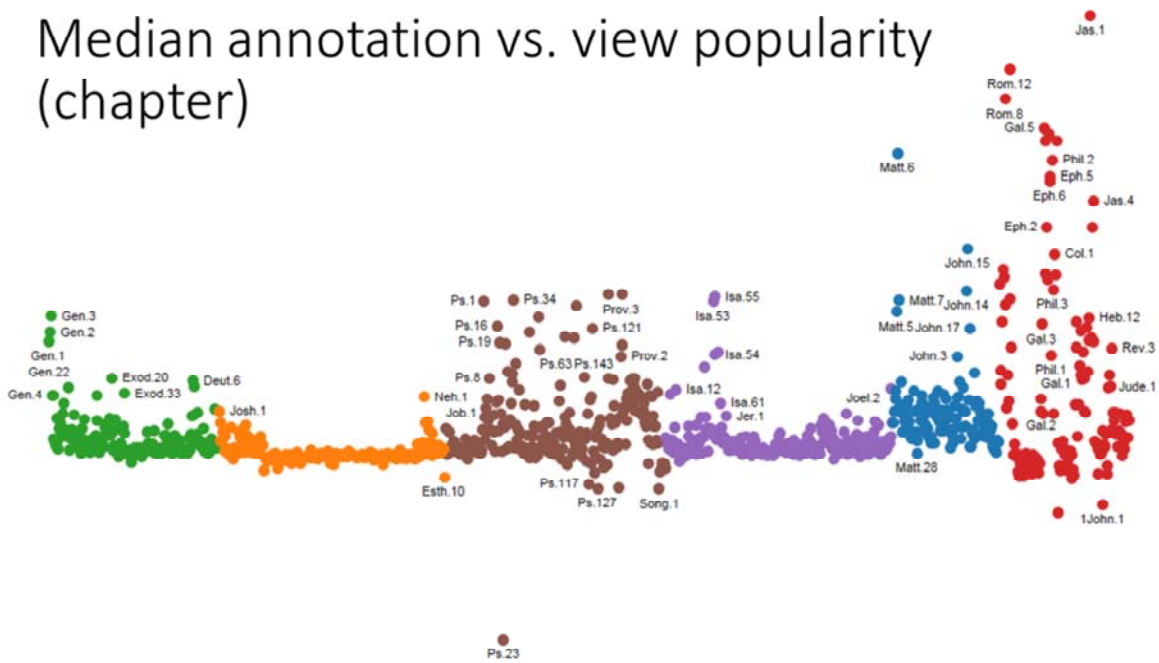
3 kinds of annotations. Highlights are the most-common annotation, then favorites, then notes. Having a note is far less likely than a highlight or a favorite. Because it's harder to write a note, both cognitively and physically (typing)?



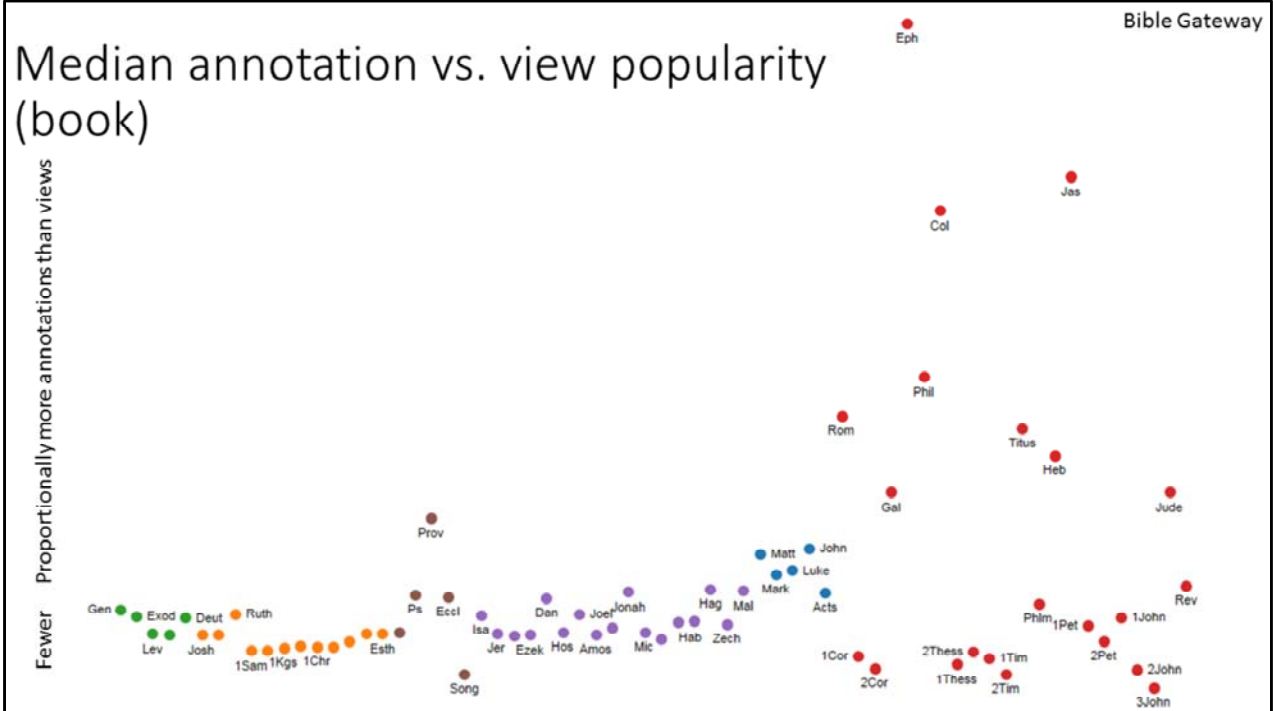
“Do not be anxious about anything.”

Median annotation vs. view popularity (chapter)

Proportionally more annotations than views
Fewer annotations

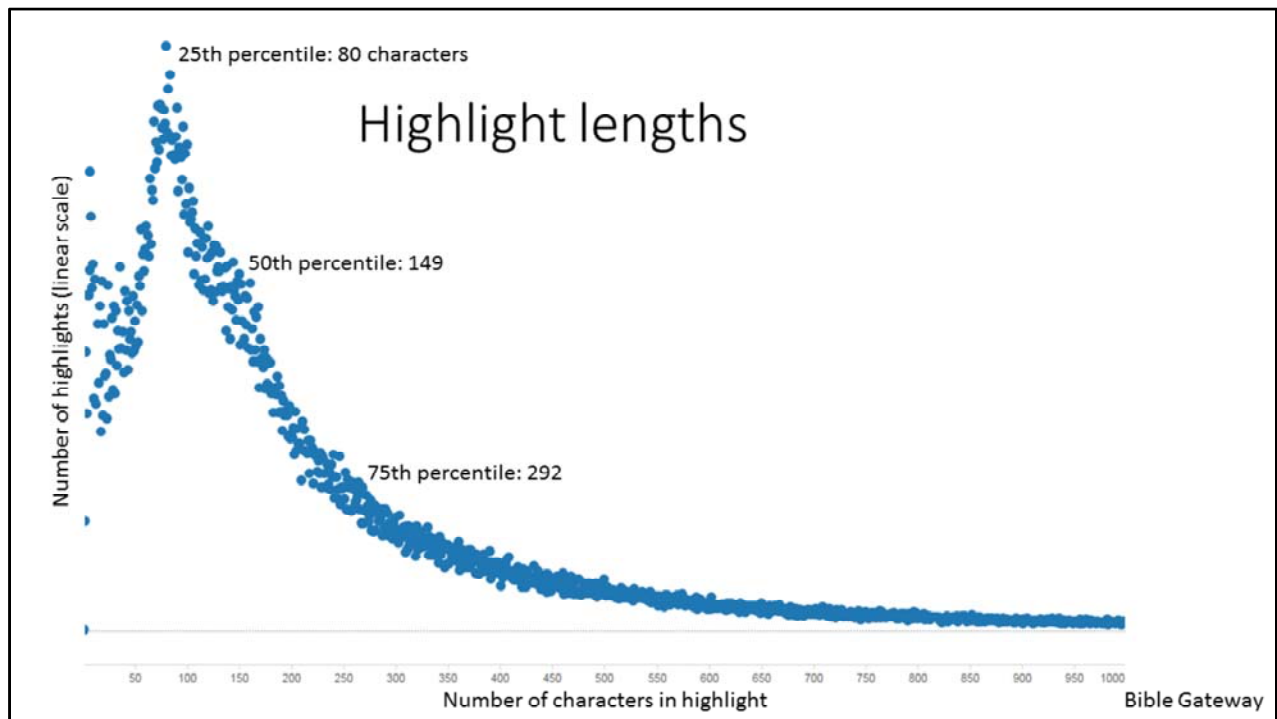


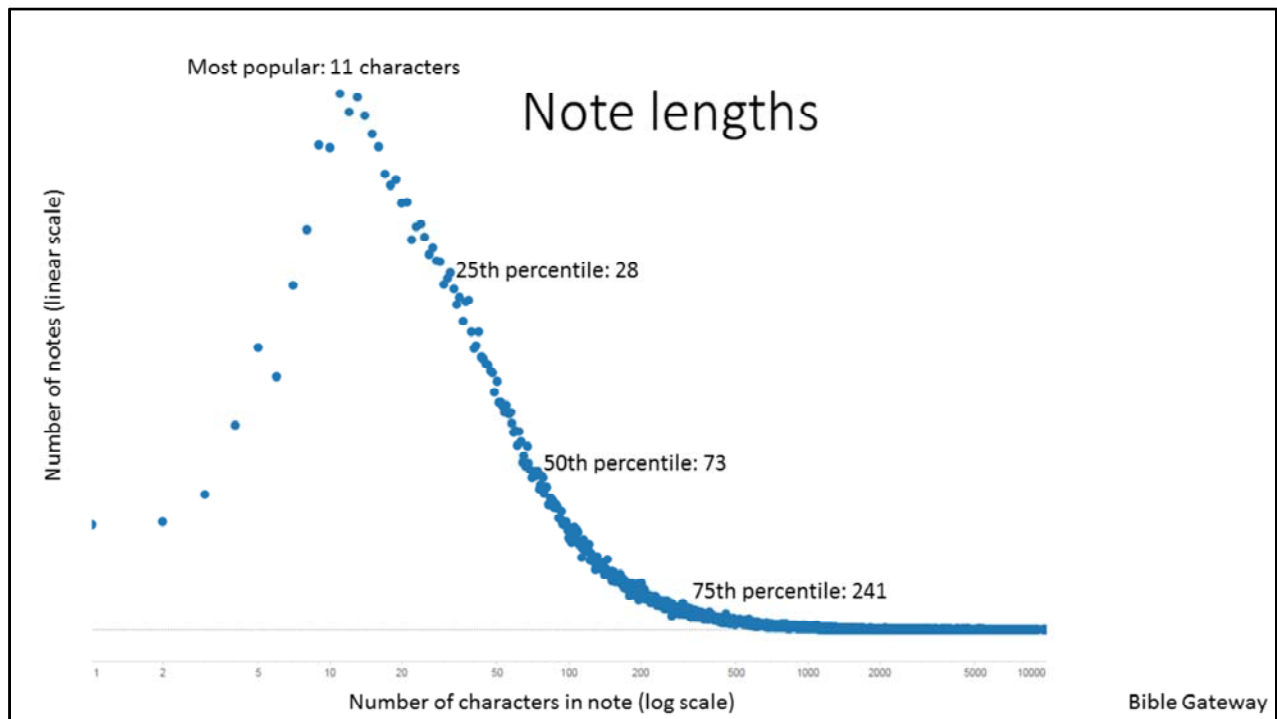
1Cor. 13 Bible Gateway



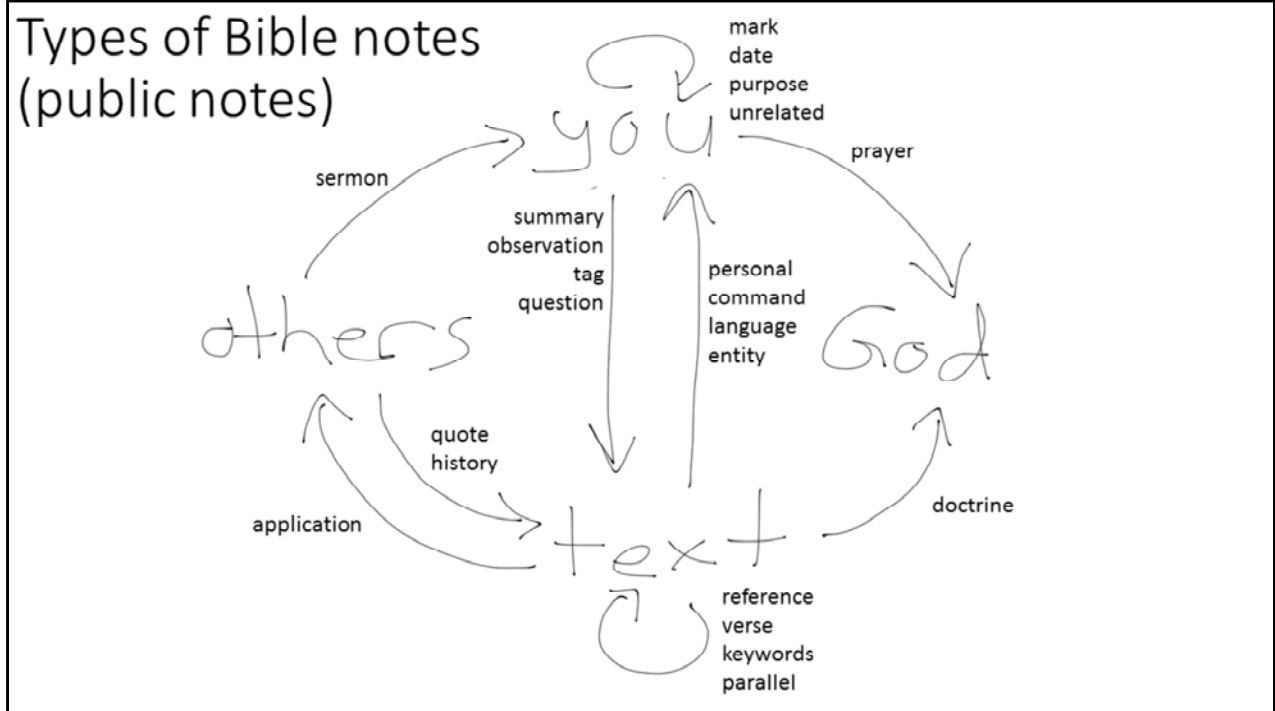
Highlight starts and ends

	Same verse		Another verse	
	At end	Before end	At end	Before end
Start of verse	20%	10%	18%	8%
After verse start	13%	12%	10%	8%
Total	33%	22%	28%	17%
Grand Total	55%		45%	





Turning to notes...

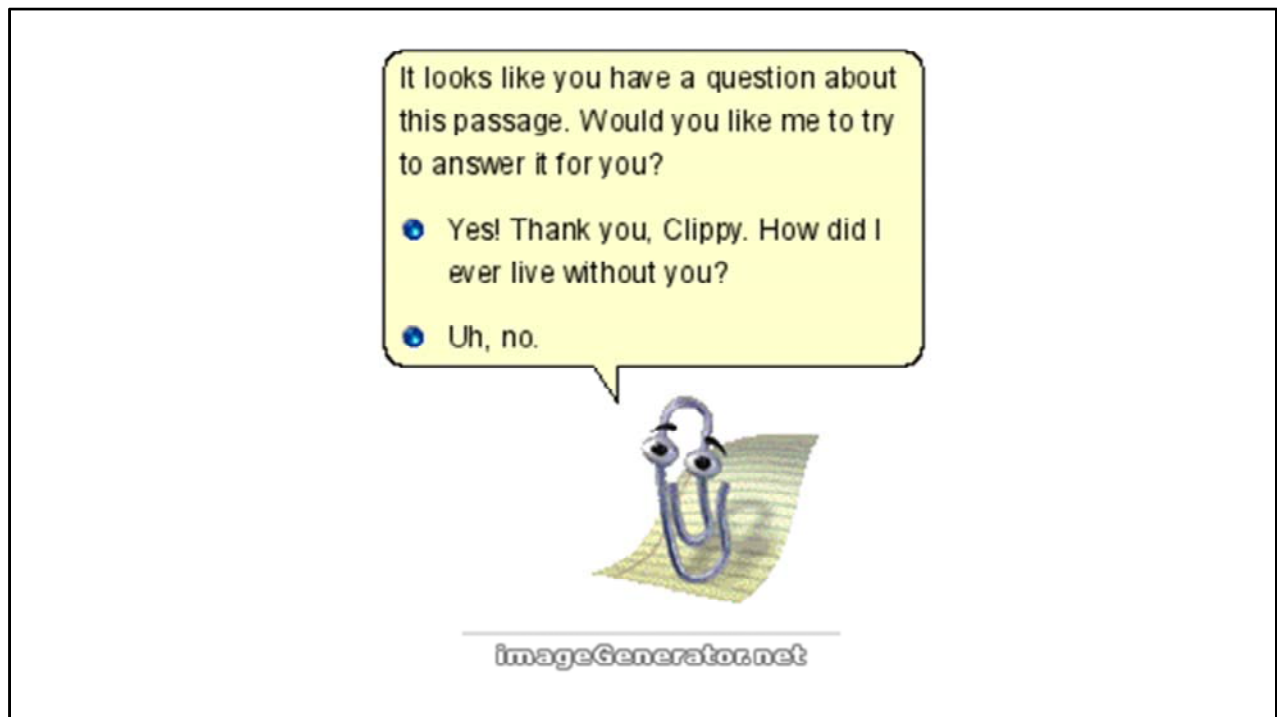


Two people hand-classified 1,000 of them with agreement between reviewers at around 70%. 22 Individual types bubbled up; we didn't have a predefined list of types going into this project. Similar to God/Others/Bible and a prayer schema we'll discuss shortly.

1. You → Text (28.2%)

- Summary. 9.3%. “God, he, no”
- Observation. 9.1%. “He, God, Jesus”
- Tag. 5.2%.
- Question. 4.6%. “What, this, why”

Main point of the passage—not interpreting anything. Observation: Something that stood out in the passage. It’s internal, like “this is a repeated word” or “oh, snap.” Tag: Main topics of the passage: one or two words (“love,” “faith”). Question about something in the passage. The single most common note is “?” followed by “???” “what?” and then “??” Opportunity for answering question inline? Clippy: “It looks like you have



The basic idea here could work, if not this implementation. "Philip"

2. Text → Others (16.9%)

- Application. 16.9%. “God, you, we”

Largest single type of note. How the passage applies to life today.

3. Text → You (15.8%)

- Personal. 8.5%. "I, my, me"
- Command. 3.0%. "Your, work"
- Language. 2.5%
- Entity. 1.8%. "He, was"

How the passage applies specifically to your life. Command: Do something the passage says. Language: English definition or original-language; almost all defining a hard word in English. Entity: About a person or place in the passage.

4. Others → You (14.0%)

- Sermon notes. Generally more application-focused rather than exegetical. “1, 2, 3”
 - Often has numbered points. 38% have at least three numbered points; 33% have five points.
 - Often has points that start with the same letter.
 - Usually includes date, speaker, title (including part number), Bible references, and personal notes.
 - When it doesn’t include this metadata, it’s hard to tell whether it’s a sophisticated “application” or a “sermon.”

Largest single type of note.

5. Text → Text (12.1%)

- Reference. 7.0%
- Verse. 2.8%
- Keywords. 1.6%
- Parallel. 0.8%.

Related Bible references (book-chapter-verse). 11% of notes overall explicitly mention a Bible reference, but some of them are categorized under different types. Verse: Text of a verse in the passage. Key: Partial quote from a verse in the passage. Parallel: Mentioning another passage by keywords ("David and Goliath"), not by reference.

6. You → God (4.6%)

- Prayer. 4.6%. "I, my, me, God"

Prayer to God.

“Inward, Outward, Upward” prayer types

- Inward
 - **Examination:** examining myself, devoting myself
 - **Tears:** misery, sadness, grieving
- Outward
 - **Radical:** seeking to be revolutionary
 - **Suffering:** agonizing with others
 - **Intercession:** asking for help for other people
 - **Petition:** asking for things I need
- Upward
 - **Sacramental:** engaging rituals
 - **Rest:** quietude, silence, stillness
 - **Adoration:** praising the divine (not in Ladd’s list but found in Laird 1991)

Adapted from Kevin L. Ladd, Bernard Spilka. “Inward, Outward, and Upward: Cognitive Aspects of Prayer”

Note Prayer Types (52 notes categorized)

Type	Percent	Count
Examination (examining / devoting self)	35%	18
Intercession (help for others)	23%	12
Adoration (praise)	13%	7
Tears (sadness)	10%	5
Radical (boldness)	10%	5
Petition (help for self)	8%	4
Suffering (agonizing with others)	2%	1

Most prayers aren't written down, so we don't know how representative they are. Also, these are public prayers, which may skew the totals. 7 of the 9 (missing sacramental and rest)

7. You → You (4.0%)

- Mark. 2.2%. “Reading, start, here, plan”
- Date. 1.3%
- Purpose. 0.4%
- Unrelated. 0.1%

Related to the act of reading itself, like “Start reading here.” Date: Date the passage was read. Purpose: Plans for the passage, like “Write on chalkboard for Sunday School.” E.g., a shopping list—something completely unrelated to the passage. There’s a rich history of using paper for unrelated purposes

8. Text → God (2.5%)

- Doctrine. 2.5%. "About, salvation, Scripture"

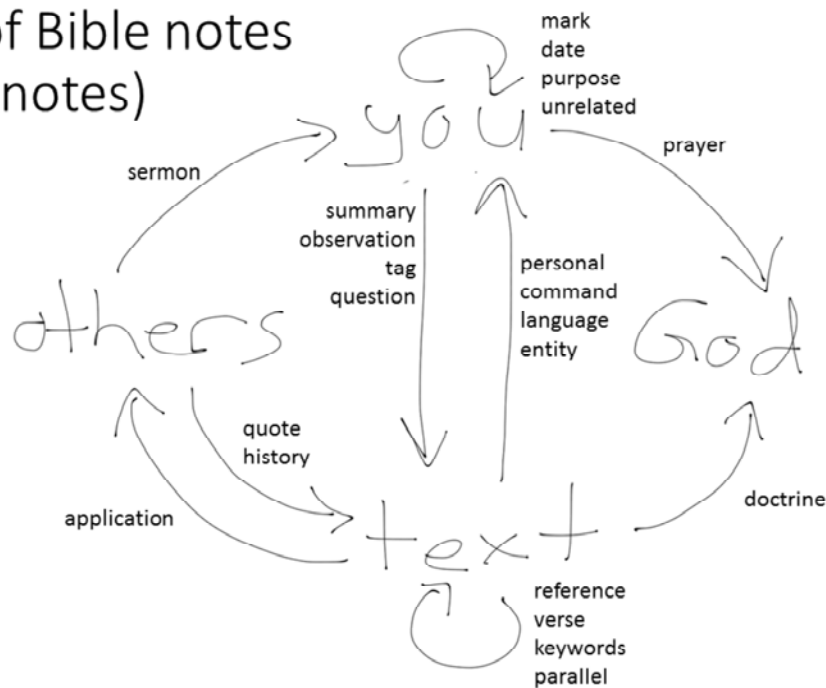
A specific teaching derived from the passage. Different from application in that the notetaker specifically names the doctrine involved, like salvation or trinity.

9. Others → Text (1.4%)

- Quote. 0.8%
- History. 0.6%. “Years, world”

Quote from a book or something else not from the passage. Could be a note from a devotional. One person mentioned Harry Potter. History: Historical/cultural background context for the passage. Something not internal to the passage but clearly gleaned from somewhere else.

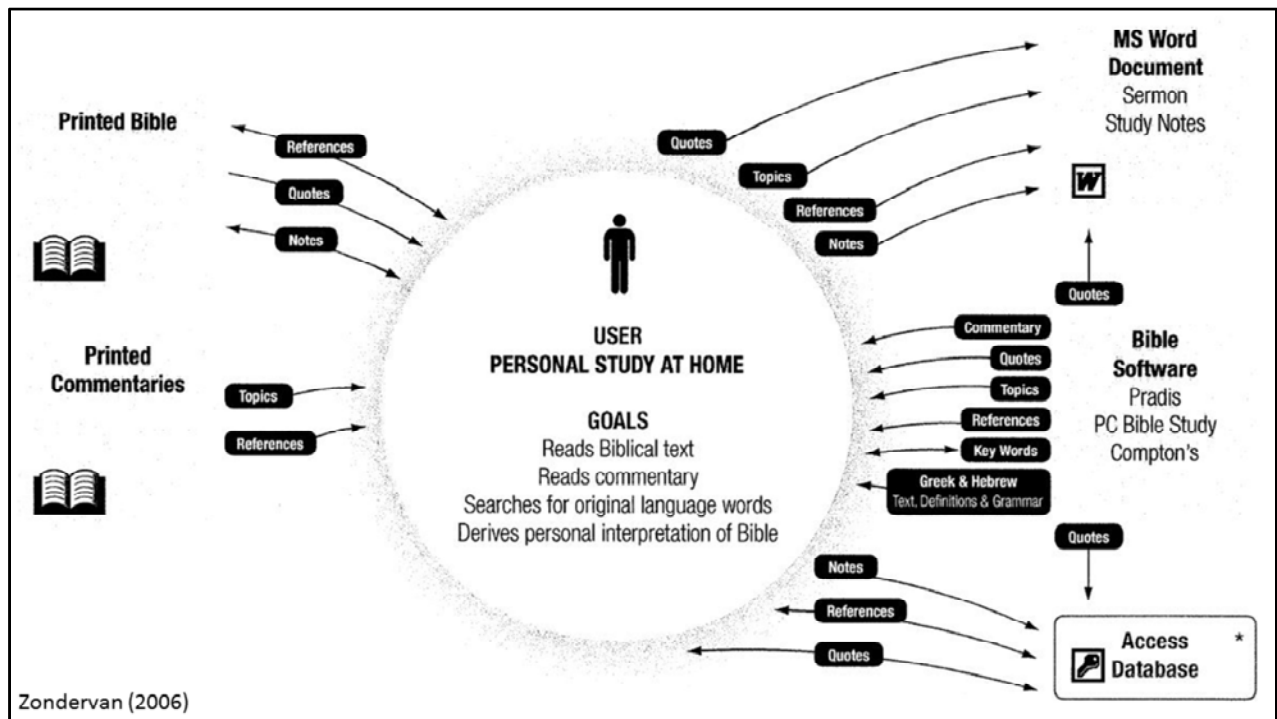
Types of Bible notes (public notes)



Missing: you → others. Sermon or small-group preparation is likely here, but people may use other apps. Confident in the individual types, less confident in the higher-level categories. People I asked to card-sort these types came up with a lot of variants.

Digital + print integration

Digital library metaphor especially breaks down. Sean Harrison talked about this yesterday.



Contextual inquiry created for Zondervan relating to their Pradis software in 2006. We need more research like this that explores the integration of print and digital.



Instead of e-ink wallpaper: e-ink sheets.

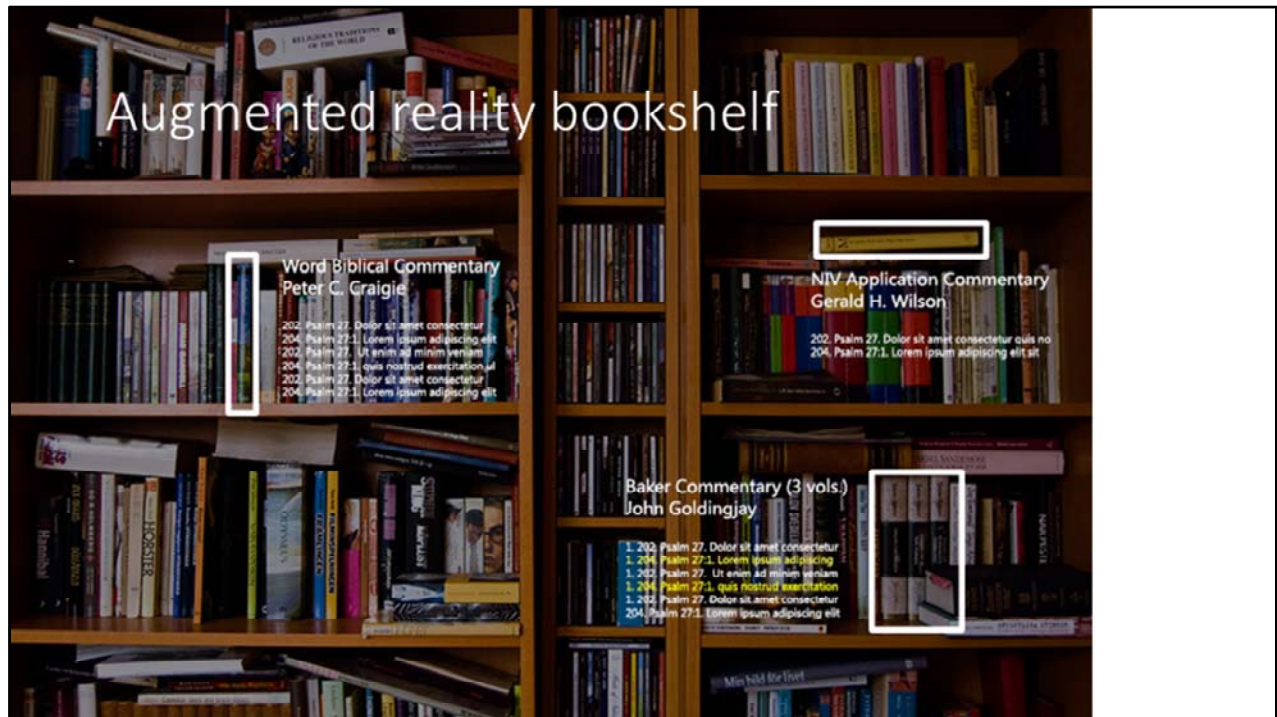


Poster that bluetooths music to your phone when touched. Book could know where you're touching, or a gilding could at least know what page you're on.

Augmented reality Bible study



Like Factbook.



Imaginative uses

Top YouVersion verses shared on Twitter

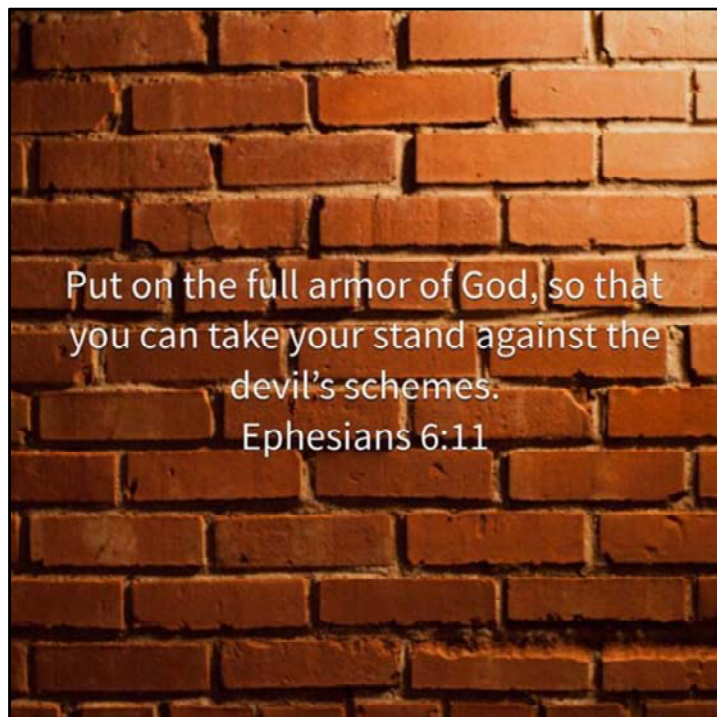
Image share	Non-image share	Rank difference
John 11:25	Rom 5:8	-1
Rom 5:8	John 11:25	+1
Isa 53:5	Eph 6:11	-16
Rom 12:2	Isa 53:5	+1
John 12:13	Rom 6:23	-20
Gal 5:22	Heb 11:6	-2
Isa 40:28	Rom 12:2	+3
Heb 11:6	Gal 5:22	+3

March 20-April 16, 2015

John 12:13 is “Hosanna” for Palm Sunday. About 40,000 image shares overall, or roughly 5% of their publicly announced totals for the time period.

Eph 6:11 image shares (“full armor of God”)





Put on the full armor of God, so that
you can take your stand against the
devil's schemes.
Ephesians 6:11

Eph 6:11 image
shares ("full armor
of God")

Not a great image? The point is that people behave differently.

Top YouVersion translations shared on Twitter

Image share	Non-image share	Rank difference	% difference
NIV	KJV	-2	-7.1%
NLT	NIV	+1	1.9%
KJV	NLT	+1	1.7%
RVR1960	RVR1960	0	0.9%
NKJV	NKJV	0	0.5%

March 20-April 16, 2015

KJV dropped from 19% to 12%.

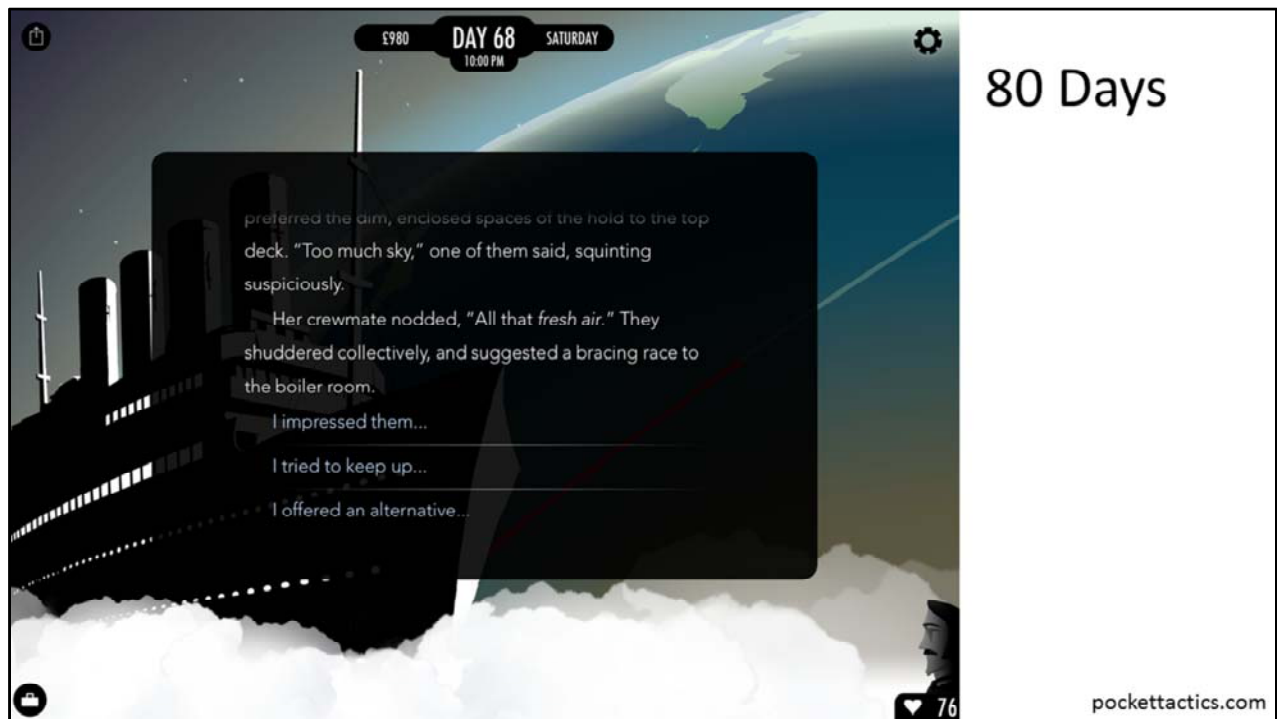


Bible journaling. Bible software doesn't do this. Digital library metaphor doesn't have room for it.

“Instead of killing Nazi soldiers in a castle, the player takes the part of Noah, wandering the Ark, using a slingshot to shoot sleep-inducing food at angry attacking animals, mostly goats, in order to render them unconscious.”
(Wikipedia)



Super Noah's Ark 3D. Whale Jail is another example.



Interactive fiction. Especially useful for catechisms.

Interactive fiction



Bart Ehrman

Bart Ehrman argues that the passage you're reading is a literary forgery.

Well, I don't know about that...

Tell me more, Bart...

That's crazy talk!

Explorable explanations

Proposition 21: Vehicle License Fee for State Parks

The way it is now:

California has 278 state parks, including state beaches and historic parks. The current \$400 million budget is insufficient to maintain these parks, and 150 parks will be shut down at least part-time. Most parks charge \$12 per vehicle for admission.

What Prop 21 would do:

Proposes to charge car owners an extra \$18 on their annual registration bill, to go into the state park fund. Cars that pay the charge would have free park admission.

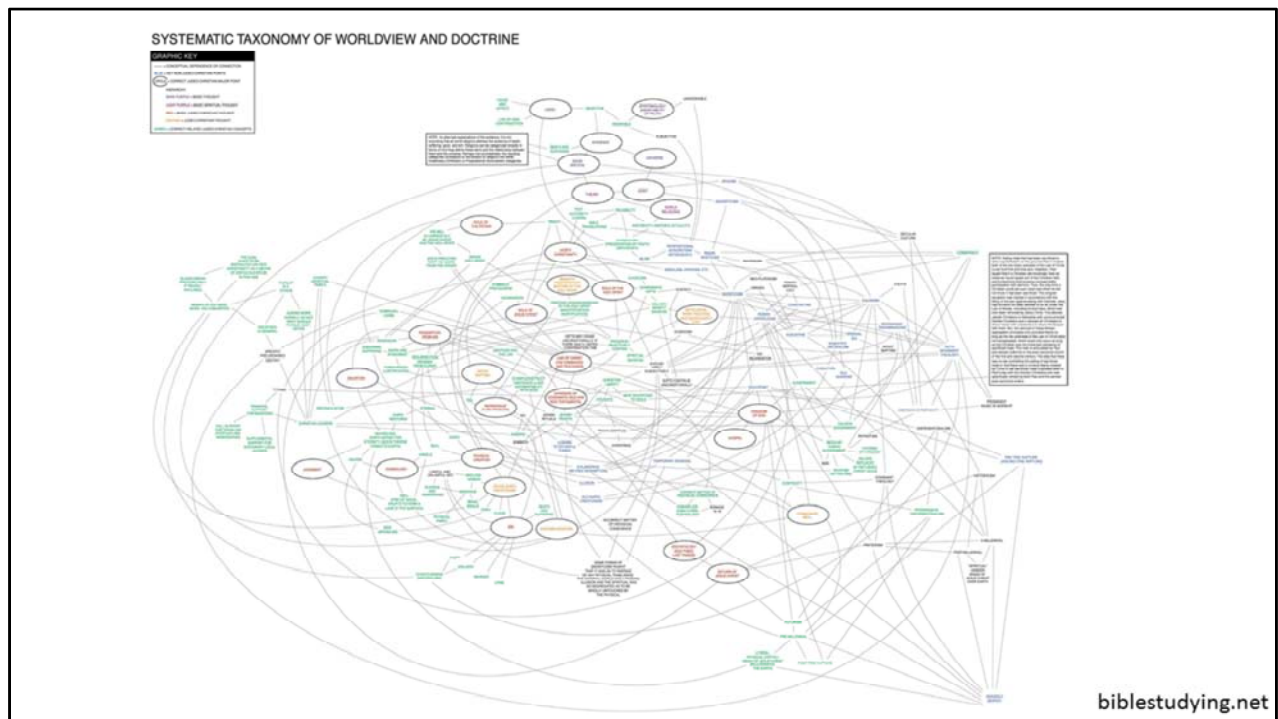
Analysis:

Suppose that an extra \$18 was charged to 100% of vehicle registrations. Park admission would be free for those who paid the charge.

This would collect an extra \$437 million (\$504 million from the tax, minus \$67 million lost revenue from admission) for a total state park budget of \$837 million. This is sufficient to maintain the parks in their current state, plus fund a program to bring safety and cleanliness up to acceptable standards over

worrydream.com

Bret Victor.



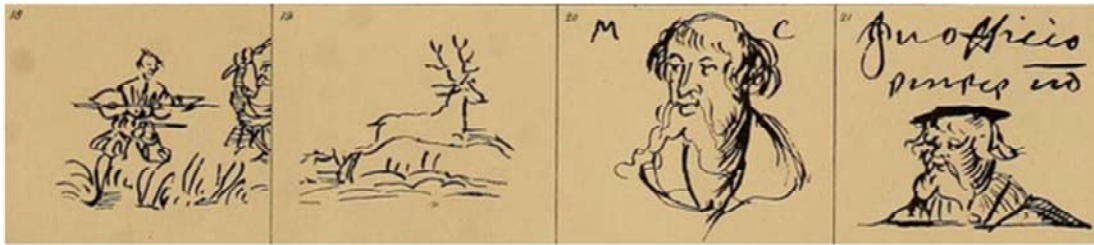
Explore assumptions and different viewpoints.

Popular emoji in public Bible notes

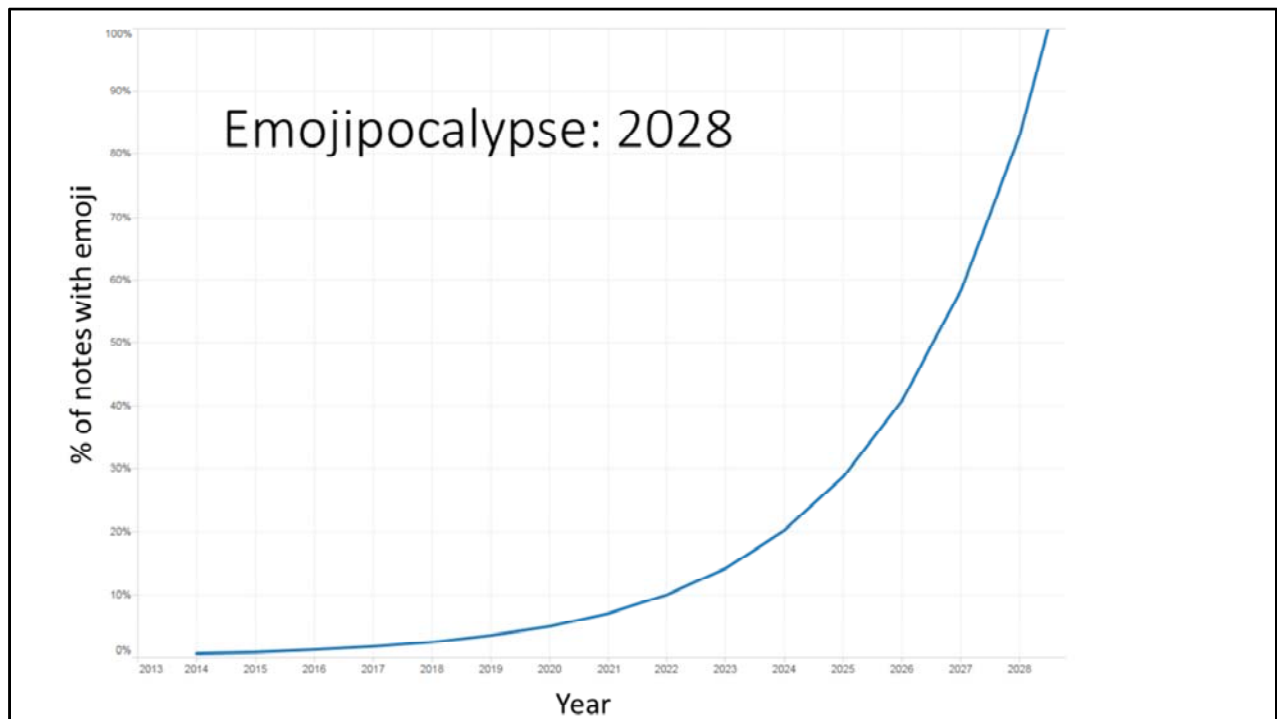


“Heavy black heart” vs. “smiling white face.” If you wonder why the Unicode consortium is sometimes accused of colonialism, here’s your answer.

Philip Melanchthon's marginal doodles (1497-1560)



archive.org



Currently 1-2% of notes in the dataset have emoji. At their rate of growth and thanks to the law of unwarranted extrapolation, 100% of notes will have emoji by 2028. Already over 4% of Bible verses shared on Twitter have emoji. Stockpile letters while you can.

stephen.smith@gmail.com