

# A Computational Bible Study of What to Love and What to Hate

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## Abstract

The Bible comprises the Old Testament of 39 books and the New Testament of 27 books. It can be viewed as the book of love, in which God revealed, out of His unconditional and unchanging love, His plan for the redemption of man in the Old Testament and fulfilled His promise made in the Old Testament by offering the one and only way of salvation through His son Jesus in the New Testament. In this study, we selected the Bible verses that contain the word love or its variation, which were then employed to cluster the books of the Bible with a computational approach. Of the 28 books containing the word love in the Old Testament, seven groups were identified: Genesis, Deuteronomy, Proverbs, Psalms, Song of Songs, First Samuel, and the rest of the other books. From the 26 books containing the word love in the New Testament, five groups were recognized: First Corinthians, John, First John, Luke and Mark and Matthew, and the rest of the other books. Furthermore, the major theme of love in each cluster was also elucidated. The opposite of love is hate. To gain the whole picture of love, we also selected Bible verses that contain the word hate or its variations. From clustering the books containing hate, different contexts of the word hate were recognized, teaching us to hate those that are contrary to love. Taken together, this computational study of the Bible demonstrated that God's law is designed to love and to love fulfills the law completely and perfectly. Our findings provided a complete catalog of different contexts and themes in which the word love is being presented in the Bible, thereby enabling better understanding of the Bible in this regard.

## Keywords

Bible, Love, Clustering

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## 1. Introduction

The question “what is love?” was asked more than any other Google queries in 2012 according to <http://www.today.com>,

reflecting the crucial significance and need of love, since a life without love is no life. In the world of today, so many strategies have been proposed to feel love, find love, or earn love as this world does desperately want more love. Love is defined in terms of action, attitude, and behavior. Our contemporary use of love usually refers to our feelings such as we love baseball or we love pizza. However, real love is purposeful rather than emotional.

People can give different definitions or meanings of love and much research has been conducted on the subject of love (Cowburn, 2003; Lamb, 1997; Soble, 1989; Chapman, 2009), but in this report we sought a computational Bible study of this important question. The Bible is composed of Old Testament (OT) and New Testament (NT). Based on contents, the 39 books in the Old Testament can be categorized into five groups, Law of Moses, history of Israel, poetry, major prophets, and minor prophets. The New Testament contains 27 books that can be divided into five sections as well, four Gospels, history of church, Pauline epistles, general epistles, and prophecy. The Old Testament is revealed in the New Testament while the New Testament is hidden in the Old Testament, with one illuminating the other.

In the Bible, God revealed Himself to man as God of creation, sovereignty, justice, holiness, faithfulness, mercy, and grace, demonstrating the highest form of love: God's love for man. As a result, the Bible could be considered as a great love book. In this study, we sought to categorize the contexts of the word love in the Bible and to identify the love theme in each of such contexts. The opposite of love is hate. To fully understand love as presented in the Bible, we also selected the Bible verses that contain the word hate or its variations. Our aim was to find out in what context this word of hate is used in the Bible.

## 2. Materials and Methods

### 2.1. The Text of the Bible

The text of the Bible used in this study is the King James version (1611 authorized version), downloaded from <http://printkjv.ifbweb.com>.

### 2.2. Affinity Propagation

The affinity propagation (AP) clustering algorithm (Frey & Dueck, 2007) aims to search exemplars from data to represent clusters through message passing. The data points within a cluster connect to the exemplar that best represents them.

### 2.3. Topic Model

Topic models explore the correlation between the observed words in documents and the latent topics in these documents, where each topic is defined by a group of related keywords (Griffiths & Steyvers, 2004; Griffiths, Steyvers, & Tenenbaum, 2007; Steyvers & Griffiths, 2007). The Latent Dirichlet Allocation (LDA) (Blei, Ng, & Jordan, 2003) is a simple topic model that assumes each document is a mixture of various topics. It uses generative probabilistic model to represent the topics in documents as probabilistic distributions, which could then be used to estimate the similarity between documents.

In the current study, the AP clustering algorithm was applied to group the books in the Old and New Testaments, in which each book was represented by its topic distribution as a vector in Euclidean space.

## 3. Results

We present our clustering analysis of the Bible verses in the Old Testament and New Testament containing the word love, hate, and love and hate, respectively. Several networks of love were created using some main characters as nodes, which were then connected with an edge if two nodes appeared in the same verse. A community detection algorithm was applied to each network and the communities found therein were displayed with different colors.

### 3.1. What to Love

#### 3.1.1. Clustering Books of the Old Testament by Love

There are 11 books in the OT that do not have the word love or its variations: 1 Chronicles, Ezra, Habakkuk,

Haggai, Joel, Jonah, 2 Kings, Lamentations, Nahum, Numbers, Obadiah. As a result, there are 28 books in the OT that do, which were clustered, by the AP clustering algorithm, into seven groups (Table 1).

Next, we exhibit the word cloud of the most frequent words (Figures 1-7), the love theme, and representative verses in each group.

**Table 1.** Groups of books in the Old Testament by love.

Cluster number	Books in one cluster
1	Deuteronomy
2	Genesis
3	Amos, Chronicles2, Daniel, Ecclesiastes, Esther, Exodus, Ezekiel, Hosea, Isaiah, Jeremiah, Job, Joshua, Judges, Kings1, Leviticus, Malachi, Micah, Nehemiah, Ruth, Samuel2, Zechariah, Zephaniah
4	Proverbs
5	Psalms
6	Samuel1
7	Song of Songs



**Figure 1.** Most frequent words in Deuteronomy.

Theme: Love the Lord thy God by keeping His commandments.  
 The Ten Commandments of God are given in Deuteronomy 5:4 - 21 as well as in Exodus 20:1 - 17.  
 Deuteronomy 5:10 And shewing mercy unto thousands of them that love me and keep my commandments.  
 Deuteronomy 6:5: And thou shalt love the Lord thy God with all thine heart, and with all thy soul, and with all thy might.



**Figure 2.** Most frequent words in Genesis.

Theme: Family love among father, mother, son, daughter, brother, Rachel, Isaac, Jacob, Rebekah, Leah.  
 Genesis 25:28 And Isaac loved Esau, because he did eat of his venison: but Rebekah loved Jacob.













different colors (Figures 13-16). Our results visualized the love stories in these groups. We also included several love verses that connected the nodes in each network.

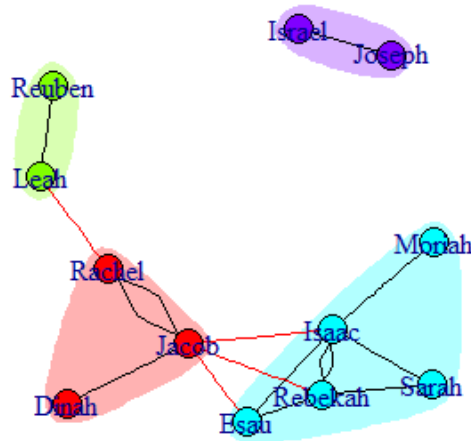


Figure 13. Love network of Genesis.

This network of love was made of the family members of Jacob. The two outlier nodes showed that Israel (Jacob) loved Joseph. The two nodes Israel and Joseph were not connected to the main core, because Jacob had another name Israel, a name given by God. Here are some love verses that were used to add an edge to two nodes in this network.

Genesis 37:3 Now Israel loved Joseph more than all his children, because he was the son of his old age: and he made him a coat of many colours.

Genesis 29:32 And Leah conceived, and bare a son, and she called his name Reuben: for she said, surely the Lord hath looked upon my affliction; now therefore my husband will love me.

Genesis 34:3 And his soul clave unto Dinah the daughter of Jacob, and he loved the damsel, and spake kindly unto the damsel. (Here the word damsel means a young unmarried woman.)

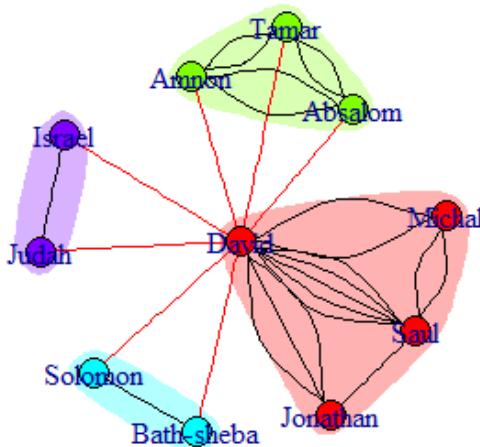


Figure 14. Love network of First and Second Samuel.

This love network mainly comprised the family members of David. Here are some love verses that were used to add an edge to two nodes in this network.

1 Samuel 18:20 And Michal Saul's daughter loved David: and they told Saul, and the thing pleased him.

1 Samuel 18:3 Then Jonathan and David made a covenant, because he loved him as his own soul.

2 Samuel 12:24 And David comforted Bath-sheba his wife, and went in unto her, and lay with her: and she bare a son, and he called his name Solomon: and the Lord loved him.





Deuteronomy 16:22 Neither shalt thou set thee up any image; which the Lord thy God hateth.

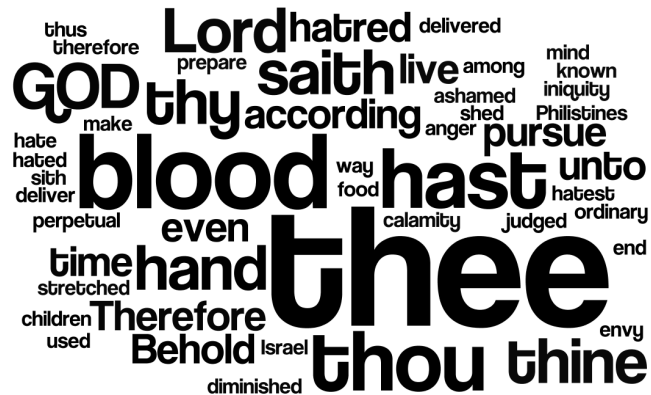


Figure 18. Most frequent words in Ezekiel.

Theme: As told by the prophet Ezekiel, God would punish the Israel people for not obeying His law by delivering them into the hands of their enemies who hated them.

Ezekiel 23:28 For thus saith the Lord God; Behold, I will deliver thee into the hand of them whom thou hatest, into the hand of them from whom thy mind is alienated. (God warned the Israelites of the coming judgment.)



Figure 19. Most frequent words in Genesis.

Theme: Hatred among the family members: Joseph and his brethren, Esau and Jacob. Further, other members were also involved: Isaac, Rebekah, Leah, and Rachel.

Just like in most families, there were love and hatred among the family members in this book. These stories recorded in this book offer timeless spiritual lessons, which are of great value to our daily living.

Genesis 29:31 And when the Lord saw that Leah was hated, he opened her womb: but Rachel was barren.

Genesis 37:5 And Joseph dreamed a dream, and he told it his brethren: and they hated him yet the more.



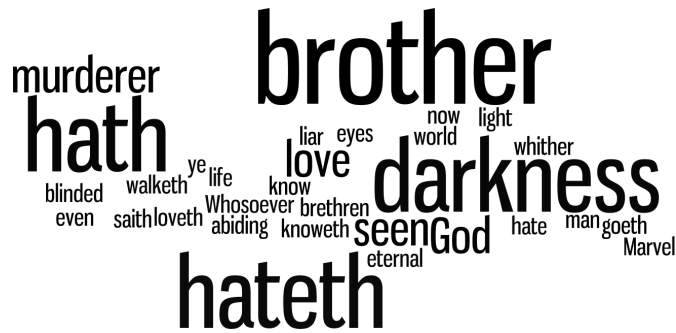
Figure 20. Most frequent words in other books of OT.





**Table 4.** Groups of books in the New Testament by hate.

Cluster number	Books in one cluster
1	John
2	John 1
3	Ephesians, Galatians, Hebrews, Luke, Mark, Matthew, Revelation, Romans



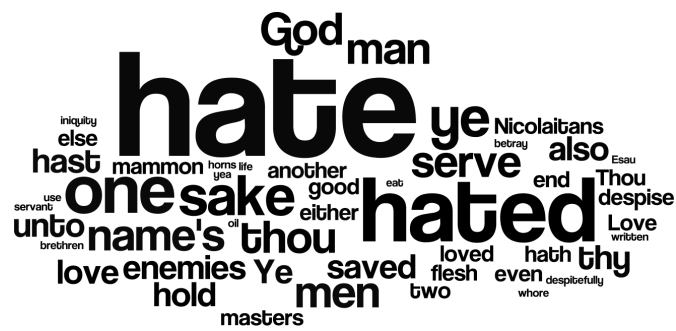
**Figure 25.** Most frequent words in 1 John.

Theme: Hate brother = murderer = in darkness.

John and 1 John are well known for their instruction on love, but here we showed that they also contain some unique verses relating what not to do in order to teach what to love. The Gospel of John emphasizes what the world would do in terms of hate, while 1 John stresses not to hate our brothers.

1 John 2:11 But he that hateth his brother is in darkness, and walketh in darkness, and knoweth not whither he goeth, because that darkness hath blinded his eyes.

1 John 3:15 Whosoever hateth his brother is a murderer: and ye know that no murderer hath eternal life abiding in him.



**Figure 26.** Most frequent words in other books of NT.

Theme: Hate and despise iniquity and mammon, but love and serve God, one another, enemies.

Several verses in the OT contain words like destroy or kill enemies, however the teaching of the NT is to love our enemies, i.e., to love those who hate us.

Luke 6:27 But I say unto you which hear, Love your enemies, do good to them which hate you.

Mark 13:13 And ye shall be hated of all men for my name's sake: but he that shall endure unto the end, the same shall be saved.

Matthew 6:24 No man can serve two masters: for either he will hate the one, and love the other; or else he will hold to the one, and despise the other. Ye cannot serve God and mammon.

### 3.3. What to Love and What to Hate Concurrently

The Bible instructs us to love God and hate sin (anything against God). To emphasize what to love, many verses

tell what to hate along with what to love in the same verse as a contrast. Here we collected these verses in the OT and NT respectively and illustrated the word cloud of the top words (Figure 27, Figure 28) and the theme of each.

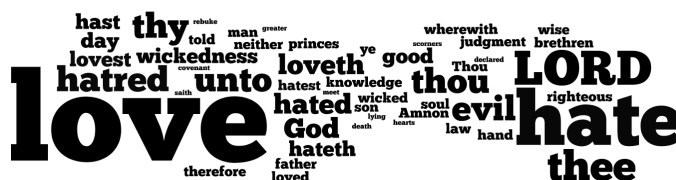


Figure 27. Most frequent words in Old Testament.

Theme: Love the Lord thy God, law, knowledge, righteous, wise, father, brethren, good, but hate evil and wickedness.

Psalm 97:10 Ye that love the Lord, hate evil: he preserveth the souls of his saints; he delivereth them out of the hand of the wicked.



Figure 28. Most frequent words in New Testament.

Theme: Love God, one another, brother, neighbor, enemies, and hate and despise evil and mammon. (The world loves mammon and evil, but hates God.)

The major difference between the love themes in the OT and NT is that love or obey the law of God is imperative in the OT while love your enemies is prominent in the teachings of the NT, since love is described in the NT as the perfect fulfillment of the law. The OT teaches thou shalt not kill whereas the NT says thou shalt not hate thy brother in thy heart, i.e., hatred is as serious as murder. Thus in a sense the law of love introduced in the NT requires more than the law of Moses does in the OT as what we have in our heart determines what life we can live.

Hebrews 1:9 Thou hast loved righteousness, and hated iniquity; therefore God, even thy God, hath anointed thee with the oil of gladness above thy fellows.

1 John 4:20 If a man say, I love God, and hateth his brother, he is a liar: for he that loveth not his brother whom he hath seen, how can he love God whom he hath not seen?

Matthew 5:44 But I say unto you, Love your enemies, bless them that curse you, do good to them that hate you, and pray for them which despitefully use you, and persecute you.

#### 4. Discussion

The Bible presents the great commandment in both the OT and NT: Love the Lord your God and love your neighbors as yourself (Deut. 6:5, Lev. 19:18, Matthews 22:37 & 39, Mark 12:30 - 31, and Luke 10:27). Remember that the order of the word love appeared in this commandment is critical. Only when people love God first, then the love for man comes naturally as an appropriate response to His love and grace. On the other hand,



God's love is so great that He hates sins since He is holy and naturally His love is holy. All the commandments of God given in the Bible are not for His benefits but for ours. Following God, we ought to hate sin but to love sinners. Loving God means to know Him and keep all His commandments. In the books of Kings, the good kings who followed God's commandments ruled 33 years on average, however the bad kings only 11 years, which undoubtedly conveys that God is the maker of history. Therefore, a better understanding of the biblical teaching about love is important for life.

Many problems with love in this world are that we are seeking love from man first, without realizing that God is the source of love since God is love (1 John 4:8). Therefore, we must seek Him first. The Bible offers the golden rule of life: treat people the same way you want them to treat you (Matthews 7:12), which encourages us to love so we can be loved. Our daily life witnesses how this law of love works in the real world. To love God and our neighbors is the target God sets for us, and any miss of this target is sin, including not only our actions but also our thoughts and attitudes as sin starts in the heart.

There are many Bible verses pertaining to love. In First Corinthians 13 Paul explains in great detail what love does and describes the excellent way of love. Love is giving, not getting. Love treats the interest of others as primary focus and self-interest as secondary. Love one another as God has loved us first, i.e., God's love for us produces love in us. The salvation of man is available by the love of God (John 3:16). Love can involve emotions; however it is more a commitment of the will than feelings. Our emotions may vary under different circumstances but biblical love endures and is unchanging.

Though the commandments of loving God and loving neighbors are taught in both the OT and NT, but in the NT Jesus commanded to love your enemies and do not repay evil with evil. Compared to the OT, this is a distinct character of the love presented by Jesus.

The current study focused on the Bible verses that contain the word love; nevertheless there are books in the Bible that do not use this word at all. The book of Jonah, though having no plain love words, shows the great love of God Who persistently sent the prophet Jonah to preach a message of repentance to the people in the Assyrian city of Nineveh, so they could be saved from destruction. Similarly, there is no explicit mention of the word love in the book of Ruth, but the love and care between Naomi and Ruth, Ruth and Boaz were clearly evident in their acts to obey God's law and their seeking the benefits of others. Their story demonstrates that God's law is designed to love, which fulfills the law completely and perfectly. During the dark age of judges, there was this beautiful story of love between Ruth and Boaz. Years later David, a grandson of Ruth, changed the age of everyone following his own desire during the period of judges to an age of worshiping God. Although there were many events and people in history that could be recorded from a human point of view, but the Bible only recorded those that were important to God.

## 5. Conclusion

In summary, this study provided a complete catalogue of love themes presented in the Bible. Throughout the whole Bible, it highlights the primary commandment to love God and our neighbors because God is love, and to hate sin because God is holy. The Bible not only teaches what to do but also what not to do. There is a smooth focus shift from the Law of Moses in the OT to guide our actions to the law of love in the NT to guide our heart. God's commands were given out of His love for us, so they are law of life, whose purpose is to lead us to live our life to its fullness. The practice of love can truly reflect the fact that we are made in the image of God. Our desire is to ask God to fill us full of His love so it overflows naturally into the lives of others, i.e., let the light of God's love shine in us and through us.

## Acknowledgements

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