The History, Development, and Implications of Morse Code from a Semiotic Perspective

Margaret Kilpeck

Abstract

This paper will explore the system of Morse Code from a semiotic perspective. The discussion will address topics such as the history of the code and the state of communication at the time, as well as the specific parts of the code. This discussion will open the reader's eyes to the intricacies and intentions of the code and its creators, opening eyes to just how powerful and significant the realm of semiotics is in everyday life.

Introduction

This paper will provide the opportunity to explore the various elements of Morse Code from a semiotic [[47]] viewpoint. Each section, aside from the introduction and conclusion, will focus on a particular aspect of Morse Code by utilizing semiotic ideas. This will be the first section of the paper.

The second section of this paper, titled "The Era of the Telegraph", will look at semiotic ideas of biosphere [[1]] and the sign [[51]] in relation to the dawn of the telegraph. This will allow me to detail what circumstances in the world at the time lead to the invention of a code to swiftly transmit ideas and messages ((2, 3)). This section continues to talk about this time period in terms of modernism [[28]] and the specific aspects of it that existed during this time of innovation and progress. This section also discusses the how Morse Code can be viewed as a conceptual metaphor [[4]] and a person's image schema [[21]] can influence how they perceive certain domains of the metaphor ((7)).

The third section of this paper, titled "The History of Morse", will preface the discussion of Morse Code with an explanation as to why the code was required in the first place. The telegraph needed a fast and efficient system of communication, thus Morse Code was invented ((2, 3, 9)). The discussion goes on to detail the implementation of features to the code to create a more inclusive alphabet for communicating ((2)). This change resulted in two separate iterations of the

code, one of which was more widely used throughout the world and the other which stayed in the United States ((11)).

The fourth section of this paper, titled "The Components of the Code", will discuss the components of Morse Code and explain how each letter is assigned a series of dots and/or dashes. This section will also introduce the concept of code [[2]] as a set of provisions for how to process and interpret things. The ideas of paradigm [[34]] and syntagm [[61]] will be discussed in this section, as they pertain to how these dots and dashes combine in different variations to create specific forms ((1, 7, 9, 10)). Structural economy is discussed next, followed by a related discussion on the length of the various constituents and the indexical [[23]] nature of the code ((6, 8, 9)).

The fifth section of this paper, titled "Producing Morse Code" will revolve around this code as a means of non-verbal communication. It will also touch on the aspects of gesture, kinesics, and proxemics [[15, 25, 42]] and how movements of the body can stand as signs and appear in some deliveries of Morse messages, such as blinking out the code with one's eyes or using one's hands to clap out the code ((5, 6, 10)).

The sixth section of the paper, titled "What's It To You?" looks at the idea of signifying order [[50]], which posits that there are two methods of signification in semiotic systems: denotation and connotation. The section goes on to shine a light on the denotation [[9]] and connotation [[6]] of the dots and dashes used in the code. These constituent parts of the code would be seen as simple flashes of light or short spurts of sound (depending on the method of transmission) to an unwitting person, but someone who knows the code would interpret these signs differently ((5)).

The seventh section of this paper, titled "A Peircean Take on Morse Code", discusses Peirce's ideas of firstness, secondness, and thirdness [[14, 46, 64]] qualities in how signs are interpreted. Additionally, Peirce's triadic model of the sign [[52]] is discussed in detail. The ideas of secondness and thirdness are the most apparent in this code, however, that does not mean that there are no firstness qualities at work in the code or how it is deciphered ((7)).

The eighth section of this paper, titled "How Saussure Would See the Code", will use Saussaurean perspective [[53]] for an overarching examination of Morse Code, from its history and development to a brief discussion of its implications on the code itself. I will look at how the symbols are used as signifiers [[56]] and the letters they are representing as signifieds [[55]]. Saussure's ideas of langue [[26]] and parole [[36]] also have implications for how Morse Code can be used and interpreted by those familiar with the code as a complete language. ((7))

The ninth section of this paper, titled "Jakobson's Functions of Communication in Morse Code", relates the conative, emotive, referential, phatic, poetic and metalingual functions of communication [[3, 13, 37, 38, 43, 27]] to the delivery of a message through the use of Morse Code. Although we are dealing with a code non-verbally transmitted through radio waves or flashes of light, these facets of communicative processes still hold true and exist amongst communicators ((1, 4, 7, 10)).

The conclusion of this paper summarizes the semiotic ideas that are presented and discussed in relation to Morse Code throughout the entirety of the paper.

The Era of the Telegraph

The introduction of the telegraph in the 1840s revolutionized the way in which communication over long distances could occur. The biosphere [1] of communication at the time was no longer able to keep up with and meet the demands of an ever-growing and evolving society. Old practices were not efficient or sustainable, and thus made effective long-distance communication very difficult. People were ready for a change in how they could communicate efficiently and effectively. This mindset of progress and innovation parallels the ideas of modernism [28], which revolves around progress, optimism, rationalism, the search for absolute knowledge, and a quest for perfection. Individuals such as Samuel Morse took the initiative to catapult ideas into reality and change the entire trajectory of human culture and communication.

With a passion for electricity, though little experience in other scientific fields, Samuel Morse was one of the key contributors to the invention of the telegraph. The fire was lit in him to begin the process of creating a long-distance communication device after the death of his wife. By the time he received word of her death by letter, it was already too late for him to return home for her funeral (5). After this experience, he began working on his model for a telegraph prototype, which he would later demonstrate the functioning of publicly in 1837 (5). Using his knowledge and love of electricity, he created a telegraph which sent out electrical pulses which would flow into the receiver. This is where the need for a code comes into play.

After the code was put in place and telegraph lines were set up throughout the nation, the telegraph started spreading like wildfire throughout the nation. Using this system which he and his partners had just created, Morse was given the opportunity to build an experimental long-distance telegraph line. He was provided a $30,000 grant from Congress in 1843 to build this line stretching from the city of Washington D.C to the city of Baltimore, Maryland (10). One year later, in the Supreme Court Chamber of the US Capitol, the first encoded message was sent from Samuel Morse to his partner Alfred Vail, who was awaiting his message from Baltimore. Another significant time in which the telegraph and Morse Code were used in history was during

the Civil War. To be aware of the action and events unfolding on the battlefield, President Abraham Lincoln utilized the telegraph during the war, allowing him to make correspondence across the country (5). Further down the road, after Morse Code and the telegraph had been somewhat disassociated, Morse Code came to be used in many facets of the military and on many vessels. Most notably, the code was used in World War II and the Korean War and Vietnam War (2).

Not only do the combinations of dots and dashes of Morse Code stand for something, but so too does the advent of Morse Code. Although it can be discussed how the inventions of the telegraph and Morse Code were signs [51] that the world needed a faster and more reliable communication system, we can also look at the advent of this biosphere-changing phenomenon as a conceptual metaphor [4] for strength, power, and progress. Conceptual metaphor is the process of understanding one conceptual domain in terms of another. In the case of Morse Code, the advent of the telegraph and the code, the way it revolutionized the way in which humans can connect over long distances, and its role as the turning point for communication technologies . The two components that make up a conceptual metaphor are the target domain and the source domain. If the era of the telegraph is viewed as a conceptual metaphor for power, strength, and progress, then the period of development and implementation of Morse Code as an innovative and more efficient form of communication would be the source domain. Thus, the concepts of power, strength, and progress would serve as the target domain, or what the conceptual metaphor is hoping to achieve by making the comparison. A person's prior experiences with these three attributes would have led to the formation of their image schema [21] for that concept, thus contributing to the accuracy of the metaphor, according to them, in denoting what it is intended to denote.

The History of Morse

The invention of the electric telegraph largely altered the biosphere [1] in which it made its entrance into in the 1830s and 40s. No longer were people having to send letters by horseback as their sole means of correspondence with friends or family in far reaches of the country. The telegraph made it possible for people in two completely different cities to communicate in an instant, as is evidenced by the very first telegraphed message, transmitted from Washington D.C. to Baltimore, Maryland (3). However, for this to be possible, a system of message creation was needed. From this necessity, Morse Code was born.

Evident from the name, Morse Code was formulated by Samuel Morse upon completion of the electric telegraph. Not evident, however, is the diachronicity [11] of this code over its lifetime. This code was to be used as the code from which messages could be created for telegraphic transmission. In its original manifestation, the constructed code consisted of patterns of dots and

dashes that encoded only numbers, not letters. Although this worked for some messages, quickly it was realized that this was not the most efficient code for transmitting messages. Morse went back to the drawing board, and with the help of his partner, Alfred Vail, they were able to expand the code to account for letters, numbers, and certain special characters (6). Although this adequately served the needs of long-distance communication in the United States, once this new communication reached Europe, it was evident once again that revisions were needed to make the code universally accessible. The letters accounted for by the codes were only those utilized in American English, thus leaving out diacritically marked letters which are frequently used in European languages. Because of this discrepancy in the code, a conference of European nations gathered in 1851 to devise the International Morse Code, also known as the Continental Morse Code (2). Despite the great amount of similarities between the two systems of code, the more recently revised International code is characterized by simplicity and precision, while the American Morse Code is not as succinct or easy to use.

The International Morse Code quickly took the world by storm; however, the American Code was still widely used in the United States. With the telegraph industry still rampant in the US, the American Code was never abandoned there (2). American Morse Code was 5% faster to send, thus U.S. telegraph companies kept it as their standard form of communication. Despite the decision at the 1912 Radiotelegraphic Convention meeting in London to send all radio signals using the International Morse Code, domestic radio traffic on the Great Lakes and along the coasts still heavily made use of the original American code (11).

The Components of the Code

Morse Code consists of two main components: dots and dashes. These components in various arrays of formations and variations, along with the use of space to indicate separate letters and words, make up the entirety of the code [2] for the alphabet and number system used in Morse Code to form and transmit messages. Although the codes used to indicate each letter may seem arbitrary and to have no rhyme or reason, the Code and each of its symbols [58] was created in a specific way to make them as efficient and succinct as possible. The way in which these symbols combine to provide meaning is through their proximity to each other and depending, in large part, on how spaced out or not the constituent elements are.

The entire array of dots and dashes and spaces, along with the length provided for each, that can be pulled from to comprise codes for each letter and number constitutes a paradigm [34]. Pulling from these various components, combinations can be created which symbolize letters and numbers. Any of the constituents can be drawn from, in any order and any quantity of each to form more strictly-ruled combinations of dots, dashes, and pauses, which form syntagms.

When dots and dashes are arranged in specific orders to signify specific letters or numbers, these are referred to as syntagms [61]. Syntagms are the specific combinations that are strictly defined by the specific order of constituents in the whole. If one part is switched out or moved, the syntagm completely loses its original identity and inherits a new meaning entirely. In addition to the dots and dashes, the pauses in between each play a major role in the formation of syntagms. If a space of three units length is accidentally added between the symbols denoting a single letter, the syntagm is completely broken and no longer holds the desired meaning (or likely any at all). The meaning could be changed if the syntagm of a new letter is formed. For example, if this type of blunder took place in the midst of the letter 'S', signified by '...', the syntagm would now signify completely different things. The code would read '.   ..', representing the letters 'E' and I', respectively (1, 9).

An important idea of Morse Code is that of efficiency and succinctness which was the intent of Samuel Morse upon original creation of the code. This desire for fast communication translated to the codes which stood for each letter. The main proponents of the code analyzed which letters were most and least frequently used. Those that were used quite often were given the shortest and most succinct codes. The letter 'E', for example, is transcribed by a single dot, while 'Q' is significantly longer, transcribed as '- - . -' (9). This idea of assigning codes based on frequency of the digits parallels the semiotic principle of structural economy, which posits structure evolves over time to become smaller and more compact (7).

One of the most important factors to be cognizant of when producing a message in Morse Code is that of constituent length in relation to other parts of the code. This is an indexical [23] process which determines the length of units based both upon the speed of transmission as well as the duration of previous characters. The length of a dot is one unit of time. The duration of a dash has an indexical relation to the dot because it is three times the length of the dot, whatever that unit of time may be (9). This being said, there is no temporal specification for how long one unit of time is in Morse code. A general rule of thumb is a dot should be the length of time it takes to say 'dot'. A dash, in turn, is the time it would take to say 'dot' (or dash) three times. Measuring the length of dots and dashes in relation to each other helps to make the code consistent no matter how fast or slow the transmission of the message may be (6). Another essential aspect is the length of pauses between constituents. Pauses come in three different lengths. Between dots and dashes in an individual character, there is a space of one unit, the same length as a dot. Between letters (characters), there is a space the same length as a dash, three units in length. Finally, a pause of seven units in length denotes a space between words (8).

Producing the Code

As discussed in previous sections, Morse Code was first developed as a simple code for communication over telegraph to transmit messages overseas. The interlocutor sending the message would tap out their message using the letters of Morse Code on the receiver of the telegraph, which would then elicit electrical pulses of different lengths. The lengths of these pulses would determine their classification as either 'dot' or 'dash'. But with a code as simple in theory as this, a telegraph is not needed to transmit Morse-coded messages. As is evident by the concept of the telegraph and Morse code itself, verbal communication is not always the only way to communicate. The concepts of gesture [15], kinesics [25], and proxemics [42] play a role in how Morse Code can be used outside the realm of electrical pulses.

Morse Code is an extremely versatile communication system which, although created specifically for use with the newly-invented electric telegraph, has found its uses outside of the realm of the telegraph. Specifically, Morse code can be conveyed through the use of bodily gestures [15], still utilizing the same code that is transmitted via electrical signals. Some gestures that are able to effectively communicate the code are clapping the hands, stomping the feet, slapping a surface, or even blinking. A famous example of gesture being used to subtly transmit an encoded message dates back to the Vietnam War, when prisoner of war Jeremiah Denton blinked out the letters T-O-R-T-U-R-E while appearing on North Vietnamese television. Although he did not have a formal means of communication, his use of gesture, combined with Morse Code, was able to transcend his calm demeanor and spoken message of contentment and tranquility that he was being told to send. With these gestures, all components of the code remain the same. Spacing and length still adhere to the same rules and patterns that they would if the code was electrically transmitted. Gesture simply makes communication more versatile and, in cases such as Jeremiah Denton's, more discrete and under the radar (5, 6).

Despite the inherent distance between interlocutors while using the telegraph, the invention is a prime example of how proxemics [42] plays a role in non-verbal communication. The large distance between the people on either side of the line causes the need for such a device to be used. The device subsequently brings them closer, albeit only figuratively and audibly. Thus, proxemics is at work in the usage of Morse Code not because interlocutors are near each other or are communicating face-to-face, but because of the lack of proximity and the need and desire to be closer (7).

Kinesics [25] is the study of body signals, such as those mentioned above, and how they are a form of nonverbal communication that serves to convey meaning without the use of spoken words (7). Body movements and gestures that stand as signs can be both conventional [8] and natural (31). Some body signals such as inadvertent blinking are natural responses of the body to the surrounding environment. Other kinesic signs such as waving or shaking one's head are conventional signs whose meaning has been built out of societal practices and assimilation over

time. They are learned signs which, without any knowledge of, would not hold any inherent meaning.

What's It to You?

The basis of Morse Code lies in the dots and dashes used to form letters and words. However, if one does not have an understanding of this concept or is not familiar with what specific combinations of dots and dashes form what letters, they will not understand the significance of a series of dots and dashes. Roland Barthes concept of signifying order [50] lays out a framework for the structural levels of signification, meaning, and representation [45] that are laid upon signs [51], positing that signs are interpreted in either a denotative or connotative manner. Denotation [9] is the first level of signification and connotation [6] is the second level, and each contributes in a unique way to the way in which a person interprets a sign.

The interpretation of Morse Code relies heavily on the knowledge of the receiver on the specific codes of each letter. This means both interlocutors must be aware of the specific arrangements of dots and dashes letters are composed of. The concept of signifying order [50] lays out the roles that both denotation and connotation play is sign interpretation. In the case of Morse code, the difference between the two equates to being able to effectively use the code or not.

The concept of denotation [9] is applicable to Morse Code by what dots and dashes mean to a person. Looking at a written out example of Morse Code, full of dots, dashes, and spaces, from a denotative perspective, they would be defined as, well, simply dots and dashes that don't hold any significance. Without knowing anything about the dots and dashes that make up the code, a person would interpret the signs directly as what they are.

If a person untrained in or unfamiliar with Morse Code was looking at written-out Morse Code, because of their lack of knowledge on the code, they would be able to provide a denotational definition of what they were looking at, but nothing else. The components of the code would be defined simply as dots and dashes and would have no other meaning attributed to them. Likewise, if the code was delivered by means of flashing lights or clapping, the flashes and claps intended to represent letters or parts of letters would be seen simply as flashes of light or claps. They would seemingly be arranged in a random, non-purposeful way and make no logical or meaningful sense to the viewer. Denotation is the literal explanation or definition of a sign, thus, the signs inherent in the dots and dashes would be defined in a denotational manner if no other context exists.

If a person familiar with Morse Code and the combination of dots and dashes for each letter were to see or hear any form of Morse code produced, they would have a different interpretation of the sign [51]. The sign in this context is the dots and dashes separately as well as structured in specific patterns. Someone with prior experience with or knowledge of Morse Code would interpret a sequence of dots and dashes, or short and long flashes of light or claps, as signifying certain patterns and letters of Morse.

A Peircean Take on Morse Code

Each syntagm [61] of dots and dashes that combine to represent [45] an individual letter or number constitutes a sign [51] in Morse Code. Each time a combination of dots and dashes is transmitted by some mode of delivery, the receiver must interpret the sign which is the message, standing for letters that encode meaning and context. Throughout the history of semiotics, semioticians have tried to define and deconstruct what a sign is and what parts are necessary to construct it. One of the most widely accepted and revered explanations of a sign comes from the American philosopher and semiotician Charles Sanders Peirce. Along with his triadic model of the sign, Peirce developed a concept of three distinct levels of meaning, which he called firstness [14], secondness [46], and thirdness [64].

Peirce defines a sign by three components- the representamen [44], the object [33], and the interpretant [22]. In Morse Code, each combination of dots and dashes separated by single spaces is the representamen for a letter of the alphabet or a digit 0-9, used in transmission over telegraph signals. Each letter or digit encoded acts as the object; it is the thing that the sign is referring to. The third component of the triad is the interpretant; in terms of Morse code, that would be the idea of a letter or number to the viewer of the sign and what it elicits in their mind.

While not an overly exhibited example in the case of Morse code, there are still some firstness [14] tendencies that can be extracted from the realm of Morse code as a whole. Firstness is the level of meaning interpretation based on isolated perception and reflexive feeling or emotion. Where this tendency can be found in the course of Morse code's history would be in the setting of where the first message transmitted and received by means of the electric telegraph and Morse code took place. In both of the rooms - one in the US Capitol in Washingon, D.C, the other in Baltimore- where the interlocutors were sitting to transmit and receive their messages, the successful transaction of the message sent by Samuel Morse to Alfred Vail likely elicited raw and unadulterated emotion from everyone present. This message symbolized [58] the dawning of a new era in communication technology and the path to a new future. These ideas of progress were certainly likely to evoke joy, astonishment, pride, and even fear of the future and unknown, all because one message was sent and received.

Secondness [46] tendencies relate to how signs are interpreted from an indexical perspective. The ideas of indexicality [23] and secondness play a significant role in the interpretation of Morse code. First of all, like any messages, messages sent through telegraph can be interpreted based on their relation to circumstances in the world. In returning to the prospect of the first message sent and received, that which asked 'What hath God wrought?', the message can be interpreted to be asked in relation to the advent of the telegraph and new capability of communicating from thousands of miles away in a matter of seconds. This is a prime example of the indexical nature of the telegraph's progress in the world. The relation of dots and dashes to each other determines whether they belong to a single letter, or if they are part of individual letters, maybe even constituents of different words. Thus, when a person receiving a message in Morse code sees or hears the combination of three dots (...), each separated by a pause of one equal unit of time, they would interpret that sign [51] as being indicative of the letter 'S'. The positions of constituents in accordance with others determines the message that will be sent and received.

Thirdness [64] is a vital component of the interpretation of messages that are encoded in Morse. Many times, for the sake of efficiency and simplicity, messages in Morse Code are written in shorthand, with commonly used abbreviations spelled out to convey the message. A person would need to know these shorthand expressions, in addition to the code for each, in order to interpret them effectively. To go back to a previous example, the code SOS is an international distress signal that signifies that someone needs help. Despite popular belief, SOS does not stand for 'Save Our Ship' or 'Save Our Souls', but rather was devised as an easy and distinguishable message to remember and to translate. Again, the transcription for this message is '...---...'. Obviously, this code is something that is learned and which stands as a symbol [58] for something else. The

How Saussure Would View the Advent of Morse Code

French linguist Ferdinande de Saussure is one of the most prolific and influential names in the field of semiotics. His concept of the sign [53] is one of two today that are the most widely accepted and followed as what a sign is and what components are necessary for something to be classified as such. He devised a two-part model of a sign which can be used to apply to any form of sign, including those that are present in Morse Code. But, not only do the constituents of the code act as parts of a sign that can be explained in terms of Saussurean thinking, the history and circumstances for the development of Morse Code constitute a sign, one that signifies a time for change and innovation and new developments of ways to communicate with people over long distances. Another aspect of Saussure's work that applies to Morse Code is the concept of langue

[26] and the concept of parole [36]. These concepts return specifically to the library of meaningful combinations of dots and dashes that make up letters and words in the code.

As explored earlier, specific circumstances in the world led to the creation of the electric telegraph, and subsequently, Morse Code. If the principles of Saussure's theory of a sign were applied to the advent of Morse, the unreliability and inefficiency of other long-distance communication techniques would be recognized as the signifiers [56] that a new system of communication was urgently needed to keep up with the rapidly changing times. One of the most prominent signifiers that called for a new system of message transmission were the limitations that were present for early communication techniques such as smoke signals, drum beats, flags, and simply messengers on horseback to transmit messages over long distances (3, 8). Many of these communication methods were dependent on weather or other circumstances that would obscure vision of the signals [54] being sent, making them difficult to depend on. Likewise, it was hard to know if messengers got to their destinations or how long doing so would take.

 The second part of Saussure's binary model of a sign [53] would be identifiable in this example as the necessity of a new system of long-distance communication in the United States and world-wide. This dire need for a new communication technique would constitute the signified [55] because it is the idea in reference and the concept that the signified is ultimately leading to. In order for society and technology to progress, long-distance communication had to be upgraded and supportive of rapidly-changing needs and desires of the people.

The concept of langue [26] is another Saussurean idea which, this time, pertains to the actual code inherent to Morse Code. This concept encompasses the intricacies of a system and all of the constituent parts that contribute to it. It details what can and cannot be done in accordance with the system. In the case of Morse Code, langue would be present in all of the rules that constitute how encoded messages must be formed, including rules of dot and dash length as well as pause length. Giving the dot the length of one unit, and the dash three times the length of the dot is an integral part of the langue of Morse code, as is leaving the correct length pause between dots and dashes, letter codes, and words; one unit of pause between dots and dashes, three units between letters, and seven units between words (7, 8).

The concept of parole [36] is the counterpart of the aforementioned langue [26]. While langue entails the intricacies of the code that regulate how it is used and how all of the constituents work together, parole takes these rules and bits of abstract knowledge and focuses on how they are interconnected and are actually used to form the language as a whole. Simply put, parole is the concrete usage of language (7).

Jakobson's Functions of Communication Through Morse Messages

Just like any form of verbal or written communication, Morse Code utilizes all six functions of communication that were laid out by linguist Roman Jakobsen in the 1960s. Even though Morse Code does not use typical communication practices, these functions still apply and allow messages sent utilizing the code to convey emotion, have an impact on the receiver, state facts, deliver meaning iconically or poetically, establish communication, and relay information pertaining to the code itself (1).

In order for Morse Code to be enacted and used to create messages, an addresser must first initiate communication. This is a constituent necessary to communicate, and it correlates to Jakobson's emotive function [13] of communication. One of the most well-known examples of a Morse-coded message is S.O.S (...---...). As most people know, this is an international distress signal, sent out to ask for help and/or rescue (6). This is a perfect example of the emotive function of communication because the addresser has a clear intent of why the message is being sent.

The next constituent necessary for communication to take place is an addressee. This correlates to the conative function of language [3], in which the addresser's message has an intended effect on the receiver of the message. Returning to the encoded message …---... to explore this function, an obvious effect of this message on its receiver is to be concerned and want to provide help to the distressed addresser (1, 4).

The referential function of communication [43] pertains to any message that is constructed to convey information. Morse code encodes normal language and messages, thus any message that would normally be constructed and delivered by any other means of language can be delivered by Morse code. Although not explicitly stated in the message, S.O.S has the arbitrary connotation of sending the message 'I need help' (6).

Jakobson's fourth function of communication is the poetic function [38], which is any message constructed to deliver meanings iconically or poetically. This function is applicable to a specific and significant message sent in Morse code. The very first message ever sent using Samuel Morse's code via the telegraph was the biblical phrase "What hath God wrought?" (8). This message, in the context of the events, seems to be drawing attention to this new invention that would revolutionize the realm of communication as people knew it, said in a way that relates it to the circumstances yet not in a referential way, but rather by subtle and indirect reference (poetically).

The phatic function of communication [37] would be applicable to the telegraph and Morse code if a pair of interlocutors were to send messages of greeting to each other using the code (7). In

Morse Code shorthand, the greeting 'Hello' is signified by the syntagm [61] --- … … ---, which is also the number 73 (4).

The last function of communication which provides additional insight into the intricacies of the code is the metalingual function [27]. While not one that would be often applicable while using Morse Code, because one would have to know how to interpret Morse code in order to read the message in Morse code, it could still be done. This function, in Morse code, would appear in the form of a message that translates to, "A dash is 3x the length of a dot". This message explained a facet of the code in use, thus it carries out the metalingual function of language (7).

Conclusion

In this paper, my goal was to draw from semiotic phenomena to provide an in-depth discussion on an array of aspects surrounding Morse Code. This discussion did not focus solely on the physical code itself, but also the meaning inherent in the creation and evolution of the code and its implications throughout history and even today. The semiotic concepts put to use for the sake of this discussion are shown in the list below as an outline of what ideas were brought to light:

- The concepts of **signs** and the **biosphere** were discussed in relation to each other and in terms of cultural changes that were being made in the 1800s. The idea of **modernism** was discussed as the impetus for a new form of long-distance communication. In addition, **conceptual metaphor** and **image schema**
- The idea of **biosphere** was discussed in a new context, along with an exploration of **diachronicity**, to entertain a discussion of the dawn of the telegraph and its implications in an ever growing, ever changing world.
- The idea of **code** was briefly explained next to describe the constituents that come together to form Morse Code. The discussion began with the concepts of **syntagms** and **paradigms** which are central parts of Morse code. Another component discussed was the principle of **structural economy** and how the codes for each letter and number were chosen in terms of frequency of use to make transmission as efficient as possible. The **indexical** nature of Morse code was discussed finally as it relates to how the relationship of characters contributes to how the message is encoded and decoded.
- **Nonverbal communication**, through the lens of **gesture**, **kinesics**, and **proxemics**, were described next as being used in certain modes of delivery of the code, such as blinking, clapping, or using any other body mechanism to convey the dots and dashes. Also discussed were the ideas of **conventional signs** and **natural signs**.

- Roland Barthes' concept of **signifying order** was discussed next, along with the closely related idea of **denotation** and **connotation**. These are the two types of interpretation of signs.
- **Peirce's model of the sign** was explored next, touching upon the ideas of his triadic model of the sign which consists of a **representamen**, an **object**, and an **interpretant**. The discussion also delves into the qualities of **firstness**, **secondness**, and **thirdness**, some of which are blatantly present in Morse Code.
- **Saussure's model of the sign** follows, discussing his two-part model which consists of a **signifier** and a **signified.** The discussion relates the concepts to the letter/symbol relationship as well as the idea that changing needs in the world was a sign that new progress should be achieved. **Langue** and **parole** were also explored as encompassing Morse Code as a form of language that a person must know in order to effectively convey ideas in the language.
- Roman Jakobson's six functions of communication - the **emotive**, **conative**, **referential**, **poetic**, **phatic**, and **metalingual functions** - were defined, exemplified, and applied to the communication that takes place when messages are sent and received through telegraph by means of Morse Code.

This paper is an example of how semiotic studies apply to seemingly unrelated domains, but yet can provide immense insight into the intricacies and inner workings of that domain, and can even lead to a heightened understanding and appreciation of that domain.