

Chapter 20: Coding of non-text data

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Biography

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Abstract

This chapter overviews the domain of “non-text” data that can be found on social media, such as videos and photographs. It then outlines research methods that can be applied to analysing and coding these non-text documents and their associated texts. These methods include compositional interpretation, quantitative content analysis, qualitative content analysis, and approaches related to content analysis such as document analysis and musical analysis.

Analysis methods influenced by cultural understandings stem from the disciplines of cultural studies, visual sociology, visual anthropology, semiotic analysis, and iconography/iconology. Finally, analyses influenced by social understandings involve discourse analysis, visual social semiotics, and multimodal research. The chapter concludes with a call for future development of methods specific to non-text data to continue advancing research in this emerging and essential area of social science.

Introduction

Non-text data possesses the unfortunate disposition of being described as what it is *not* rather than what it *is*. The non-text domain is defined as a wide range of formats which encompasses everything but language-based text, such as photographs, films, music, diagrams, charts, video games, paintings, and maps, all of which can be found in abundance online (Rasmussen Neal, 2012). The exponentially-growing presence of non-text documents on popular social media outlets such as Facebook, Twitter, Instagram, Flickr, Pinterest, Snapchat, YouTube, and Vine has created an opportunity for social science researchers to understand the products of digital society through analysing this data in many formats. Like almost all social media content, non-text social media posts are naturalistic. In other words, social media users post, share, and discuss items and topics of interest to them in their own settings and on their own terms rather than in a controlled setting, thus avoiding any potential Hawthorne effect on their interactions (Adair, 1984). Since they are posted online, rich data sources such as user-generated photographs and videos can be viewed, paused, and played back as many times as necessary in order to maximize the potential of the researcher's analysis (Gibson, 2008).

Computer and information scientists attempt to automatically extract non-text data for quantitative or algorithmic analysis (Rorvig, 1993; Downie, 2003). These techniques have not yet succeeded in identifying or communicating the interpretive, connotative meanings that are important to social scientists; therefore, this chapter focuses primarily on qualitative approaches. Researchers can think of non-text social media data as found documents, just as they would view photographs in a newspaper's print archive as found documents. Also, due to the prolific social interactions that take place on social media websites, they can also observe how people interact with each other and with documents posted online (Markham, 2008). For example, a user-generated music video on YouTube can provide insight into how the creators of the video portrayed themselves, their surroundings, and the music. The viewers' comments on the video can help researchers understand the culture surrounding the video, viewers' opinions of the video, and the affective and intertextual features that are important to a given fan community (Rasmussen Pennington, in review). Researchers have been studying the psychological and sociological impact on users who interact with non-text documents on social media. In one study, 75% of young people aged 18-29 said they posted photos on Facebook. Viewing their friends' Facebook photos caused them to feel self-conscious about their bodies (Hayes, van Stolk-Cooke, and Muench, 2015).

The continuously growing number of non-text documents shared on social media demonstrates the opportunity and the need for social science researchers to make use of these artefacts. For example, the photograph sharing website Flickr has 115 million users (Flickr, 2015), 300 million photographs are uploaded to Facebook daily (Zephoria, 2015), and 8,333 videos are uploaded every minute to the video sharing website Vine (Smith, 2015a). In 2014, 26% of online adults used Instagram, and 28% of them used Pinterest; both of these websites

centre on photograph sharing (Pew Research Center, 2014). Society can only expect these numbers to continue increasing, as they have since the inception of Web 2.0.

Despite these proliferations, very few methods have been developed specifically for analysing non-text social media data, or for non-text data in general. Content-rich, non-text documents such as photographs and videos have historically been overlooked due to the high priority that textual language holds in social science research (Bauer, 2000, p. 278). However, “[L]anguage is not at all at the centre of all communication” (Iedema, 2003, p. 39), so it is useful to incorporate documents that exist in a range of formats as research data. Pauwels (2011) stated, “social scientists are well-prepared to derive valuable knowledge from sources other than verbal or numeric” (p. 573), but he also stressed that social scientists are lacking in research tools to create this knowledge. Visual data is perhaps more complex to decipher than printed text, but both are necessary and one informs the other. Van Leeuwen (2008) described the relationship as follows: “words provide the facts, the explanations ... images provide interpretations, ideologically colored angles, and they do so not explicitly, but by suggestion, by connotation, by appealing to barely conscious, half-forgotten knowledge (Berger, 1972)” (van Leeuwen, 2008, p. 136).

Standard social science analysis methods can be applied to non-text data, but they require slightly different approaches. The subjective nature of interpreting non-text documents is a unique concern to qualitative social scientists because their concrete, denotative elements are not easily extracted as they are in text-based documents (Svenonius, 1994). Keywords and subjects can be directly pulled out of a textual document, but in order to find the subject of a photograph or a video, researchers must either locate the associated caption, title, or description, or assign a denotation based on their own analysis. As this chapter will

demonstrate, it is sometimes useful to analyse non-text documents such as photographs in conjunction with their associated textual counterparts. Photographs are not words, and words are not photographs. While ideas can get lost in translation between the two modes of communication, each provides something different and complementary to the viewer (O'Connor and Wyatt, 2004; Neal, 2010a). Neal (2010a) referred to a photograph and its associated tags, captions, descriptions, and viewer comments that are posted on a social media website as a “photographic document” because the text and the image work together to create meaning (Lemke, 2002).

For example, imagine a couple has posted photographs of their Caribbean honeymoon on a social media website. The pictures will connote different meanings for the couple than they will for their friends and family, and friends and family will interpret them differently than strangers will. The couple knows without looking at the photos' associated textual descriptions that the pictures represent their honeymoon, and the photos help them recall how they felt and what they did when they were there. Friends and family will remember attending the wedding, and they will easily recognize the couple in the photos, but they will not be able to associate the same memories with the photographs because they did not take the trip. If the photos are marked as public on their social media website, anyone can view them. Members of the general public will see a couple enjoying a beach, but they would not know exactly who the people are. They also would not know that the photos represented a honeymoon, or that they were in the Caribbean, without reading the associated tags or captions.

Some non-text research requires active engagement from participants, such as photo elicitation, in which participants are shown photos and are asked to discuss their content and

meaning (Collier, 2001). Photovoice is a method in which participants are asked to take pictures on the topic of the research and they are then interviewed about their photographs (Watson and Douglas, 2012). Other non-text studies are performed using researcher-created data, such as video recordings shot during live observation (Banks, 2007). The practice of ethnomethodology, which studies conversations and how people interact socially, can benefit from using video recordings because ethnomethodologists can not only transcribe the dialogue, but they can also observe non-verbal communication (Goodwin, 2001; Banks, 2007; Ball and Smith, 2011).

Since this focus of this handbook is social media research methods, this chapter will summarize approaches that can be used to analyse non-text social media data, which are “found” or pre-existing documents. These approaches can be used in a variety of disciplines. According to Banks (2007), analysing found images “is generally practiced by scholars in the fields of communication studies, cultural and media studies, and information design, although sociologists, anthropologists, and others have also contributed” (p. 37).

When designing a non-text study, the following overarching questions must be answered:

- **Theoretical approach:** What theoretical approach and analysis method will be used? Banks (2007) recommended choosing the theoretical approach and the method of analysis before finding data.
- **Data identification:** What types of documents will be analysed? For example, are they still images (photographs) or moving images (videos)? In part, the form dictates what information can be gathered from the data (Banks, 2007). For example, a video can demonstrate sequential actions, while a photograph can capture only a single instant in time.

- **Scope or boundaries:** What exactly will be included in the analysis? A study comprised of only visual analysis will enable the researcher to look at the images or videos, but will not incorporate the context that accompanying text can provide (van Leeuwen and Jewitt, 2001).
- **Unit of analysis:** What is the unit of analysis? Comparing and contrasting dog photographs with cat photographs would require using a collection of images as the unit of analysis. Conversely, looking at how happiness is conveyed in photographs would call for an individual image as the unit of analysis (van Leeuwen and Jewitt, 2001; Neal, 2010a).

This introduction has overviewed the domain of “non-text” data that can be found on social media, such as videos and photographs. The chapter will next outline research methods that can be applied to analysing and coding these non-text documents and their associated texts. They are listed in Table 20.1. The methods include compositional interpretation, quantitative content analysis, qualitative content analysis, approaches related to content analysis such as document analysis and videography, and musical analysis. Analysis methods influenced by cultural understandings stem from the disciplines of cultural studies, visual sociology, visual anthropology, semiotic analysis, and iconography/iconology. Finally, analyses influenced by social understandings involve discourse analysis, visual social semiotics, and multimodal research. The chapter concludes with a call for future development of methods specific to non-text data to continue advancing research in this emerging and essential area of social science.

[Table 20.1 near here]

Compositional interpretation

Before embarking on one of the analysis methods described later in this chapter that incorporate surrounding cultural and social contexts and other elements into non-text analysis, it could prove useful to first perform what Rose (2012) calls “compositional interpretation” (p. 51), which is concerned with the appearance of an image on its own. While this method primarily applies to paintings, it can be applied to any visual image, including photographs, films, and the socially-oriented Massive Multiplayer Online Role Playing Games (MMORPGs), which contain a practically infinite number of images. Rose (2012) suggested looking at content, colour (hue, saturation, and value), spatial organisation (the geometrical perspectives of the image’s layout), film editing, and the image’s affective expression. For example, in Figure 20.1, the author’s photograph of one of her dogs enjoying the water communicates a happy, joyous feeling when the viewer looks at her blissful face. When the author posted this photograph on her Facebook account, she received comments from her friends such as “Happy dogs make life worthwhile!” “She’s smiling!” “Happy dog!” and “That pic is so epic lol”. These comments validate the compositional interpretation that the author would have applied to it. Other research by the author (Neal, 2010a; Neal, 2010b) has shown that pets and smiling faces are two items that are associated with Flickr photographs tagged with the word “happy”.

[Figure 20.1 near here]

Content analysis

Content analysis, which allows researchers to classify their data into meaningful categorisations, can be performed either quantitatively or qualitatively. An overview of each type follows.

Quantitative content analysis

In some cases, content analysis is positivist and quantitative, and the aim is to be as objective as possible. When performing quantitative content analysis, researchers count the manifest, denotative content that is under scrutiny, which is what makes it quantitative in nature. The researcher provides a list of codes to two or more coders, and the coders are asked to code the data in the same fashion, which hopefully leads to reliability in the study. It can be used to analyse any type of data that can be observed concretely (Bell, 2001; Banks, 2007). Banks (2007) explained that in content analysis of film, the researcher can also code for elements unique to moving images, such as video editing, dialogue, and background music.

Imagine that a researcher is investigating what types of photographs people post of their pets. A sample of 100 pet photographs could be collected by searching for “pets” on Flickr or another photograph-sharing website. The unit of analysis would be each image. One variable might be “type of pet” and possible values might be “dog”, “cat”, “bird”, and “fish”. Another variable could be “humans in photograph” and the values could be “0”, “1”, “2”, and “3 or more”. The results might find that in the sample, there were 42 dog pictures, 37 cat pictures, 12 bird pictures, and 9 fish pictures. Seventy-six pictures had no humans present, 17 had one human, and 7 had two humans. This study would obtain reliable results if the coders have received applicable codes and appropriately detailed instructions. However, this approach to studying images cannot answer questions about the context or environment surrounding the pictures, and it cannot incorporate the thoughts of the creators or the viewers (Bell, 2001). Additionally, analysing the content of a still image, such as a painting or photograph, using quantitative content analysis might define what the picture is *of*, but it will not tell the researcher what it is *about* (Shatford, 1986). While content analysis can be applied to a wide

range of data types, some types are specifically designed for the purpose of studying non-textual documents, such as videography.

Rose (2000) outlined another approach to using content analysis for video. She developed the method for television originally, but it can be applied to any video containing social interactions. The transcription includes not only the verbal dialogue, but also elements such as the angle of the camera, lighting, and music that correspond in time to the dialogue. Next, “[d]evelop a coding frame based on the conceptual analysis and preliminary reading of the data set: to include rules for the analysis of both visual and verbal material; to contain the possibility of disconfirming the theory; to include analysis of narrative structure and context as well as semantic categories” (p. 261). The videos are then coded using the coding frame, and frequency tables are created for both the visual and verbal units of analysis. Rose (2000) emphasized the importance of using quotations to enhance the numerical results.

Other sources can be consulted in order to learn more about the quantitative content analysis process in general (Krippendorff, 1980). Rose (2012) provided a description of the process as it applies to images. After finding the images to analyse using an appropriate sampling strategy, create a list of codes to be applied; codes should be exhaustive, exclusive, and useful. Coders can record what codes they have assigned to each image in a spreadsheet, in data analysis software, or on index cards. Frequency counts are then produced from the coding results.

Qualitative content analysis

Content analysis was originally developed as a quantitative analysis method, but it can also be performed qualitatively. While quantitative content analysis can answer “what” questions,

qualitative content analysis can answer “why” questions as well as investigate perceptions (Julien, 2001, p. 121). It is traditionally applied to text, but it can be used with visual data such as videos and pictures. When applying qualitative content analysis to photographs, “the researcher may identify content as straightforwardly as identifying objects evident in photographs or may conduct more subtle analyses of symbolic communications that can be unconsciously determined from a physical space” (Julien, 2001, p. 121).

When performing qualitative content analysis, the codes or themes are produced through inductively analysing the data in detail (Julien, 2001). The codes can represent categories that exist at a surface level, such as what is physically present in a picture, or they can reflect deeper levels of meaning, such as symbolic or connotative meanings. Performing iterations of analysis, and using more than one coder to complete it, creates its credibility. According to Julien (2001), a 60% level of agreement between two coders is considered an acceptable level of agreement in qualitative content analysis. Mayring (2000) provides a detailed explanation of how to approach content analysis inductively and iteratively.

Document analysis

Document analysis, an analysis method in which existing documents are the data source rather than elicited data such as interview transcripts, is frequently performed using qualitative content analysis such as thematic coding and grounded theory. It can also involve quantitative content analysis or discourse analysis (Prior, 2008; Bowen, 2009). The documents to be analysed can be in text or non-text format, such as video, audio, maps, and photographs (Prior, 2008; Saumure and Given, 2008). Existing documents such as items that have already been shared on social media are an unobtrusive data source for social scientists, because they do not have to ask people to participate or answer questions (Prior, 2008). With

document analysis, researchers can look at “how individuals experience life events” (Saumure and Given, 2008, p. 927). For example, Instagram photographs could be analysed to develop themes around how youth communicate the events in their daily lives to their followers based on the photographs they shoot and share.

Videography

Videography, defined as “the interpretive video analysis of social interaction” (Knoblauch and Tuma, 2011, p. 427), is a form of content analysis that is used in naturalistic settings. Videographers start their research process by finding video clips of interest through ethnographic approaches. Clips are coded iteratively using an approach similar to grounded theory (Strauss and Corbin, 1998). Codes are first informed by pre-existing knowledge, such as ethnographic data. Later codes make use of the deeper sequential analysis performed throughout the study, such as transcripts of the videos and the order in which visually observable physical action takes place (Knoblauch and Tuma, 2011). The focus of the camera, and the order in which things happen in the clips, are important for coding and interpretation. Other methods, such as observation and interviews, are used to gain relevant contextual knowledge that also informs coding. It is possible to imagine using videography with many different user-generated found videos, including family interaction and classroom participation. With the 300 hours of video content that is uploaded per minute to YouTube, a range of user-generated video content is available for researchers to analyse (Smith, 2015b).

Musical analysis

Music by itself must be considered separately from other types of documents because it cannot be analysed in the same way. This is largely due to the fact that music has very little connotation on its own; in other words, it holds little meaning itself apart from the meaning

that its listeners attach to it, such as nostalgia or happiness. As Bauer (2000) questioned, “The status of music is controversial: can music carry meaning on its own, or only in conjunction with images or language?” (p. 278).

Very little has been written about the use of music in social media research, although it should take priority, because music is an essential component of the human sociocultural experience (Bresler, 2008). According to Bresler, the “sociology of music” incorporates sociological research approaches “to examine the role of music in society and to study music behaviour and attitudes as part of social action” (p. 535). Whether people are sharing links to music videos by their favourite artists, creating their own music to share with others, or commenting on shared music, their posts can provide perspectives about cultures and opinions. Ethnomusicology is a method that helps researchers understand the role that music plays in a particular culture (Nettl, 1983). Additionally, music creates a significant emotional impact on people (Juslin and Sloboda, 2010; Rasmussen Pennington, in review). It can change how people react to visual documents such as film (Bravo, 2014). Interplay frequently exists between music and associated images, such as in the case of music videos; this interplay can influence meaning (Cook, 1998; Vernallis, 2013; Werner, 2014). For these reasons, it is important to not discount music as a data source.

Bauer (2000) provides a process for finding social and cultural meaning in music. First, transcribe the music in a way that makes sense for the research, such as standard Western music notation or “acoustic cues” (Juslin and Laukka, 2003, p. 770). Next, keeping in mind that music holds more denotation than connotation, look for meaning in the music. It may exist in internal, intertextual references to other music, or it could be found externally, such as in a reminder of the listener’s past memories. Bauer explains how to analyse musical

features, including its melody, harmony, dynamics, form, and orchestration, to characterise music, and he shows how each feature can express intangible qualities such as cultural information (Bauer, 2000).

Neal et al. (2009) used qualitative content analysis to explore how users of the music website last.fm tag emotion in music. They examined the musical features present in songs that were frequently tagged with each of the five basic emotions proposed by Power (2006): happy, sad, anger, disgust, and fear. Songs tagged with “Happy” elicited the highest level of agreement among the coders, especially on the “Pitch” and “Temporal” musical facets. The researchers questioned whether other emotions, and other musical features, prompted a high enough level of agreement among the coders to be able to say that there is a universality present in how people denote music. More exploration in this area is needed; the results were inconclusive.

Non-text analysis methods influenced by culture

A variety of disciplines offer methods for analysing non-text documents that take cultural influences into account. These disciplines include cultural studies, sociology, anthropology, and semiotics. The methods are discussed in detail in this section. This section should be considered in tandem with the following section on methods incorporating social influences, because social and cultural influences frequently exist together. The distinction is made in this chapter for grounding the reader’s understanding in the predominant influence present in each method.

A cultural studies approach

Lister and Wells (2001) discuss the application of approaches from the cultural studies field, which “is interested in the enabling and regulating institutions, and less formal social

arrangements, in and through which culture is produced, enacted and consumed” (p. 61) to analysing images. Cultural studies researchers look for the relationship between cultural production and social practices, which can be readily studied through images created by members of the culture. The first step in the process of analysis is to consider the context of the viewing: determine where the image exists socially and physically, and why a consumer might be looking at the image. For example, when people post photographs on social media, they intend for their friends to see them, and their friends will look at the photos if they want to find out what is happening in their lives. Next, analyse the context of production: how did the image get there? In most cases involving social media, this answer will be quite simple: the person or institution holding the account posted it.

When analysing the image itself, consider its semiotics (discussed later in this section). In the case of photographs, look at the composition of the image, such as how it was framed, the gaze of any people in it, the camera’s position, and the background. These comprise the “photographic code ... A set of signs that, taken together, means something to us” (Lister and Wells, 2001, p. 76). Visual elements in a photograph, including how people are dressed, body language, and inanimate objects present in the image provide social clues about the context of the image; for example, what can be learned about people in a picture if they are smiling, gathered around a tree, and wearing winter clothing?

Lister and Wells (2001) acknowledged that cultural studies is not prescriptive in its method of analysis; rather, it holds strengths in using a variety of methods and in encouraging researchers to draw on their individual experiences. They pointed out how “photographs are often treated as if they were a source of objective and disinterested facts, rather than as complexly coded cultural artefacts” (p. 89). It is, therefore, up to the researcher to learn how

to decode photos in order to understand the social and cultural contexts in which a photo was shot.

Visual sociology and visual anthropology approaches

Pauwels (2012) provided a framework for performing research in visual sociology and visual anthropology, which “are grounded in the idea that valid scientific insight in society can be acquired by observing, analyzing, and theorizing its visual manifestations: behavior of people and material products of culture” (p. 179). Found images, such as the ones a researcher would collect on social media websites, will communicate historical, social, and cultural information of both the photographer and the viewers, but it may not be possible to learn the history of the images because the photographer is not present to discuss it. In visual sociology and visual anthropology, researchers should look at what is depicted as well as how objects are represented. Despite this unique approach, Pauwels (2012) insisted that visual research should not be treated as a specialized type of sociological research, but rather as an approach that influences the entire research process.

While Pauwels (2012) covered the framework, Collier (2001) outlined the specific steps in how to perform a study using visual anthropology. In what he called “direct analysis”, the researcher uses the content of images as data. First, look at the dataset as a whole and write down the feelings, impressions, and questions that come to mind. Next, log all the images and consider categorising them if necessary. Then structure the analysis, answer specific questions, conduct statistical analysis as appropriate, and describe them. Finally, return to the dataset as a whole and write the conclusions. Collier (2001) noted the value in comparing images side by side within each step in this process. Direct analysis can also be used with sound and with video.

For example, imagine researchers performing direct analysis on a set of Twitter photographs and videos posted by attendees of a rock concert. The researchers want to learn more about the fan culture of the particular band. Viewing all the items located that were shot at the concert can provide an overview of what the concert experience was like generally, such as an anxiously excited audience, a crowded stadium, and long lines for purchasing refreshments. The overview should then be written down. Then, each image and video might then be viewed individually to determine what aspect of the concert it portrays, such as the band's performance, fans' behaviours toward the band, and interactions between fans. Next, the researchers could then answer their research question about the fan community and culture by comparing each document to one another, describing the set of visual documents qualitatively through description, and describing the set quantitatively through statistics. The answers to the research questions and the discussion can then be written.

Semiotic analysis

Semiology, or the study of signs, leads to “detailed accounts of the exact ways the meanings of an image are produced through that image” (Rose, 2012, p. 106). Semiological analysis focuses on the image itself as well as the composition of the image, since the composition of the image contains the signs. Semiotic studies are used for “approaching sign systems systematically in order to discover how they produce meaning” (Penn, 2000, p. 227). In pictorial semiotics, “pictures are signs” (Nöth, 2011, p. 300).

In semiotics, a sign is the most basic level of language, and a sign contains two parts: the signified, which can be an abstract or concrete idea or object (“a furry, four-legged animal that loves humans”) and the signifier, a word or image that is connected to the signified

(“dog”) (Saussure, 1966). Semiotics is used frequently in advertising to sell products.

Looking at humans as signs in advertisements can help researchers understand how signs are used to communicate symbols, such as an attractive man’s face in an advertisement for male skin care products. Advertisements frequently involve signified stereotypes that audiences are accustomed to interpreting, such as a mother serving a presumably healthy and delicious breakfast to her smiling son.

There are several philosophical models for describing types of signs, but perhaps the most useful model for thinking about signs in social media documents is that of Barthes (Barthes, 1967; 1973; 1977; Penn, 2000; van Leeuwen, 2001). According to his approach, a sign’s denotation, or a simple description of what the sign is picturing, is easy to decode and requires limited knowledge. For example, a woman wearing a wedding dress is a bride. The diegesis is everything that is denoted in the image, such as “a man wearing a tuxedo standing next to a woman wearing a white veil and an elaborate white dress.” Anchorage is the text that accompanies the image and may clarify the denotation for viewers, such as a Facebook comment stating, “Here we are right after the ceremony and on our way to the reception together, as Mr. and Mrs. for the very first time!” Barthes calls this function of the text a relay-function. A connotation of the image, or its higher and more abstract levels of meaning, requires cultural knowledge. A connotation can be metonymic, which associates the picture with something else (a wedding photo connotes love, for example), or synecdochal, in which one part of something communicates something else (a gold ring, which is part of a wedding, connotes marriage). Barthes called the denotation a first-level semiological system, and the connotation a second-level semiological system. Myth, according to Barthes, is a second-level signification; it is “the means by which a culture naturalizes, or renders invisible, its own norms and ideology” (Penn, 2000, p. 231).

Barthes believed that a photograph “always carries its referent with itself” (Barthes, 1982, p. 5) in a way that other images do not because a photograph is so close to what it represents. He defined two methods for interpreting a photograph: a studium is an educated, informed viewing and interpretation of a photo, while a punctum speaks loudly to a viewer in unintended ways: “while the studium is ultimately always coded, a punctum is not” (Barthes, 1982, p. 51). A punctum typically relates to an emotional reaction to a photograph, so it can be difficult to translate it into a textual description. For example, the author of this chapter has a photo of her late father that holds a punctum for her. When she views it, she thinks about fun times she had with him, how much she loved him, and how devastating it was to watch him decline and pass away at a young age due to dementia. Social media sites tend to be places where people can express their feelings surrounding grief and loss of loved ones (Carroll and Landry, 2010). The author’s father was never active on social media, so she cannot post on his profile pages. However, she makes that special photo of him her profile picture on significant anniversaries, such as his birthday and the day he passed away.

Penn (2000) described the steps to undertake when performing semiotic analysis. The goal is to find and explain the cultural knowledge that the viewer must understand in the image. First, choose the images, keeping in mind that semiological studies do not utilize statistically representative sampling (as is done in quantitative content analysis); instead, they provide detailed analysis of a few related and purposively selected images. Next, list what is denoted in the image as well as in any associated text. Thirdly, find the connotation or myth in the image by looking at each denotative portion of the image and determining what cultural knowledge it represents. Consider syntagm, or how all the elements relate to each other. After the research question has been answered and all possible denotational relationships

have been considered, present the findings for each level of signification in a narration or in a table.

For example, perhaps a researcher wants to learn about what cultural knowledge people from other countries think about when they see photographs of Scotland. Consider the photograph in Figure 20.2. The author took this picture in Glencoe, a region of the Scottish Highlands. She posted this picture and a few other pictures of Glencoe on her Facebook page. She simply labelled each one “Glencoe.” A friend commented on it: “Where's the piper? When I went to Glencoe there was someone in a kilt playing the bagpipes 😊”. If researchers included this photograph in a collection of Scottish cultural images for semiotic analysis, they might first list items directly observable in the image, such as “hills”, “waterfall”, “rocks”, “green grass”, the photographer’s description of “Glencoe”, and the friend’s comment about the bagpipes. At the connotative level, this natural scene of the Scottish Highlands could be said to represent the stereotypical cultural traditions of Scotland, such as kilts and bagpipes, as expressed denotatively through the textual description, the comment, and the hilly, green content of the image. Perhaps the photograph’s connection to Scotland could not be made without the syntagm, or the relationship between the textual and the visual elements.

[Figure 20.2 near here]

Iconography/iconology

Iconography is a method of determining meaning in an image. It has been described as “a qualitative method of visual content analysis and interpretation, influenced by cultural traditions and guided by research interests originating both in the humanities and social sciences” (Müller, 2011, p. 285). It is somewhat related to Barthes’ visual semiotics in that

they both investigate levels of meaning in a visual image. Panofsky (1955) provided three levels of meaning in pictures within his discussion of iconography. While he applied it to art history, it can be applied to any image. The first level, pre-iconographical description, is simply an explanation of what is in the picture. This level, described as the “primary or natural subject matter” (Panofsky, 1955, p. 40), is similar to Barthes’ notion of denotation (van Leeuwen, 2001). Panofsky noted that it can be difficult to denote the subject matter if practical experience has not prepared the researcher for recognizing the representation. Van Leeuwen (2001) suggested trying to identify what is in the image by looking at the title, referring to personal experience, doing background research, considering intertextuality, or reading the image’s verbal description. The second level, iconographical analysis, denotes not only the specific people or items signified in the image, but also the ideas, or the “secondary or conventional subject matter” (van Leeuwen, 2001, p. 40), attached to it. Iconography requires a certain amount of cultural knowledge; to cite Panofsky’s example, not everyone would see a painting of the Last Supper and realize that it connoted something more than a dinner party. The third and highest level, iconological analysis, is “intrinsic meaning or content, constituting the world of ‘symbolical’ values” (van Leeuwen, 2001, p. 40). It is the most subjective and the most difficult to determine of the three levels, and may include viewers’ interpretations that the creator of the image did not intend.

Müller (2011) provided guidelines for performing an iconographical/iconological analysis. First, begin research by collecting images and writing a research question. Classify the images, perhaps by their pre-iconographic description at first. Look for images that are prototypical for the research, and describe them. Compare them with one another. To complete the higher levels of analysis, examine both visual and textual information that can possibly attribute meaning to the images. Consider the form (for example, photographs

posted on Instagram), and think about how the production as well as the consumption of the images could create or influence their meaning. Finally, determine what “the studied visuals convey about the social, political, and cultural context in which they were produced and perceived” (Müller, 2011, p. 294).

Müller provided the example of American presidential campaigns to illustrate the steps in a visual iconological analysis. First collect the photos or videos that relate to the campaign; she uses press photos and debate footage as examples, but these could also come from social media posts. Next, reference the information about the items, such as the photographer’s name and the time of publication. Ensure that the research question can fit into an iconographical approach. The three steps in the analysis should be as follows:

1. Describe the content of the images in a neutral way (pre-iconographical). For example, “Barack Obama talks about education to a group of university students and faculty.” “Hillary Clinton discusses her plans for health care reform to a group of supporters in Virginia.” “John McCain outlines Sarah Palin’s qualifications for the position of Vice President to Republican voters.”
2. Create categories that reflect the images in the study (iconographical). Categories might include “speeches”, “health care”, “education”, or “running mate”.
3. Situate the images within the social, political, and cultural contexts of their point in time. “Ideally, the iconological method will enhance the understanding of the subtle messages and ideas conveyed through the visual presentations of the candidates, and thus implicitly allow identification of the expectations raised by the winning candidate on which his or her presidency will be tested” (Müller, 2011, p. 290). For example, in the 2008 American

presidential election, one strength in Obama's campaign was his ability to deliver powerful speeches with which Americans connected (Lister, 2008).

Non-text analysis methods influenced by social understandings

Methods for non-text analysis that have social influences, including discourse analysis, visual social semiotics, and multimodal research are discussed in this section. As noted previously, social and cultural impacts do not exist in their own silos; one frequently forms the other.

Discourse analysis

Discourse analysis has many different theoretical and practical underpinnings which cannot all be covered in this chapter. Potter (2008) defined it as “a cluster of related methods for studying language use and its role in social life” (p. 112). Historically, it has been used to study textual language, such as interview transcripts, but discourse analysis is an increasingly popular practice in studies involving non-text documents (Iedema, 2003; Clark, 2008; van Leeuwen, 2008; Neal, 2010a ; Vernallis, 2013; Werner, 2014; Rasmussen Pennington, in review).

Without linguistic transcripts to examine closely for discourses, different social cues must be examined in a film or a still image. Van Leeuwen (2008) described his methods in performing a visual critical discourse analysis. He watches a document to find out how people are depicted and how the viewer is related to the depicted. He includes three dimensions: “the social distance between depicted people and the viewer, the social relation between depicted people and the viewer, and the social interaction between depicted people and the viewer” (van Leeuwen, 2008, p. 138). For example, people who are shown in a close-up image are shown to the viewer to be “one of us”, while people who appear far away from the camera are “strangers”.

Discourse analysis is particularly concerned with the role of social interactions in constructing meaning. Also central to creating discourses is intertextuality: how does the meaning of a document depend on meanings of other related documents? For example, in Rasmussen Pennington's (in review) study of user-created videos featuring U2's "Song for Someone", many producers made references to other U2 songs, U2 concerts, books about U2, and presented mashups of other U2 songs in their videos. For example, one producer commented in her description, "I'm the singer-songwriter who was pulled on stage during U2's Elevation tour in Las Vegas to sing and jam with my heros [sic]!" U2 paraphernalia appeared in the videos, such as a poster hanging on the wall containing the cover of the band's *Achtung Baby* album. Some producers dressed like members of the band, such as a singer who was wearing an earring, sunglasses, and black clothing that appeared very similar to how Bono (U2's singer) dresses. This illustrates the importance of learning as much as possible about the subject of interest in a study when examining how discourses are constructed.

When performing discourse analysis of visual materials, view the documents multiple times while beginning to find obvious key themes. Consider how meaning is assigned to the images or words. For example, in Werner's (2012) study of YouTube videos in which girls danced like Beyoncé, the girls intertextually alluded to a range of past videos using imitation, parody, similar dress, and similar dance moves, which constructed social discourses about race and gender. Throughout the interpretation process, continue to examine the documents in detail, and refine the themes as they are developed. The discourse analysis process is not as rigid as the development of codes in content analysis, so themes will evolve throughout the research (Rose, 2012). Examine the social influence on the production, content, and consumption of

the images. Producers of social media documents tend to be concerned with how their potential audience will receive their creations, so they are likely conscious of potential social reception (McCay-Peet and Quan-Haase, 2016). Additionally, the element of consumption can be quite prominent in social media posts due to the ubiquity of commenting, liking, disliking, and sharing them.

Visual social semiotics and multimodal research

Visual social semiotics and multimodal research are closely linked approaches that also relate to discourse analysis. Perhaps it could be said that they are first steps in developing research methods that are designed specifically to analyse non-text data.

Visual social semiotics. Visual social semiotics is an approach to semiotics that focuses on the audience's reception to the image and how the meaning of an image is socially created (Rose, 2012). Jewitt and Oyama (2001) provided an example of a print-based cartoon featuring naked young men and their internal thoughts about their interest in sexual activity. The only one who is wondering why he is not interested in sex is visually depicted as an "other" by means of "his unbalanced posture, 'limp wrist', foppish hair and glasses: he represents 'wimp'" (Jewitt and Oyama, 2001, p. 138). The authors provided this example to demonstrate how visual cues can be used as a representational "syntax" that creates meaning for the viewer.

Iedema (2001) performed visual social semiotic analysis on a documentary film, and identified six levels of analysis in film, from lowest to highest level: frame, shot, scene, sequence, generic stage, and work as a whole. Jewitt and Oyama (2001) presented three different types of simultaneously occurring meaning that can be observed through visual

social semiotics. Representational meaning is communicated through what is depicted in the picture, either by actions of the people in the picture or by concepts in the picture. Interactive meaning is conveyed by the relationship between who or what is in the picture and the viewer; this tells the viewer how the image should be viewed. Compositional meaning is created through value communicated by physical placement in the image, physical contrast between items depicted in the image, or other compositional elements.

Multimodal research. The terms “social semiotic research” and “multimodal research” are sometimes used interchangeably (Rose, 2012). Driven by the increase in the number of images, films, and other non-text documents in the media and online, the term “multimodality” was initiated in an attempt to encourage researchers to incorporate non-text documents into semiotic research. Multimodal research lifts the traditional language-only restriction and “provides the means to describe a practice or representation in all its semiotic capacity in richness” (Iedema, 2003, p. 39). According to Iedema (2003), multimodal research is a discourse analytical practice that can expand the identification of discourses through the analysis of multiple modes. This is an important approach for social media; when people are online, they tend to interact with more than one document at a time, and many of these documents are likely non-textual (Markham, 2008; Rasmussen Neal, 2012). Additionally, different parts of a social media document work together to create and communicate meaning, such as pictures and words (Neal, 2010a) as well as music and images (Vernallis, 2014).

On the Internet, images, sounds, written language, videos, and other formats are all considered part of a text, and all are worthy of analysis. Visual elements, including facial expressions, colours, and movement, as well as music, become interlinked data in

multimodality. In transcribing multimodal documents, all these elements should be present at a level of detail necessitated by the research question. They could be presented in a “transcript” that is actually a table containing these multiple elements. For example, in transcribing a video, the people present, their physical actions, words spoken, and facial expressions could be described at relevant time intervals. Multimodal transcriptions can include textual as well as non-textual descriptions (Flewitt et al., 2012). For example, imagine transcribing a YouTube video that shows a family interacting with each other in a park. Researchers could note not only what the family members said to each other, but also details about what they did (3:54 – mother hands a cup of ice to daughter), nonverbal communication (3:56 – daughter rolls her eyes at mother), screen shots of frames taken at regular intervals or at significant points (screen shot of toddler beginning to scream at 4:35), and sounds (a sound clip of the song that daughter was singing along with at 2:00-2:17).

Van Leeuwen (2011) asserted that multimodal analysis should not be limited to looking at images because today’s technologies allow visual design elements such as colours, typefaces, and spatial layouts to communicate meaning. He discussed how writing on websites and presentation slides are both word-oriented and image-oriented, “and they hang together, not as webs of words, but as multimodal compositions” (p. 568). Additionally, since people do not read text in a sequential or linear fashion online, online text takes on a spatial element as well (van Leeuwen, 2011). The communicative nature of these multiple modes adds layers of meaning to web documents (Mautner, 2012). Mautner (2012), in a discussion about using multimodal discourse analysis on web-based documents, pointed out how intertextuality is an inherent property of hypertext, since hyperlinks send people to related websites. This property reflects the very nature of the World Wide Web.

Adami (2014) developed a “social semiotic framework for the multimodal analysis of website interactivity” (p. 133). She defined interactivity as the relationship between a user and a text; more specifically, a person and a website. Users’ interactivity with websites, or what they can do to a webpage, happens when they click, touch, or type something onto the screen. These actions change the text physically, and from a social perspective, a user gains something from the action. Forms (elements containing hyperlinks), actions (clicking, typing, or anything else that can activate forms), and effects (things that change the screen, such as “liking” a post), are all semiotic signs that engage the user in interactivity. Her framework proposed the juxtaposition of syntagmatic and paradigmatic dimensions with the sign’s ideational function, interpersonal function, textual function, and interactive value in order to understand the meanings and the discourses surrounding interactivity. This framework should be used in conjunction with methods that are used to analyse the text-based content on websites in order to create a more complete picture of the interactions.

Multimodal ethnography. Multimodal ethnography, as the term suggests, is used to find meanings through integrated media, or “multi-semiotic modes” (Dicks et al., 2006, p. 77). Dicks et al. (2006) outlined this approach by means of describing their project that sought to understand how children play in a hands-on science centre. The researchers’ digital recordings of interviews and observations allowed them to observe the modes that create the experience of the science centre, including “colour, texture, light, gesture, and so forth” (Dicks et al., 2006, p. 86), and they noticed how different media provided different semiotic information. They found that video recordings provided much more data than their field notes.

Also reflecting on multimodal ethnography, Dicks and Mason (2012) share the advantages of using “hypermedia” in ethnographic research, where “hypermedia” is defined as a type of hypertext incorporating “a wide variety of media other than text” (p. 131). With multimodal approaches and hypermedia, ethnographers can easily link and integrate different types of modes, whether still and moving images, printed or spoken words, or graphical representations. The possible links are beneficial because they help the data keep their contexts.

Methods that typically accompany ethnography such as participant observation and interviews cannot be used in ethnographic studies of social media documents, since the data consists found items from frequently anonymous creators. That being said, multimedia ethnography still holds promise for studying the social construction of meaning through the rich artefacts that producers of user-generated YouTube videos, Instagram photos, and so on share online in order to communicate their lived experiences to their audiences.

Future directions

The social and societal impact of information shared by users on the Web continues to grow in influence. As Mautner (2012) explained, “[i]n a variety of domains – from the intensely personal and local to the public and global – discourse on the web is now a key factor in constructing representations of reality and social relationships, while also establishing new conventions for both textuality and intertextuality” (p. 89). These elements of communication are not merely textual in the traditional definition of “textual” (words on a page), but are also communicated through a range of outlets, such as films, photographs, music, spoken words, and video games. On social media, these outlets communicate so much about individuals and their worlds: feelings, interpersonal relationships, interests, milestones, and anything else that

people find important enough to share with their audiences. In turn, their audiences, who can consist of friends and family or complete strangers depending on the user and the social media channel, have the opportunity to interact with these documents by viewing them, “liking” or “disliking” them, leaving comments on them, and sharing them (McCay-Peet and Quan-Haase, 2016).

The interplay between language-based and non-language-based documents on social media must be examined together if social science researchers intend to maximize their findings, but the methods they use must differ from the status quo. While this chapter has presented a range of methods that can be used (given the right datasets and appropriate research questions) to analyse non-text social media documents, more work is needed to develop methodologies that will encompass the rich interactions, possible interactivities, and modes of digital communication that can be found today and in the future. As the documentation of lived experience and societal norms evolve, so must the toolkit of a social science researcher.

In conclusion, it is perhaps a responsibility to ensure that research methods enable timely analysis of society’s creations, but many questions regarding the development and implementation of these methods have yet to be answered. For example, how can the relatively recent appearance of non-text documents achieve the same status in social science research as the long-standing text-based documents possess? How can the textual and the non-textual be integrate with one another in data collection and analysis while still observing the special challenges that non-text items present to researchers? Although all existing analysis methods to date are described in text, could social science researchers envision a research environment in which we use formats other than text to describe future approaches to analysing non-text documents? The potential to shape the uncharted non-text territory is

wide open, and social science researchers who study social media phenomena must answer the call to form it.

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