Semester: 10th

Title:

Understanding the effect of anchors on narrative print ads using eye-tracking and text-analysis

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Abstract:

This report presents theories related to the comprehension of print ads. Narratives were shown as a tool occasionally used in print ads. Print ads also often have an anchor present which re-contextualizes the ad. Examples of an anchor could be either a company-logo or a catch-phrase.

Theories related to narratives and visual rhetoric in ads were investigated and Ryan's definition of narratives was used to categorize a series of images according to their level of narrativity. These images were then used in a within and between-group experiment in which subjects were shown 5 ads, each with different degrees of narrativity. The presence of an anchor and the level of narrativity were the two independent variables in the experiment. While looking at the ads, an eye-tracker was used to record their gaze. In between each image, the subjects were presented a questionnaire in which they were asked to explain the story behind the ad.

The results showed that the gaze-patterns and intelligibility of ads with low levels of narrativity were less likely to be influenced by the presence of an anchor.

Contents

Introduction

In today's world, advertisement can be present in many different media such as television, outdoor bill-boards, computers, mobile and print. The two most dominant forms being online advertising and TV advertising. (Digital Ad Spending Surpass TV Next Year, 2014) The expectation seems to be that online ads will soon surpass television ads as the leading form of advertisement.

However, one form of advertisement which is often overlooked is print advertising. In a recent survey, while online pop-ups and mobile ads were shown to be the most hated form of advertisement, print ads were chosen by consumers as the least disliked form of advertisement. (Most Disliked Ad Types, 2016)

The immense presence of online ads has also had a negative impact on consumers attention towards them. Consumers are now becoming more "immune" to online advertisement, this is often referred to as "banner blindness" and is a concern for most online advertisers. (Banner Blindness, 2106) This is an issue that print ads do not have to deal with as readers are usually highly engaged in the content of the magazines. (Newtek, 2012) (Soam, 2015). Print advertisement is also a great way of creating a brand image and targeting specific markets (Soam, 2015).

While there are some benefits to print ads, there are also some issues that have to be addressed. Unlike online ads, which can easily be redeployed if an error is found, print advertising does not have the same capability. Once the magazines are printed and shipped, it would take enormous effort to change the content. This really puts emphasis on creating an ad that is thought-through and resonates with the consumer. This means that ads have to be tested to understand how the message that is being conveyed by the ad is interpreted by the consumer. A misinterpretation of the message could have negative impacts on the brand.

This report will look into different forms of print advertisement and the methods and tools which are used to evaluate the conveyed message and the visual content of an ad.

Visual Rhetoric

In the context of understanding the visual composition of print ads and how they persuade people, it is important to have a look at visual rhetoric.

Intuitively, one might extract the meaning of visual rhetoric by looking at how rhetoric is used in general. Rhetoric involves skilfully manipulating words in a manner that makes them persuasive. It could be argued that visual rhetoric is the manipulation of visual figures in a manner that makes them persuasive. One would also intuitively assume that the rhetorical devices that are present in written rhetoric would also be present in visual rhetoric. However, researchers such as McQuarrie and Mick, argue that speech and figures are two different things, thus they must be treated differently. Rhetorical devices within the visual and verbal domain are not interchangeable (Phillips & McQuarrie, 2004). They also present a definition of visual rhetoric which can be described as "an artful deviation from audience expectation that occurs at the level of style, not content, and is not judged as an error by the audience " (MCQUARRIE & MICK, 1996) .

An example of a rhetorical figure can be seen in figure 1. The illustrated ad is an example of a visual metaphor. The environment and objects in the ad suggest that the object on the cake stand should be a cake, however a burger is placed on the cake stand. The text and the logo on the ad helps the consumers create an inference about the true message of the ad which is a celebration of McDonald's 60 years of business. Metaphors are very commonly used rhetorical figures in advertising, but are far from the only ones. Another example of a rhetorical figure could be a hyperbole which could also be used to convey a message. Rhetorical figures can also be used to facilitate the creation of a narrative in an image.

Figure 1 Example of rhetorical figure

Different typologies have been proposed to facilitate the identification, categorization and analysis of visual rhetoric. The following sections will describe some of these typologies, categorizations and heuristics by some of the most prominent researchers of visual rhetoric in advertising.

Forceville

Forceville's taxonomy is directed towards metaphors rather than towards visual rhetoric. Forceville distinguishes between 4 different kinds of pictorial metaphors in ads. Ads in which both the terms of the metaphor are visibly present (C *in figure 2*), ads in which one of the terms is present whereas the other can be inferred from the context (B *in figure 2*), ads in which two of the terms are merged (D *in figure 2*) and what he calls verbo-pictoral ads in which both verbal and visual elements combine to create a metaphor (A *in figure 2*). Examples displaying these metaphors are illustrated in figure 2.

Figure 2 (A) Is an example of a verbo-pictoral ad in which the bear with a mannequin along with the text "the voice of the planet" create a metaphor insinusating that green peace speaks on the behalf of the planet. (B) Is an example of an ad in which one term is present, "smoking," while the other term, presumably "kills, can be infered from the shadow on the wall resembling a gun. (C) is an example of an ad in which both terms, "pringles chips" and "authetic pizza" are visibly present and the consumer can make the inference. (D) is an example of merged metaphore in which the fork also symbolizes the action of lending a hand.

Furthermore, Forceville claims that for an image to contain a visual metaphor, the following three questions must be answered:

1. What are the two objects?
2. Which one is the source and which one is the target object?
3. What attributes are to be transferred from source to target?

Forceville's model is useful towards determining whether or not an ad is using pictorial metaphors. The issue with this model however is that it generally only applies to visual metaphors and not necessarily all forms of visual rhetoric.

McQuarrie and Phillips

McQuarrie and Phillips argue that visual rhetoric is essentially about establishing a relationship between two terms (Phillips & McQuarrie, 2004) . In their typology, they argue for the possible relationships between terms. A typology is proposed in in which they distinguish between nine different kinds of visual rhetorical figures. The rhetorical figures are categorized according to their

degree of complexity and ambiguity. Figure 3 illustrates the above-mentioned typology. The y-axis dictates the complexity of image and includes visual structural elements of the figure such as replacement, fusion and juxtaposition**. Replacement** is present if the term-A is entirely replaced by term-B in which case the consumer will have to inference the source object. **Fusion** is present if term-A and term-B are merged into a visual element. **Juxtaposition** is present if term-A and term-B are placed in the same frame, in which case the inferences are not complex.

The x-axis or the richness axis consists of meaning operations. Meaning operations describe the way in which term-A and term-B are related. McQuarrie and Phillips claim that the associations made between terms can either be described as a connection, similarity or opposition.

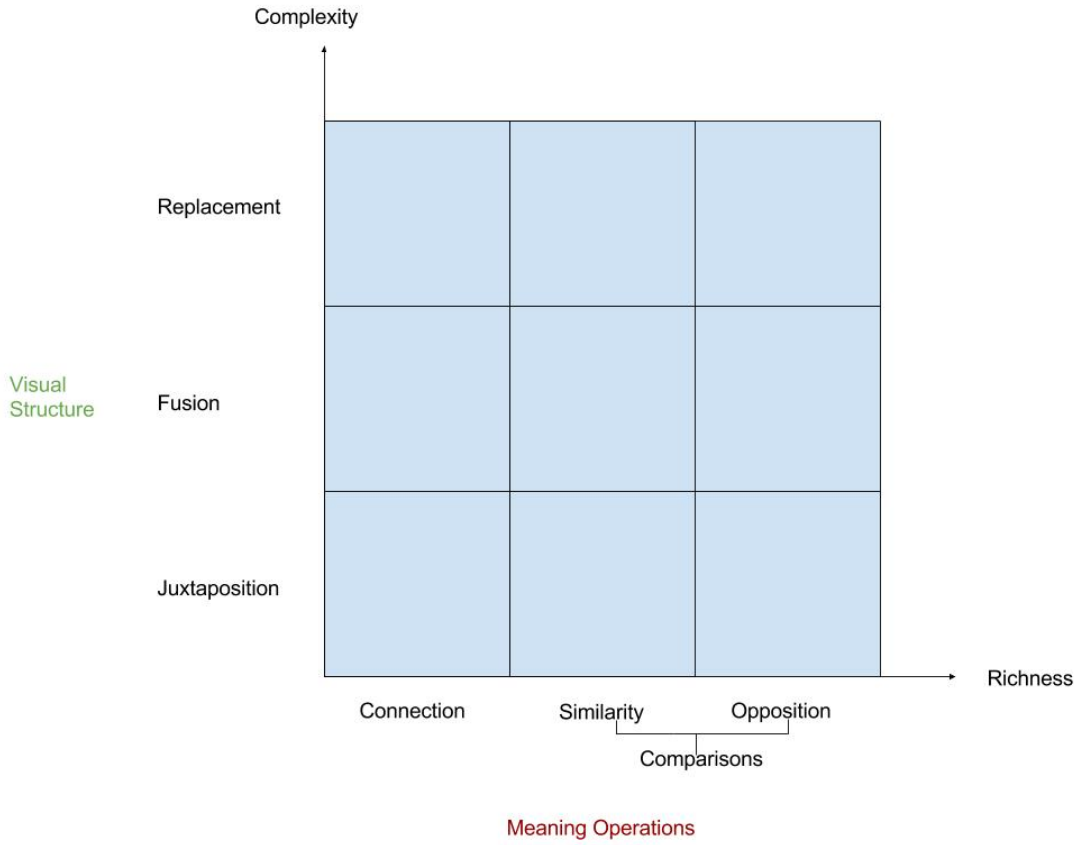


Figure 3 Illustration of McQuarrie and Phillips typology

McQuarrie and Phillips argue that cognitive processing of the images vary depending on the quadrant of the typology in which the ad is placed.

Responses to degree of complexity may vary depending on the consumer. Ads that are placed in the upper boundaries of the complexity axis are more likely to be influenced by the consumer competence. Elements such as cultural assimilation, knowledge of product and familiarity with

advertisement could influence the consumers' ability to interpret the ad. This puts the ad at risk of not being understood by consumers. Ads that are in the lower end of the complexity axis however, are less likely to be influenced by consumer competence.

Consumer motivation can also play a role in their ability to interpret complex ads. Consumers who are more motivated by the ad are more likely to be willing to expend cognitive effort on decoding the ad message.

Based on their research, they present four propositions which they wish to be the focus of future research.

1. More complex and richer visual figures will result in higher degrees of cognitive processing.
2. Richer figures, while not complex will result in a greater degree of belief change when specific beliefs are measured.
3. More complex and richer visual figures will be better liked
4. More complex and richer visual figures are more likely to be recalled after exposure

Heuristics for determining visual rhetoric

McQuarrie and Phillips (McQuarrie & Phillips, 2008) argue that their previous definition of a visual rhetoric: "an artful deviation from audience expectation that occurs at the level of style, not content, and is not judged as an error by the audience is faulty. They argue that the majority of ads actually use non-literal visual figures, and because of this, an ad which literally presents the product might actually be a larger deviation from expectation. He also argues that ads can deviate from expectation without being rhetorical. With this in mind, McQuarrie and Phillips present two heuristics aimed at determining whether or not an ad is rhetorical. (McQuarrie & Phillips, 2008)

1. *"Does the ad contain perceptual queues that trigger a meaningful relation between term-A and term-B? "*
2. *"Does it contain two objects or domains one which is conceptualized in terms of the other"*

If the answer to both questions is true, then the ad can be labelled as rhetorical. These Heuristics are a product of a segmentation of visual rhetoric into perceptual and conceptual rhetoric.

Ads which use visual perceptual factors such as perspective, distance and spatial orientation in order to establish a relationship between term-A and term-B can be said to contain perceptual rhetoric.

Conceptual rhetoric is a case in which an object or term is selected not for its actual meaning but rather for what it symbolizes, its features or what it is associated with.

Weak implicature vs strong implicature

Advertisements that contain rhetorical figures require the consumer to inference an understanding of the ad based on a visual stimulus. This makes the message of the ad very subjective because it can be interpreted in many ways. Ads that allow for multiple interpretations can be classified as open ads. The inferences which the consumer derive from open ads are called weak implicatures. Ads in in which most consumers agree on the interpretation are said to have "strong implicature" (Phillips B. J., Thinking Into It: Consumer Interpretation of, 1997).

An extremely open ad can be detrimental towards conveying a message as consumers will dislike ads in which they are unable to form an inference. (Phillips & McQuarrie, Visual Rhetoric and International Advertising, 2014).However, a certain degree of openness and inference complexity in has shown to have a positive response on consumers. The reason being that consumers will be expending their cognitive effort trying to decode the message rather than questioning the claims of the ad. (Phillips & McQuarrie, Visual Rhetoric and International Advertising, 2014). Consumers also tend to view a rhetorical ad as a puzzle and feel certain degrees of satisfaction after decoding the message. (Phillips & McQuarrie, Visual Rhetoric and International Advertising, 2014). In a study of how consumers comprehend metaphors in ads, Morgan and Reichart reported that the messages of concrete metaphors were more clearly understood when compared to abstract metaphors. (Morgan & Reichert, 1999) However, Morgan and Reichert claim that this should not discourage the use of abstract ads, but rather that they should be used appropriately. In the article, they also discuss how degree of abstraction used in metaphors could allow for ads to be targeted towards specific populations. (Morgan & Reichert, 1999)

An eye-tracking study of ads with weak and strong implicature has shown that open ads have a large mean fixation duration when compared to ads with strong implicature. (Ph.D., Ph.D., & Bosman, 2008). Mean Fixation duration has been linked to cognitive load (Rosch & Vogel-Walcutt, 2013) and could be an indication of the cognitive effort expended by the consumers.

Verbal vs Visual rhetoric

The rhetoric in visual ads can either come in verbal format or in visual format. A verbal rhetorical ad would require the inclusion of some form of rhetorical text. There having been studies comparing the effectiveness of verbal and visual rhetoric in print ads.

A study by Mick and McQuarrie has also shown that when accidently exposed to ads, consumers will have better recollection and liking towards visual rhetoric rather than verbal rhetoric (Mcquarrie & Mick, 2003). Morgan and Reichert have also reported higher degrees of comprehension for ads containing visual metaphors when compared to verbal metaphors (Morgan & Reichert, 1999).

Ads can also contain both verbal as well as visual rhetoric in which case the text is often referred to as a “verbal anchor”. An example of an ad with verbal anchor can be seen in figure 4.

Verbal anchors are very useful in the situation where an ad might be to abstract for consumers to extrapolate its message. The use of a verbal anchor facilitates the interpretation of the message by providing them with a text indicating how the figure is to be interpreted. In such a scenario, verbal anchors are well received by the users. However, it’s also possible that the verbal anchors facilitate the interpretation of the ad to a point where the consumer no longer feels the satisfaction of decoding the ad message, ultimately having a negative impact on the consumer. (Phillips & McQuarrie, Visual Rhetoric and International Advertising, 2014)

Anchors can also be present in the form of a company logo, in which case they are no longer verbal, however they still re-contextualize the image.

Phillips and McQuarrie also argue that the decreasing use of verbal anchors in North American ads could be because of the negative effects associated with verbal anchoring. (Phillips & McQuarrie, Visual Rhetoric and International Advertising, 2014)

Figure 4 Two images in juxtaposition and with verbal anchors to illustrate that while a shark can be horrifying, the prospect of extinction is even more horrifying

Narratives in advertising

Narrative ads are said to be ads in which the message is conveyed through story-telling. (Lien & Chen, 2011). Narrative ads have been shown to be a large part of today's advertisement. The consumer's attention is captured through the use of appealing stories, which emphasize specific qualities of either the product or the company. This makes narrative advertising particularly effective in establish a specific brand image. (Lien & Chen, 2011)

Narrative advertising has also shown to be useful in establishing a brand image for services. A brand image is the mental picture which the consumer creates of a specific brand, in response to a brand-related stimulus. Through the use of narrative advertisement, companies are able to influence what different consumers associate with their brand.

This is particularly the case with services, where the product is not tangible. Through the use of narrative advertisement companies are able to use stories to properly establish the benefits of their services while also establishing a brand image. (Padgett & Allen, 1997)

There has been research that indicates that narrative ads are less efficient in arguing for the benefits of a product when compared to non-narrative ads. Lien and Chen argue for utilizing non-narrative ads in situations where there is a strong argument for purchasing a product and using narrative ads for situations where there are weaker arguments for purchasing a product. (Lien & Chen, 2011) .

Narrative advertisement was also shown to increase a person's ability to understand the ad and form a mental picture in response to it. The same study also shows that ads that contain narratives which people can relate to also facilitate the comprehension of the ad. (Chang, 2013)

Narrative intelligibility and closure

Earlier in the report, a topic of much discussion in regards to visual rhetoric was whether the message interpreted by the consumer is what is intended by the company. This is also an issue that exists within narrative systems and narrative advertisement. A theory that very much relates to this issue is the theory of narrative intelligibility and closure.

Intelligibility relates to how the viewers decode the message of the author and is a function of what is known as the Author-Audience distance (AAD). If most of the viewers decode the narrative in a way that the message is what the author had intended, the narrative is said to have low Author-Audience Distance. However, if the decoding of the message varies between viewer, the narrative is said to have a high Author-Audience distance (Bruni & Baceviciute, 2013). To put it in another way, didactic

narratives are likely to have narrative intelligibility while abstract narrative are less likely to have narrative intelligibility.

Narrative closure is the sensation of coherence and understanding after having experienced a narrative. Viewers can still have narrative closure, despite not having correctly interpreted the narrative i.e. a narrative with low intelligibility. However, a narrative system with narrative intelligibility presupposes narrative closure. (Bruni & Baceviciute, 2013)

If this theory is extended towards the field of narrative advertising, the assumption would be that in order to correctly convey their message, a narrative ad should contain both narrative intelligibility and closure.

Defining a narrative

Before looking at how narratives influence advertising, it is important that we first define what a narrative is. Herman views narrative as a collection of a specific set of elements. These elements are listed below (Herman, 2009).

1. *"A representation that is situated in – must be interpreted in light of – a specific discourse context or occasion for telling. "*
2. *"The representation, furthermore, cues interpreters to draw inferences about a structured time-course of particularized events.*
3. *In turn, these events are such that they introduce some sort of disruption or disequilibrium into a storyworld Involving human or human-like agents, whether that world is presented as actual or fictional, realistic or fantastic, remembered or dreamed, etc."*
4. *"The representation also conveys the experience of living through this storyworld-in-flux, highlighting the pressure of events on real or imagined consciousnesses affected by the occurrences at issue. Thus – with one important proviso – it can be argued that narrative is centrally concerned with qualia, a term used by philosophers of mind to refer to the sense of "what it is like" for someone or something to have a particular experience. The proviso is that recent research on narrative bears importantly on debates concerning the nature of consciousness itself. "*

A different definition of narrativity is presented by Ryan. Ryan presents narrative as a function of four different dimensions: Spatial, Temporal, Mental and Formal & pragmatic. The requirements for each of these dimensions are briefly described below. (Ryan, 2006)

Spatial dimension:

- The narrative must take place in a world that is occupied by characters with individual traits

Temporal Dimension:

- The world in which the narrative takes place must be situated in time and be subjected to transformation.
- The transformation must not be caused by habitual physical events.

Mental Dimension

- A few of the people in the world must be intelligent agents that possess consciousness. These agents must also be able to react emotionally to changes in the story-world.
- Some events must be plotted by these agents, and they must have a reason for doing so.

Formal & Pragmatic

- There must be a cause behind the series of events that eventually leads to closure.
- At least some of the events that take place have to be seen as fact for the story world.
- The story must have a meaningful message to those who are receiving it.

Ryan defines a narrative as a scalar that is a function of these dimensions. Media which contain elements from several of these dimensions of narrativity are said to have a higher degree of narrativity than those who contain fewer elements.

While Researchers have differing opinions on what a narrative is, the research that is presented in this chapter indicates a shared belief that a narrative should not be viewed as a binary but rather as a scalar. So rather than questioning whether a medium is expressing a narrative or not, one should question the degree of narrativity instead.

Can a picture tell a story?

Different forms of media afford different kinds of narratives. While media such as movies might have high degrees of narrativity, other forms of media such as print might have lower degrees of narrativity and afford different narrative modes. Different media can also be used to create a multi-modal narrative approach. (Herman, 2009) (Ryan, 2006)

While there are many different potential vehicles for a narrative such as movies, recordings and theatres, there seems to be a large discussion on the topic of whether or not an image can serve as a vehicle for a narrative.

Ryan (Ryan, 2006) claims that an image ise a medium that is capable of:

- Immersing the spectator
- Mapping the story world
- Illustrate past and future through the use of visual rhetoric
- Capture the emotion of characters by their facial expression
- Illustrate beauty

While it is sometimes hard to form a narrative from an image, Ryan mentions that verbal representation in images often can be used to add to the level of narrativity in images. For example, the title of an image might change the way in which a story is inferred. Verbal inscription on objects that are present in the image can also contribute to a narrative. Techniques that are often seen In comics, such as using image frames to depict change in time or the use of thought bubbles, are also methods of increasing the narrativity of an image. (Ryan, 2006)

Speidel presents the two main arguments for why pictures are generally not considered narratives. One of the issues regarding classification of images as a vehicle for narratives is because of the supposed lack of temporal structure in images. (Speidel, 2013). Pictures cannot show the chronological order of the events present in the image. Temporality is seen to be a basic element of narratives (Speidel, 2013). Herman argues that for a narrative to be a present, the interpreters of the narrative must be able to draw inferences about the temporal structure of the given events. (Herman, 2009)

The second argument made for pictures not being a vehicle for narratives is that a picture only shows rather than tells. Pictures do not have the narrative propositions that are necessary for a story. (Speidel, 2013)

Speidel however, uses paintings as a way of illustrating that pictures can contain a temporal structure. He also argues that the order in which the elements of the picture are viewed can have an impact on the perceived temporal-structure. While Speidel makes a good account for the perceived temporal-structure of narratives in images, it is largely up to the interpreter to create an inference towards the story in the image. This was mentioned earlier as one of the main arguments against pictures containing narratives. Speidel finishes of his article by concluding that while images can't be categorized as narratives, there are images that can be said to have high degrees of narrativity.

The argument for narrativity in images is made even stronger by the existence of the genre "narrative arts". Narrative arts, as the name would suggest, is art that tells a story through imagery. (Bacigalupi, 2017). Narrative art has existed for millennials. Cave paintings depicting humans on their hunt for

animals are some of the earliest examples of narrative art. Narrative art, today, is still a relevant means of telling stories, especially in societies with high levels of illiteracy. (Megehee & Woodside, 2010). An example of narrative art can be seen in figure 5.

Figure 5 This amphora is an example of the early forms of narrative art. The painting on it could suggest that these two men are fighting over the love of a woman. Adopted from (Bacigalupi, 2017)

However, narrative art has also evolved and its presence is seen on many of the mediums present in a modern society such as magazines or screens. Some of the creative print ads that are seen today which skilfully utilize visual rhetoric to convey a story to the consumer could be argued to be examples of narrative art.

Tools for analyzing advertisement

Eye-tracking and text analysis have been shown to have multiple uses for analysis across many difference disciplines. This chapter provides an insight towards how these methods are being used across different disciplines as well as within advertising.

Advertisement analysis through eye-tracking

Recently, there has been a surge in the amount of research that has been conducted using eye-tracking (Horsley, Eliot, Knight, & Reilly, 2014), this surge is something that is seen across multiple disciplines such as medicine (Shahimin, et al., 2014) , Human-Computer interaction (Blignaut, 2014), and even computer education (Ruder, 2016) (Bednarik, 2012). What is most relevant towards this report however, is the use of eye-tracking within advertising.

In a research by Pilelien and Grigaliunait, eye-tracking was used to measure the effects of lay-out complexity of still-images ads on visual attention. A selection of images, varying in complexity are presented to 30 subjects. The complexity of the images is based on the assessment of a group of experts according to the gestalt principles. No time constrains were placed on the subjects and they were able to look at the stimulus for as long as they deemed necessary. In this research, average viewing time, average brand viewing time and fixation count are the metrics used to infer visual attention. The result of the research indicated that while complex layouts increased attention towards advertisement, they did not increase attention towards the brand. However, the emphasis here should be on the use of eye-metrics as an inference for visual attention. (Pilelien & Grigaliunait, 2016).

Eye-tracking can also be used as a way of assessing attention towards specific areas of interest as demonstrated in a research by Bebko et al. (Bebko, Sciull, & Bhagat, 2014). In this research, the attention towards three specific visual elements is measured. The ad was aimed at persuading people to become donors. The three visual elements are the following: a face, a logo and text. In this specific study, fixation count, time till first fixation, and fixation duration are used to infer attention to each specific visual element (Bebko, Sciull, & Bhagat, 2014). The result of this research indicated that participants who spent more time looking at the face were more likely to recommend others to donate.

Instead of looking specifically at the attention towards the visual elements in an ad as shown in the above-mentioned research, it might also be valuable to look at the order in which they are seen. An example of this can be found in a research by, Pieters et al. where an investigation is conducted on the effects that repeated exposures have on attention and scanpath (Pieters, Rosbergen, & Wede,

1999). The results show that while the attention towards the ad declines after repeated exposures, the scan path remains the same.

When looking at attention towards specific visual elements, tools such as a heatmaps and scanpaths can help visualize the subjects viewing and attention patterns. Heatmaps are usually seen as an overlay on the original stimulus in which degree of attention is represented by opaqueness and colour (Scott, Green, & Fairley, 2016). Scanpaths are usually represented as an overlay of nodes onto the stimulus. These nodes represent a fixation and are numbered according to the order of their occurrence. An Eye-tracking analytical software such as Ogama (Ogama, 2016) can be useful when attempting to create heatmaps and scanpaths. Examples of scanpaths and heatmaps are displayed in figures 6 and 7.

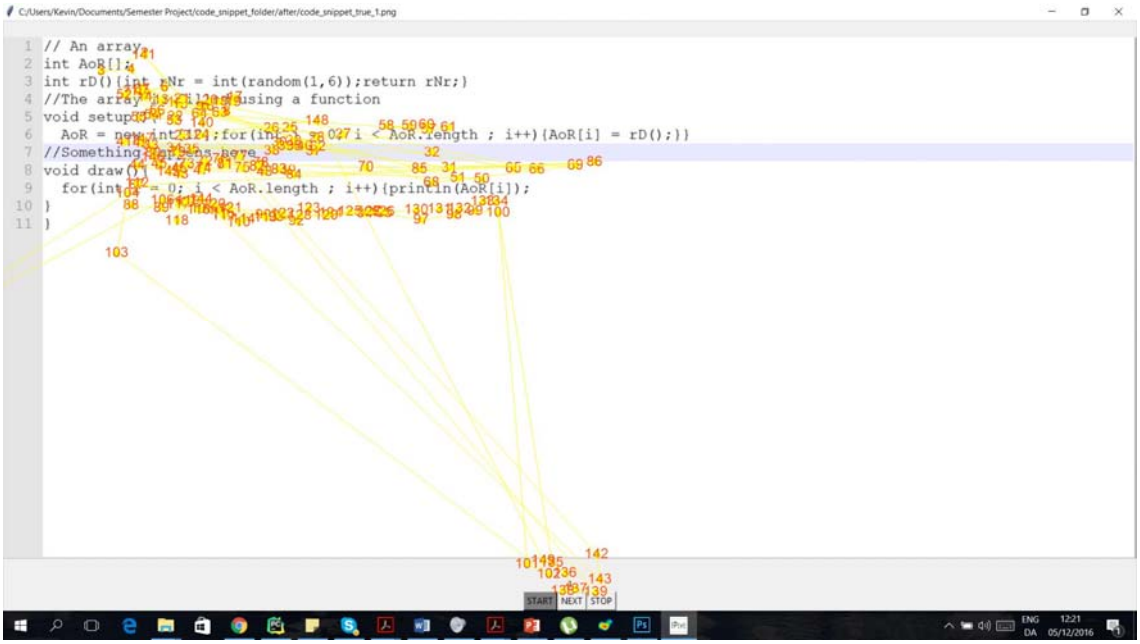


Figure 6 Example of scanpath created using Ogama.

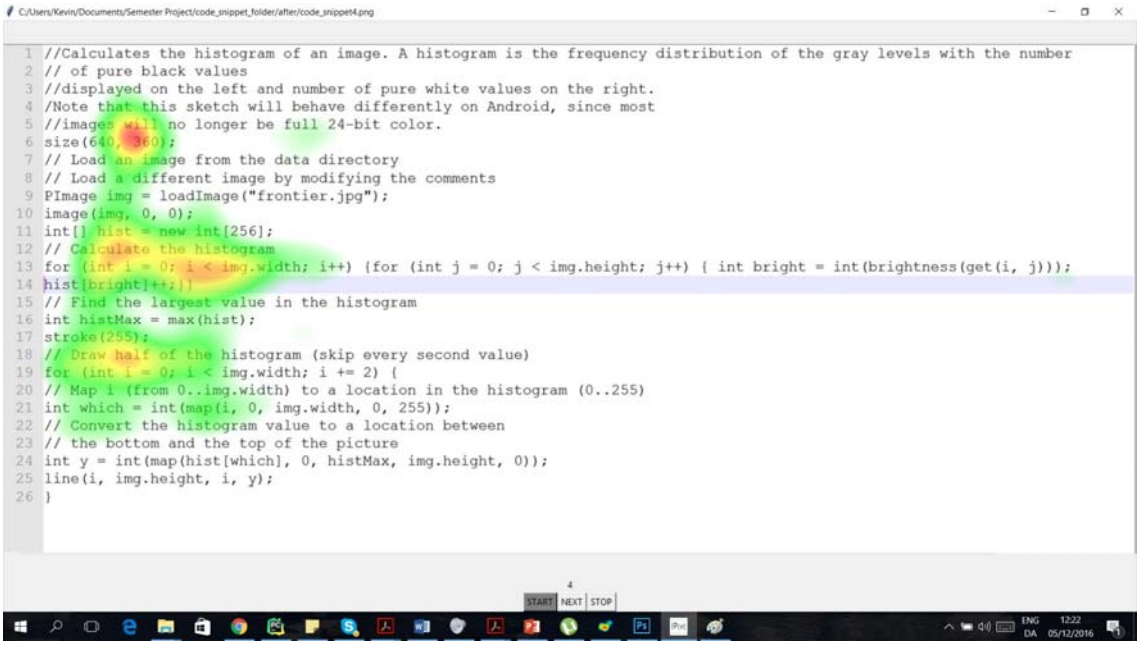


Figure 7 Example of a heatmap, also created using Ogama

Eye-tracking metrics such as fixation duration, pupil size, saccade velocity, fixation counts have all been used as a measurement of cognitive load (Rosch & Vogel-Walcutt, 2013). Cognitive load is a theory that provides an indication of the capacity of the working memory of humans. (Sweller, Merrienboer, & Paas, 1998). The comprehension of a still-image advertisement can consist of multiple cognitive processes. (Phillips & McQuarrie, 2004). One could speculate that ads that are too abstract or have a very complex layout could put a strain on our working memory i.e. increase the cognitive load. The above-mentioned eye-tracking metrics could be used as an insight towards the complexity involved in understanding or decoding ads.

When conducting an experiment using an eye-tracker, it is necessary to be aware of factors that might influence your subjects eye-behaviour, in order to avoid corrupting your results. One of these factors is lighting. Controlling the lighting of your experiment environment is especially important when dealing with eye-metrics related to the pupil. The pupil has a mechanism called “the pupillary response” which causes it to change size according to lighting conditions (Shahlaie & Muizelaar, 2012). Experimenters must also be aware that the subjects scan path is likely to be affected by any given instruction. This needs to be taken into consideration when designing an experiment. (Duchowski, 2007)

Advertisement analysis through content-analysis

Another way of assessing the message conveyed through an ad is with content-analysis of the consumer’s response. While it is possible to write entire books on each of the methods, this chapter

will serve as a brief overview of different methods used for extracting data from text. The reason being that the goal of this report is not to improve on the state of the art methods for text-analysis but rather use them as a tool for analysis.

Sentiment Analysis

Sentiment analysis is a method that attempts to extracts opinions, emotions and attitudes from text. It is often used by companies to analyse opinionated posts about their brand that can be found on social media such as blogs, discussion forums and social networks. (Liu, 2012)

Sentiment analysis generally works by splitting up a document into several different words or sentences, this process is called tokenization. Once the document has been split, each token can be assigned a sentiment polarity, often using the help of a sentiment lexicon. (Raval, 2016) The total sentiment polarity of the complete document can then be calculated. Sentiment analysis can also be used to measure the subjectivity of a document, this can be a useful way of assessing whether the text is factual or opinionated.

Topic modelling

Topic modelling is another method which can be used in qualitive research to extract information from textual data. Topic modelling is an unsupervised model that learns a specific set of topics that are present in the document. Topic modelling often makes use of models such as latent semantic analysis (LSA) (Nikolenko, Koltcov, & Koltsova, 2015). LSA works by looking for underlying concepts and meanings within a document. This is done by mapping words and documents into a concept space in which they can be compared. Just like in sentiment analysis, a tokenization of the document is necessary before implementing the LSA (Bhagwant, 2001).

Term frequency-inverse document frequency

The term frequency-inverse document frequency(TF-IDF) is a numerical statistic that is often used in many different text-analytic methods. It is often used to understand the importance of a word given a collection of documents. It is also one of the most widely used methods for keyword detection. (Havrlant & Kreinovich, 2017). The keywords that best describe a document are said to be the ones with a higher values of the product tf-idf.

Research conclusion

So far, the structural elements of print ads have been investigated. Different typologies from visual rhetoric were presented and could be of use when categorizing a specific print ad. Still images were

found to have varying degrees of narrativity and Ryan's model presented certain aspects of an image that were found to add to its level of narrativity.

Forceville's model was also a topic of discussion and illustrates the different kinds of visual metaphors present in visual advertising and how they can be identified.

McQuarrie and Phillips' typology was presented in which the complexity of the ad is assumed to be determined by the structure of the rhetorical figures. The three structural categories were called juxtaposition, merging and replacement. Using eye-metrics as an inference of cognitive load, it would be possible to measure the cognitive load of subjects given the different structural categories. Text-analytics could also help provide an insight towards how different people decode the message that is present in the ad.

Most of the research in this report has pointed towards a balanced use of anchors. Using anchors in ads that are very simple were generally seen as displeasing by consumers, while ads that are too complex and do not have anchors will cause consumers to be unable to form an interpretation. Once again, the use of eye-metrics as well as text analytics to provide an insight on the subject's comprehension and perception of ads with and without anchors.

Throughout this report, variables that influence gaze-pattern and eye-metrics were presented. The framing of a question was shown to influence the gaze-patterns of subjects. A potential area of research could be to investigate whether narrative intelligibility of a still-image advertisement has an influence on the subjects' gaze patterns.

The terms weak implicature and strong implicature were also presented as a way of describing the interpretation of ads. These terms have a relation to the author-audience distance in narrative systems. Weak implicature can be seen as a large author-audience distance, while strong implicature can be seen as a small author-audience distance.

There was much discussion in this report about the narrativity of images. The conclusion was that while images were not seen as narratives, they could contain certain degrees of narrativity. It would be interesting to investigate whether scan patterns are influenced by the narrative potential of images. This could possibly lead to predictions on narrative potential of an image based only on gaze patterns. Eye-tracking analysis along with a textual analysis of the subjects' written interpretation of the narrative could provide a method for establishing whether an image has a narrative potential.

The analytical tools and theories that were presented in this chapter will form a foundation for the research questions in the following chapter.

Methods

Anchors have been shown to contribute to narrativity of an image. Print ads have also often used anchors as a way to add new meaning to an image. Other than anchors, there are also other elements that contribute to the narrativity of an image. With that being said the goal of this report from this point on will be to investigate how anchors influence the understanding and visual perception of print advertisements containing different levels of narrativity.

Research question:

How does the absence of anchors in print advertising influence the intelligibility and visual perception of print advertisements with different levels of narrativity?

The research presented so far has described anchors as being an effective tool for re-contextualizing complex ads. Ads with high level of narrativity should be less complex as there are element that help portray a story. My hypothesis is that the change that is seen in gaze patterns or intelligibility will be minimal in ads that have high level of narrativity. Thus, the following hypothesis is presented for the report.

Hypothesis:

Print advertisements with high levels of narrativity are less susceptible to change in intelligibility and visual perception in the absence of anchors.

An eye-tracker is used to collect measurements such as fixation duration and fixation count which provide a good indication of visual attention. Text analysis is used in order to evaluate the intelligibility of the ads.

Pilot Test

In order to create an understanding of what sort of data and responses that could potentially be retrieved from the subjects, a pilot test was conducted. The pilot test involved the selection of three images which were then shown to 5 subjects. The subjects were asked describe the story behind the image. The 3 images were selected based on their level of complexity according to the McQuarrie and Phillips typology. There was an ad that made use of juxtaposition, an ad that made use of fusion and an ad that made us of replacement. Two of the ads contained visible verbal anchors. The selected images be found in the digital appendix under the folder “Pilot test images”.

The responses that were given were very short and did not contain high degrees of narrativity. Although the pictures that were selected did not contain the highest levels of narrativity either, it is

possible that a more appropriate phrasing of the question could produce answers with some increased degree of narrativity.

Experiment design

An illustration of the experiment design is shown in figure 8. The experiment uses both within group and between group testing. Each participant is exposed to a stimulus corresponding to an image with a level or narrativity between 1-5. As shown in the image, both group A and B are exposed to the same images, however they have alternating anchors. Group A has anchors in levels 3-5 while group B has anchors in images 1-2. All 5 images had naturally occurring anchors, such as company logos or text. Each image in the experiment was edited so there would be a version of it without an anchor.

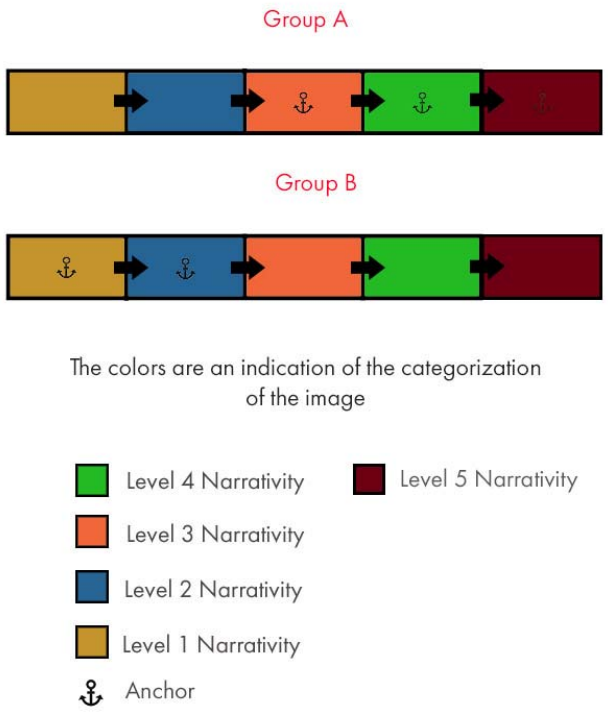


Figure 8 Experiment Design

While each subject is looking at the stimulus, their eye movements are recorded using an eye-tribe eye-tracker. After each image, the subjects are asked to write down whatever narrative they might

have extracted from the image. To extract as much of the narrative as possible, the sentence was phrased as such:

"There is a story behind this image, could you please describe what it is? "

This question is designed based on the results of the pilot test. When asked to describe the story behind an image, the answers that were given were very short and did not contain high degrees of narrativity. The questionnaire used in the experiment can be found in the digital appendix under the folder "Questionnaire".

Convenience sampling is used as a way of gathering as many subjects as possible.

Testing Environment

The experiment was conducted at the Aalborg University campus in Copenhagen. While all samples were taken at Aalborg University campus, an experiment phase of 7 samples was conducted at a different location within the campus. This could cause some issues in regards to the pupillometrics, given that the lighting condition might not be the same across the two locations. The remaining 23 samples were conducted in the cognition lab in an environment with controlled lighting.

Hardware specifications

An Eye-Tribe eye-tracker was used on a laptop with the following specifications:

Processor:	Intel®Core™ i7-4720HQ CPU @ 2.60 GHZ 2.59 GZ
Installed memory(RAM):	16.00 GB
Operating System:	Windows 10 64-bit

Test procedure.

The test subjects were informed about the test procedure.

The next step was to calibrate the eye tracker. Participants were asked to find a position in which they could sit comfortably for 10 minutes. Once they were seated comfortably the calibration process began. The process involves having the subject focus on circles that randomly appear on the screen. Once the calibration is over, it is given a rating from 1 – 5. After the calibration, a grid of 16 x 16 circles appears. If calibrated correctly, the circle which the subject is focusing on should turn red. The experiment would only proceed once the calibration rating was either 4 or 5 and the participants assured me that the circle which they were focusing on did in fact turn red.

Once the calibration was complete the subjects were shown the questions that they would have to answer in between each image and were asked to keep them in mind when looking at the stimulus.

The slideshow software was initiated, the subjects were told to press the stop button once they felt that they had interpreted a story from the image. The test conductor pressed the next button, followed by the start button, prompting the first image to appear and the eye-tracking to begin. Once the subject had clicked stop, they were directed towards the questionnaire. After the questionnaire, the last three steps were repeated for all five stimuli.

Selection of images

A sample of 32 images were selected as potential stimuli for the experiment. Before proceeding with the selection, the images were categorized according to their level of narrativity.

Categorization of images

The categorization of the narrativity of the images was done according to Ryan's assessment of images as a medium for narrativity. The categorization was also planned so that it would include the different dimensions of narrativity that are presented by Ryan: Spatial, Temporal, Mental, Formal & Pragmatic.

The following questions were used to evaluate the level of narrativity of the images:

1. Is it capable of mapping the story world?
2. Is it illustrating the past and future through the use of visual rhetoric?
3. Are there any characters visibly expressing and/or producing emotional reactions?
4. Does the image metaphorical and aesthetic content or visual creativity
5. The image allows to infer a meaningful causal chain

I categorized the images into levels of narrativity which adds some subjectivity to the experiment. The level of narrativity will range from 0-5, gaining a level for each question in which the answer is true. This way it is possible to assign a numerical value to the degree of narrativity present within the image.

Ryan also mentioned how verbal objects contribute to a narrative. The experiment will have verbal and non-verbal anchors as independent variables, so it would not make sense to include them in the assessment of the level of narrativity of images.

An example of the categorization is shown in figure 9.

Figure 9 The level of narrativity of this image was categorized to 5. 1) The spatial aspects of the image are well illustrated. 2) The two frames provide a means of inferring past/present or an alternate reality. 3) Both the dog and the man are expressing emotion. 4) The image does contain a visual metaphor for loneliness and companionship while also being visually creative. 5) The image suggests that adopting a dog will make your life happier

Level of narrativity	**0**	**1**	**2**	**3**	**4**	**5**
Images in that category	**1**	**7**	**11**	**9**	**3**	**1**

Table 1 Distribution of images according to level of narrativity

The distribution of images according to level of narrativity are shown in table 1. As you can see, the majority of the images that were found contain few elements of narrativity. The images can be found in the digital appendix under the folder “Pre-filtered Experiment Images”, they are sorted according to their categorization. Two of the images were excluded from the selection process as they were composed solely of verbal objects.

An image was selected from each of the categories, the aim of the selection was to pick images that could have the anchors removed without an extreme disturbance of the visual content of the image. Figure 10 provides a quick overview of the selected images and their assigned level of narrativity. A

higher resolution version of the images can be found in the digital appendix under the folder "Experiment Images".

Level of narrativity	Image name	Image	Description
1	McDonalds Ad		An ad from McDonalds to inform the public about the free wifi service in their restaurants.
2	Chupa Chups Ad		An add from Chupa Chups to promote their new sugar-free lolipop. The ants refrain from eating the lollipop because there is no sugar in it
3	Weight Watchers Ad		The two doors with differing sizes are used as a metaphor for the transformation a person will go through while following the weight watchers program
4	Nivea Ad		An ad from Nivea to promote their face-cream. In the ad a child pulling down on the wrinkles is used a metaphor to show how life gives you wrinkles
5	Pedigree Ad		An ad from Pedigree in which they attempt to promote adoption. A juxtaposition between two similar images, one containing a dog and one without.The sentiment extracted from the image is very different depending on whether the dog is there or not

Figure 10 Table with the selected images and their assigned level of narrativity

Defining Areas of Interest

Earlier in the report it was documented that looking at eye-metrics within a specific area of interest could be helpful towards understanding how people perceive the stimulus. In this project, the stimuli that were presented to the subjects were partitioned into specific areas of interest. An example of this is shown in figure 12. The illustration of the areas of interest for all stimuli can be found in the digital appendix under the folder "Areas of interest".

In order to define the areas of interest, heatmaps were formed with the eye-tracking data. An example of a heatmap that was gathered from the Chupa Chup is shown in figure 11. The heat maps assisted in evaluating which objects in the image drew the most attention. These objects or areas were then defined as areas of interest. The heat maps can also be found in the digital appendix in the folder "Heatmaps".

Table 2 presents a short overview of the different areas of interest that can be found in each image. Notice that not all images have an equal amount of areas of interest.

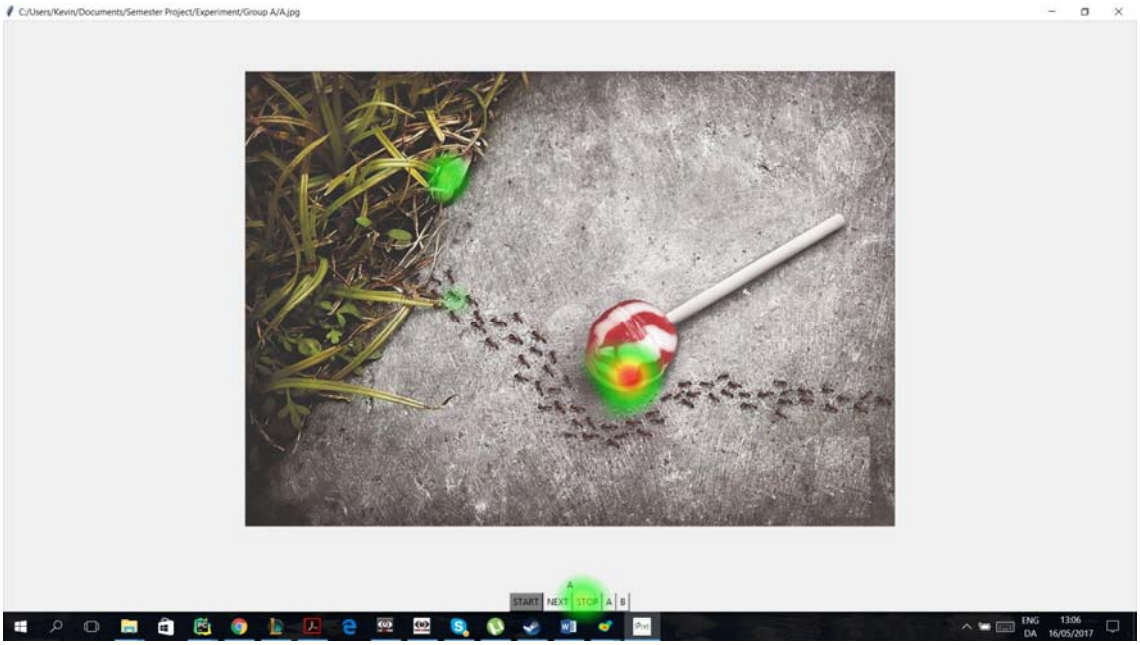


Figure 11 Heatmap of a subject while looking at the Chupa Chups' Ad

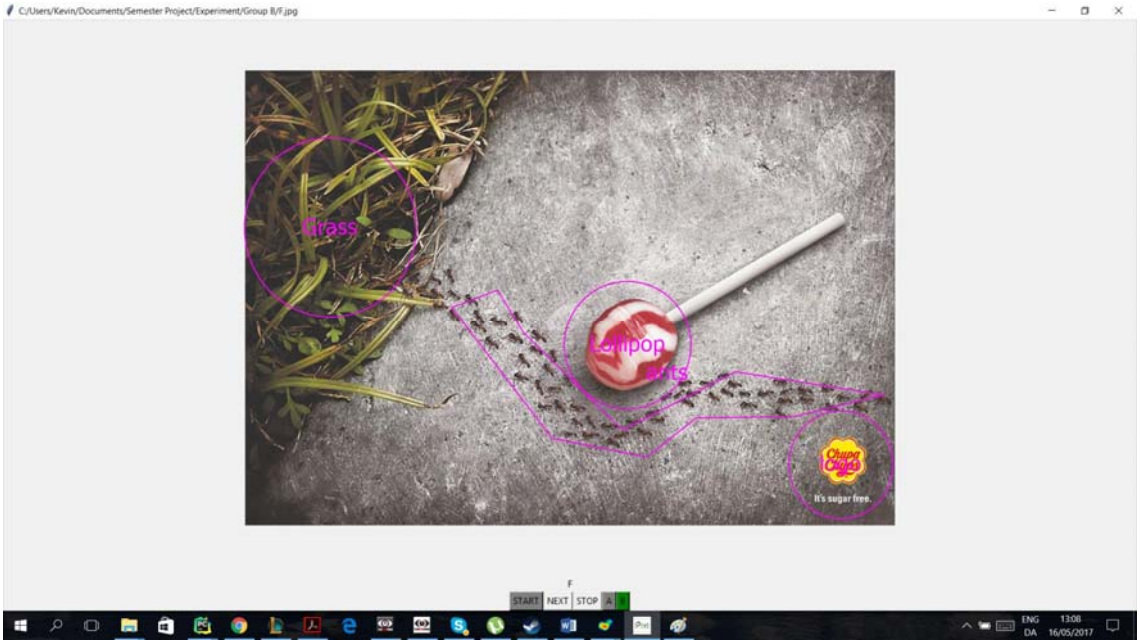


Figure 12 The Highlighted Shapes are the areas of interest that were defined in this specific image

Table 2

Stimulus	Areas of interest				
McDonalds Ad	Fries	Brand			
Chupa Chups Ad	Ants	Lollipop	Grass	Brand	
Pedigree Ad	Man Frame1	Man Frame 2	Dog	Brand	Text
Weight Watchers Ad	Large Door	Skinny Door	Brand		
Nivea Ad	Girl Face	Wrinkles	Brand		

Implementation

The implementation of this project consists mainly of two software solutions.

- A software in which to conduct the eye-tracking experiment
- A software used to analyse narrative responses

In this chapter, an overview of the process and challenges of each solution is presented.

Eye-tracking software

Python was used to program the software in which the eye-tracking experiment was conducted. It is an extension of the work that I have done in a previous project. (Ruder, 2016). The software consists of three main features: Displaying the stimulus, User Interface and Eye-tracking.

User Interface

The user interface was programmed using Tkinter which is an open-source graphical user interface (GUI) programming toolkit for Python (Python Wiki, 2016). The user-interface (UI) is shown in figure 13. The UI contains a start and stop button which is used to initiate and conclude the logging of the eye-tracker data. The next button is used to cycle through to the next image. The buttons A and B are used to define whether the subject belongs to group A or group B in the experiment. The images that are presented to the subjects differ according to their group.

Displaying the stimulus

The cycling of the images is created using Py-slideshow which is an open-source Python project. Py-slideshow is built using Tkinter. Originally, Py-slideshow is programmed so that users can define a time-delay between images, this was not suited towards the experiment, more control was necessary. Alterations were made to the code in order to have the stimulus cycle according to a trigger rather than based on a timer.

Eye-tracking

The eye-tracking was programmed using Peye-tribe (Baekgaard, 2014). The software is programmed in a manner that the eye-tracking is performed in separate threads to prevent blocking the main thread. The collected data from the eye-tracker is stored in a CSV file which is named according to the displayed stimulus. A CSV file is created for each condition of the experiment. The start and stop button are used to control whether the eye-tracker is recording or not.

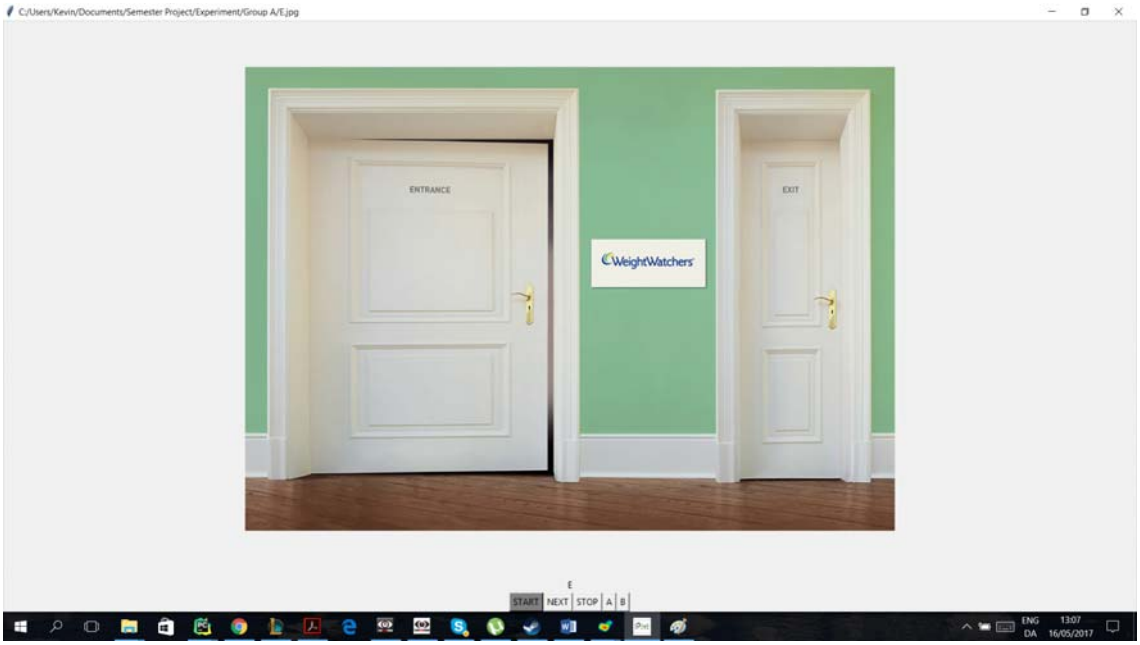


Figure 13 Implementation of the user-interface

Modifications to the software

While quite a few minor changes were done to the code, there are a few changes that are worth mentioning.

The interface was changed to allow for between-group testing through the implementation of the "A" and "B" buttons.

The method used to create files for each test-subject was previously done using a recursive function. This created an issue once the number of subjects reached 10. In this current iteration, the method was changed to make use of a for-loop instead.

The randomization of images which had been implemented in a previous iteration has been removed for the sake of the experiment. The source-code for the implementation can be found in the digital appendix in the folder "Code /NoQuestionnaire".

Narrative analysis

The software for narrative analysis was written in python and largely revolves around Gensim which is a python library for topic modelling.

A stop-word list is used in order to prevent any text-analysis methods from making use of invaluable words such as "in", "and", and "or" which provide no information about the text. A stop word list is a

list of words which are chosen to be ignored by the algorithm. A python library was used to define the English stop-word list. (Alir3z4, 2017)

The data from the questionnaire is imported as a CSV file and converted to documents using Python's CSV library.

The documents are tokenized meaning that they are separated into individual word. Words that only occur once are not accounted for. These words are then fit into a bag of words model which is used to calculate the frequency of the defined tokens in each of the documents. (Hurek, Corpus-formats, 2017)

Gensim is then used to compute the term-frequency inverse document freqency (TFIDF) as well as a Latent Dirichlet Allocation model (LDA). LDA is chosen over latent semantic analysis (LSA) because the results are easier to interpret. (Hurek, Latent Dirichlet allocation, 2017)

The software implementation does not contain a user-interface and the required results are simply extracted from the console. An example of the results can be seen in figure 14.

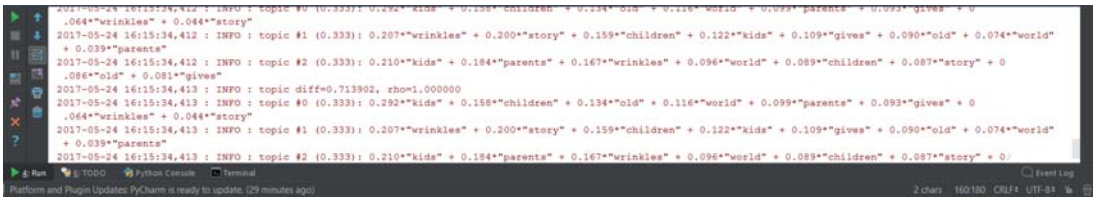


Figure 14 Example of the results that were displayed in the console

Results

The results chapter is split into two segments. The first segment will present the data collected from the eye-tracker. During this chapter, the group in which the anchors are present will be referred to as group A and the group in which the anchors are not present will be referred to as group NA. The second segment will look into the results collected from the text-analysis that was performed on the questionnaire results. 30 samples were collected, 15 of them belonging to group A and 15 of them belonging to group NA.

Eye-tracker Data

The raw eye-tracking data was extracted as a CSV file and processed in Ogama. Ogama Is an open source software used to analyze eye and mouse movements (Ogama, 2016). In this experiment, a fixation is specified as a gaze staying within a 20-pixel radius for at least 5 samples. Once the data had been processed in Ogama it was exported to MATLAB for statistical analysis. Excel was also used as a tool for graphing the data. The eye-tracking data as well as Excel, Ogama and Matlab files can all be found in the digital appendix.

Table 3 and 4 provide an overview of some of the eye-tracking data collected using the eye-tribe. The measurement for fixation duration is milliseconds. The fixation count is the number of times a fixation occurred.

A test for normality was conducted on the fixation duration mean using a Lilliefors test. Most of the samples had a normal distribution meaning that parametric tests were used in the analysis of the data. The results of the Lilliefors test can be found in the digital appendix under the folder “Data”.

Table 3

No Anchor						
	Mean Fixation Duration mean	Mean Fixation Duration Median	Mean Fixation Count / second	Mean Fixation count	Mean Average saccade length	Mean Average saccade velocity
Mc Donalds Ad	447.867	370.933	1.667	30.000	197.267	1.933
Chupa Chups Ad	317.333	246.533	2.000	45.400	228.200	2.400
Weight Watchers Ad	317.867	246.600	1.933	40.600	325.533	2.867
Nivea Ad	333.933	247.800	2.000	34.533	217.667	2.533
Pedigree Ad	308.867	257.667	1.933	37.600	353.267	3.400

Table 4

Anchor						
	Mean Fixation Duration mean	Mean Fixation Duration Median	Mean Fixation Count / second	Mean Fixation count	Mean Average saccade length	Mean Average saccade velocity
Mc Donalds Ad	488.733	345.467	1.600	22.267	349.800	2.867
Chupa Chups Ad	322.400	254.067	1.933	35.667	233.467	2.600
Weight Watchers Ad	317.200	247.533	1.867	27.867	342.333	3.400
Nivea Ad	329.133	237.800	1.733	36.467	209.733	2.000
Pedigree Ad	323.133	239.000	1.867	33.267	292.733	2.733

An independent t-test was conducted to see whether there was a significant difference between the mean fixation duration between conditions A and NA. The results of the test are show in table 5.

Table 5 H = 0 indicates a failure to reject the null hypothesis that the data comes from independent random samples from normal distributions with equal means and equal but unknown variances

	H	P
Mc Donalds Ad	0	0.7617
Chupa Chups Ad	0	0.6336
Weight Watchers Ad	0	0.9398
Nivea Ad	0	0.6237
Pedigree Ad	0	0.3133

The independent t-test is an indication that there is no significant difference between the mean fixation duration in condition A and condition NA.

Normal distribution probability density functions (PDF) were plotted for the fixation duration mean of both conditions in each Ad. These can be found in appendix C. The PDF for the McDonalds ad was a pretty strong indication that this specific data was not normally distributed, so a Wilcoxon signed-rank test was used to check whether there was a statistical significant difference between conditions A and NA for the McDonalds Ad. The results are shown in table 6 and it remained the same, there was no significant difference between the mean fixation duration in conditions A and NA. Figure 17 shows the mean fixation duration for each level of narrativity across the two conditions.

Table 6 Wilcox signed rank test result

	H	P
McDonalds Ad	0	0.4796

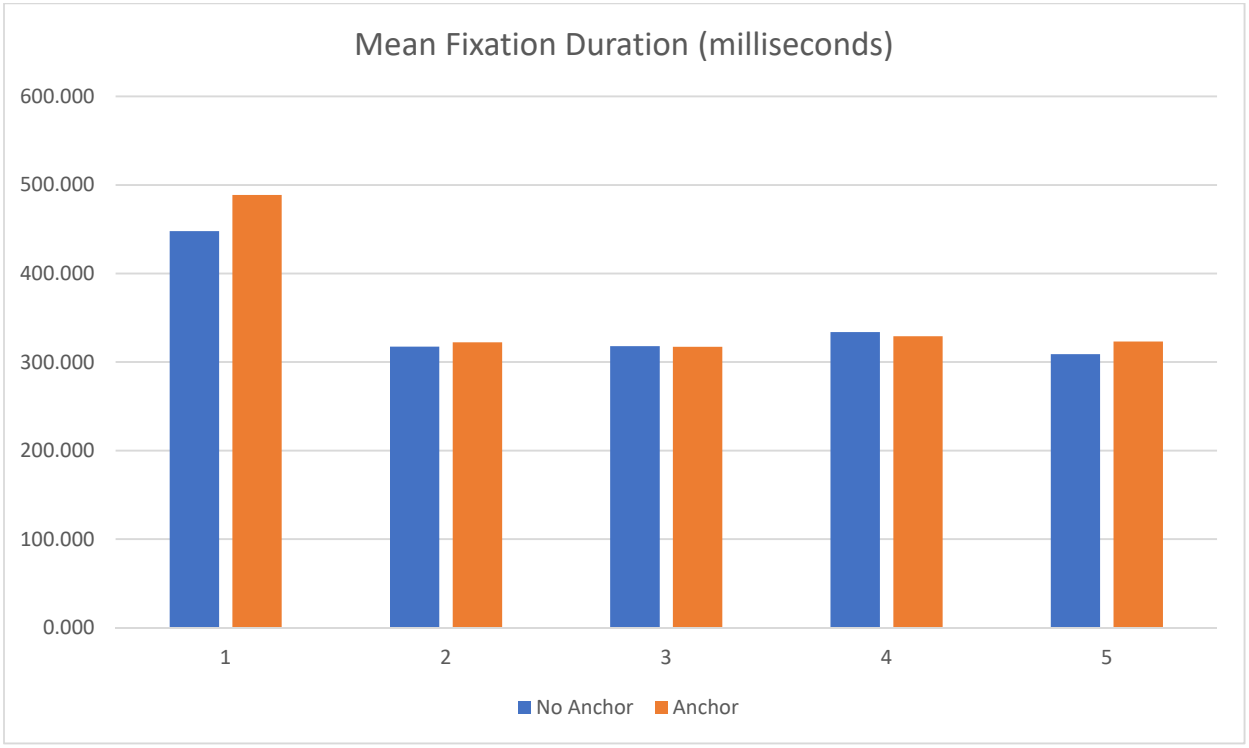


Figure 15 Mean fixation duration according to level of narrativity

Earlier in the report, areas of interest were defined with the purpose of being able to create a better understanding of how individual visual elements are perceived in the image. Table 7 and 8 present an overview of the eye-metrics captured for each area of interest.

Table 7

Anchor		
McDonalds Ad	Fixation Count	Fixation Duration
Fries	9.533	387.533
Brand	3.133	353.133
Chupa Chups Ad	Fixation Count	Fixation Duration
Ants	3.867	189.600
Lollipop	8.600	260.800
Grass	4.267	240.067
Brand	3.733	405.467
Weight Watchre	Fixation Count	Fixation Duration
Large Door	9.667	283.400
Small Door	5.467	311.533
Brand	3.467	241.067
Nivea Ad	Fixation Count	Fixation Duration
Girls Face	1.800	241.000
Wrinkles	13.000	258.733
Brand	9.667	384.933
Pedigree Ad	Fixation Count	Fixation Duration
Man Frame 1	4.133	269.667
Man Frame 2	5.067	209.067
Dog	2.867	258.800
Text	3.200	334.867
Brand	1.467	271.000

Table 8

No Anchor		
McDonalds Ad	Fixation Count NA	Fixation Duration NA
Fries	19.600	350.267
Brand		
Chupa Chups Ad	Fixation Count NA	Fixation Duration NA
Ants	7.867	317.133
Lollipop	13.267	295.800
Grass	5.133	195.133
Brand		
Weight Watchre	Fixation Count NA	Fixation Duration NA
Large Door	19.800	305.867
Small Door	11.467	282.067
Brand		
Nivea Ad	Fixation Count NA	Fixation Duration NA
Girls Face	3.800	283.400
Wrinkles	12.400	318.733
Brand		
Pedigree Ad	Fixation Count NA	Fixation Duration NA
Man Frame 1	8.200	248.667
Man Frame 2	8.400	248.467
Dog	3.467	302.733
Text		
Brand		

	No Anchor	Anchor	H	P
McDonalds Ad	Fixation Duration NA	Fixation Duration		
Fries	350.267	387.533	0	0.6235
Brand		353.133		
Chupa Chups Ad	Fixation Duration NA	Fixation Duration		
Ants	317.133	189.600	1	0.0098
Lollipop	295.800	260.800	0	0.0573
Grass	195.133	240.067	0	0.3373
Brand		405.467		
Weight Watchre	Fixation Duration NA	Fixation Duration		
Large Door	305.867	283.400	0	0.512
Small Door	282.067	311.533	1	0.0174
Brand		241.067		
Nivea Ad	Fixation Duration NA	Fixation Duration		
Girls Face	283.400	241.000	0	0.6065
Wrinkles	318.733	258.733	1	0.0247
Brand		384.933		
Pedigree Ad	Fixation Duration NA	Fixation Duration		
Man Frame 1	248.667	269.667	0	0.5878
Man Frame 2	248.467	209.067	0	0.3774
Dog	302.733	258.800	0	0.5216
Text		334.867		
Brand		271.000		

Figure 16 T-test results when comparing mean fixation duration across conditions

An independent t-test was conducted to detect whether there was a statistical significant difference between the mean fixation count and the mean fixation duration on the areas of interest across test conditions. H=0 indicates that the null hypothesis ("means are equal") cannot be rejected at the 5% significance level. Tables 16 and 17 shows that across all conditions with the exception of the McDonalds ad there was a statistical significant difference in at least one element in either the fixation count or fixation duration.

	No Anchor	Anchor	H	P	
McDonalds Ad	Fixation Count NA	Fixation Count			
Fries	19.600	9.533	0	0.1998	
Brand		3.133			
Chupa Chups Ad	Fixation Count NA	Fixation Count			
Ants	7.867	3.867	0	0.1834	
Lollipop	13.267	8.600	0	0.084	
Grass	5.133	4.267	0	0.6431	
Brand		3.733			
Weight Watchre	Fixation Count NA	Fixation Count			
Large Door	19.800	9.667	1	0.0329	
Small Door	11.467	5.467	1	0.0174	
Brand		3.467			
Nivea Ad	Fixation Count NA	Fixation Count			
Girls Face	3.800	1.800	0	0.0667	
Wrinkles	12.400	13.000	0	0.8348	
Brand		9.667			
Pedigree Ad	Fixation Count NA	Fixation Count			
Man Frame 1	8.200	4.133	1	0.0392	
Man Frame 2	8.400	5.067	1	0.1128	
Dog	3.467	2.867	0	0.6071	
Text		3.200			
Brand		1.467			

Figure 17 T-test results when comparing mean fixation count between conditions

Level of narrativity	Fixation Duration on brand
1	353.133
2	405.467
3	241.067
4	384.933
5	271.000

Figure 18 Fixation duration on brand according to level of narrativity

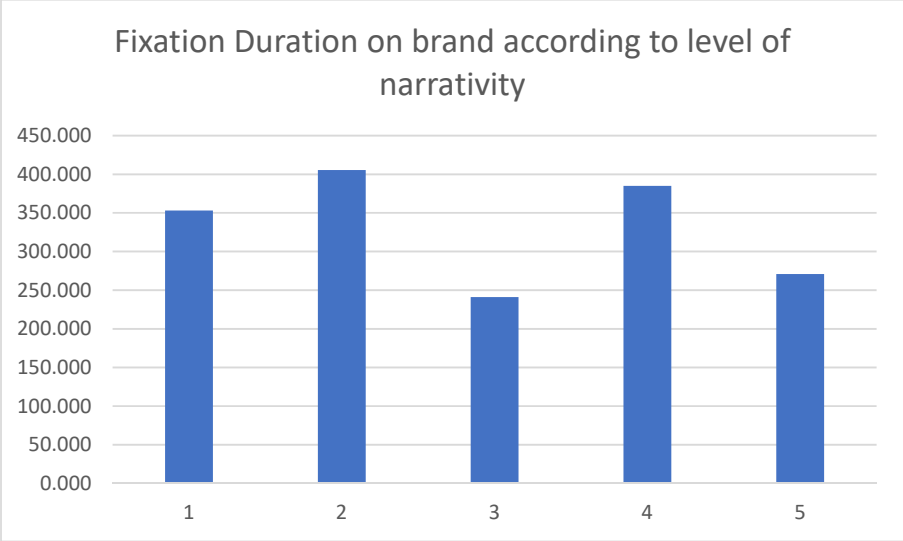


Figure 19 Fixation duration on brand according to level of narrativity

The fixation duration according to level of narrativity is shown in figure 21. It would seem that the subject is less likely to focus on the brand when looking at images with a high degree of narrativity. The only exception here is the Nivea ad, however it is also the only ad in which the brand is represented on a product rather than just a logo.

Text analysis.

A spell check was conducted on the responses before analysing them. As described in the implementation a latent dirichlet allocation (LDA) model was used to extract topics from the responses. The results extracted from the LDA are presented according to each ad. 3 topics were selected for extraction, the left column are the words which comprise the topic and the numbers to their right are the probability of their occurrence within the topic. In other words, it is a numerical indication of the words contribution to the specific topic. To facilitate comprehension, the experiment condition in which an anchor is present will be referred to as condition A and the condition in which an anchor is not present will be referred to as condition NA. In appendix A, a pie chart is presented for each of the topics in both conditions A and NA. This provides a graphical overview of the words and their contribution to each topic.

Mc Donald's Ad LDA results

Table 9

McDonald's No Anchor							
Topic 1			Topic 2			Topic 3	
wifi	0.469		wifi	0.147		wifi	0.245
fries	0.227		fries	0.073		fries	0.094
mc	0.103		mc	0.073		mc	0.204
free	0.082		free	0.214		free	0.189
person	0.031		person	0.158		person	0.068
gets	0.03		gets	0.124		gets	0.066
someone	0.029		someone	0.123		someone	0.068
data	0.029		data	0.087		data	0.066
McDonalds Anchor							
Topic 1			Topic 2			Topic 3	
free	0.272		free	0.153		free	0.122
fries	0.243		fries	0.068		fries	0.144
wifi	0.162		wifi	0.497		wifi	0.127
french	0.106		french	0.069		french	0.135
suddenly	0.09		suddenly	0.061		suddenly	0.063
story	0.069		story	0.053		story	0.115
restaurant	0.029		restaurant	0.049		restaurant	0.147
icon	0.029		icon	0.049		icon	0.147

From looking at the table 9, it is quite clear that many of the same words are present across the topics in both the condition with and without the anchor. There also seems to be very little semantic difference between condition A and condition NA.

Chupa Chups Ad LDA results

Table 10 LDA results for Chupa Chups Ad

Chupa Chups No Anchor							
Topic 1			Topic 2			Topic 3	
kind	0.189		dropped	0.162		candy	0.148
ants	0.183		lolipop	0.141		walking	0.146
candy	0.146		someone	0.126		lolipop	0.1
lot	0.07		eating	0.083		sweet	0.094
avoiding	0.069		avoid	0.082		ants	0.081
avoid	0.068		avoiding	0.078		bad	0.072
lollipop	0.043		sweet	0.076		avoid	0.071
dropped	0.042		ants	0.061		dropped	0.067
sweet	0.04		candy	0.047		eating	0.063
walking	0.039		kind	0.04		lot	0.062
Chupa Chups Anchor							
Topic 1			Topic 2			Topic 3	
lollipop	0.192		sugar	0.2		story	0.161
dropped	0.1		ants	0.138		since	0.111
since	0.088		free	0.136		natures	0.104
street	0.081		contains	0.08		natures	0.072
ants	0.073		lolipop	0.061		sugar	0.072
image	0.072		take	0.061		ants	0.054
lollypop	0.069		avoiding	0.057		lollipop	0.052
sugar	0.047		lollypop	0.052		avoiding	0.051
free	0.041		avoid	0.05		avoiding	0.05
story	0.039		story	0.027		free	0.042

When looking at condition NA in table 10, once again there seems to be little semantic difference between the three topics. However, the probability of the words in topic 2 perhaps explain the narrative from the perspective of a person who dropped a lollipop while topic 1 perhaps has a narrative perspective from the ants.

In condition A, once the anchor is present, the original message of the ad, which is a sugar free lollipop, seems to be better understood. This is seen by the presence of the words “sugar” and “free”. Also in condition A, a difference can be seen in the probability of the words between the topics. Topics 2 and 3 seem to have emphasis on the ants and nature, while topic 1 could be interpreted to have the perspective of a person who dropped a lollipop.

Weight Watchers LDA results

Table 11 Weight Watchers LDA results

Weight Watchers No Anchor							
Topic 1			Topic 2			Topic 3	
easier	0.101		fat	0.112		one	0.102
get	0.081		door	0.098		always	0.091
will	0.08		behind	0.091		door	0.081
like	0.069		people	0.083		closed	0.081
can	0.059		wider	0.078		open	0.069
doors	0.058		open	0.071		bigger	0.065
wider	0.051		story	0.061		doors	0.057
story	0.051		big	0.057		easier	0.053
sort	0.049		opportunit	0.057		big	0.051
door	0.036		bigger	0.056		sort	0.05
Weight Watchers Anchor							
Topic 1			Topic 2			Topic 3	
will	0.059		difference	0.057		please	0.059
company	0.057		entrance	0.056		person	0.055
loose	0.054		wide	0.051		entered	0.051
can	0.051		sized	0.047		way	0.05
door	0.051		one	0.046		like	0.046
go	0.049		ad	0.046		able	0.046
service	0.049		fat	0.046		losing	0.045
thin	0.048		use	0.043		exit	0.04
see	0.041		doors	0.041		weight	0.04
lot	0.04		can	0.036		door	0.039

When Looking at condition NA in table 11, there seems to be very little coherence between the words within the topic, it is hard to make sense of any of the topics. However, in condition A, topics 1 and 3 seem to capture the conveyed message of the ad which is about losing weight.

Nivea Ad LDA results

Table 12 Nivea LDA results

Nivea No Anchor							
Topic 1			Topic 2			Topic 3	
old	0.237		children	0.246		kids	0.283
wrinkles	0.209		wrinkles	0.193		gives	0.168
kids	0.209		story	0.139		world	0.141
story	0.102		parents	0.137		children	0.127
world	0.077		kids	0.119		story	0.101
children	0.062		old	0.059		parents	0.092
parents	0.053		world	0.057		wrinkles	0.045
gives	0.052		gives	0.051		old	0.044
Nivea Anchor							
Topic 1			Topic 2			Topic 3	
child	0.095		wrinkles	0.126		anti	0.118
parents	0.091		gives	0.11		cream	0.091
kids	0.084		kids	0.109		nivea	0.079
can	0.081		children	0.092		wrinkles	0.076
stress	0.074		dad	0.076		stress	0.075
product	0.072		stress	0.06		parents	0.069
tough	0.071		will	0.057		children	0.067
will	0.066		cream	0.055		gives	0.066
dad	0.065		appear	0.05		can	0.062
wrinkles	0.047		children	0.045		will	0.062

The LDA results in table 12 indicate that the message interpreted by the subjects is largely uniform across conditions A and NA. The most noticeable difference will be in the inclusion of a product in condition NA, this is seen through words such as “product”, “cream” and “Nivea”.

Pedigree Ad LDA results

Table 13 Pedigree LDA results

Pedigree No Anchor							
Topic 1			Topic 2			Topic 3	
old	0.14		alone	0.149		alone	0.084
man	0.122		guy	0.104		guy	0.067
friend	0.114		story	0.094		friend	0.078
life	0.102		time	0.093		picture	0.059
dog	0.097		one	0.085		dog	0.07
picture	0.074		side	0.084		side	0.059
one	0.068		dog	0.066		used	0.059
lost	0.061		man	0.066		loosing	0.138
used	0.048		old	0.04		lost	0.059
story	0.034		friend	0.039		story	0.158
Pedigree Anchor							
Topic 1			Topic 2			Topic 3	
get	0.089		alone	0.083		lonely	0.097
old	0.066		gets	0.077		adopt	0.089
wife	0.065		side	0.073		man	0.079
will	0.064		can	0.064		especially	0.068
sad	0.055		get	0.06		dog	0.06
happy	0.053		sad	0.055		person	0.059
lonely	0.053		man	0.05		will	0.058
feel	0.045		life	0.049		can	0.054
least	0.045		dog	0.046		also	0.053
man	0.045		feel	0.043		pedigree	0.053

When looking at condition NA in table 13, it seems that once again there is very little semantic difference across the topics. Notice that in condition A, when the anchor is present, the brand pedigree appears in topic 3. All three topics in condition A seem to express a story that revolves around loneliness. While this is the case for topics 2 and 3 in condition NA, there seems to also be emphasis on friendship across all three topics in condition NA. The topic that seemingly contains highest level of narrativity would be topic 1 in condition A, with words such as sad and happy perhaps indicating a transformation. Topic 3 in condition A seems to best capture the essence of the ad which is to persuade people to adopt dogs.

Discussion of results

The addition of anchor seems to help people associate the picture with a specific brand or service. With the exception of the McDonalds ad, all of the LDA results seemed to indicate that the anchor refined the understanding towards the intended message of the author. The ad with the lowest degree of narrativity, the McDonalds ad, seemed to be equally understood regardless of the presence of an anchor.

Also, when looking at the fixation duration and fixation count on areas of interest, the only ad in which there was no statistically significant difference was the McDonalds ad. Earlier in the report the following hypothesis was presented.

"*Print advertisements with high levels of narrativity are less susceptible to change in intelligibility and visual perception in the absence of anchors.*

The results indicate that perhaps this assumption was incorrect. The advertisement with the lowest level of narrativity was the one in which no significant change as noticed in both analysis methods. The anchor often serves the purpose of re-contextualizing the message of the ad. In an ad in which there is no anchor, the image itself contains the entire narrative. Once the anchor is present, the image becomes a tool for a large metaphor in which the anchor is a central piece. It is very likely that in ads where there is a low degree of narrativity, there is also less narrative-content for the anchor to re-contextualize. Thus, it makes sense that there is less of a change in intelligibility and gaze patterns in ads which have a lower degree of narrativity.

However, there are certain things that were not accounted for in the experiment that could perhaps have compromised the validity and reliability of the results. However, these issues will be discussed in the following chapter.

Discussion

There were a few things that were not accounted for in the experiment. For example, motivation was mentioned earlier in the report as something that could influence people's understanding of ads. People are different; thus, they have different motivations, however the larger the sample size, the less we can attribute any difference strictly to the individual variability. However, gender and age group might also have played an influence in people's motivation to look at the ad and this data was not gathered in the experiment. It would've been interesting to see whether there was a difference in intelligibility between gender and age groups.

Product familiarity and competence was also mentioned as two variables that could influence intelligibility. Again, these are two variables that were not accounted for and could potentially act as confounding variables. Given another iteration of the experiment, the questionnaire should include questions about the subject's familiarity with product as well as print ads in general.

The number of visual objects on the scene is also something that was not accounted for. The ad in which there was the least difference in eye-tracking data, the McDonald's ad, is also the one with the fewest visual elements. There is little room for change when there is only one visual element to look at. However, there is a possibility that the number of visual elements correlates with the degree of narrativity, the more visual objects there are in the image, the more potential narrative elements exist.

The assumption in this research is that while the experiment was conducted on a screen, the results would be translatable to a physical print. However, there's a possibility that gaze patterns are different when looking at a stimulus on screen and on paper. Given another experiment iteration, it would be ideal if the stimulus presented to the participants was shown in the form that print ads ussually exist, such as in magazines. This would allow for a more concrete generlization of the results.

In future iterations of the experiment, the level of narrativity would be better defined if categorized by a panel of experts rather than a single person. Alternatively, instead of using Ryan's model as the foundation for the categorization of the ads, it would also be interesting to look towards the typologies of visual rhetoric such as the ones presented by McQuarrie and Phillips.

Earlier in the report, the importance of analysing print ads before publishing them was emphasized. This report also provides a framework in which text analysis and eye-tracking are used as a method of doing so.

Given the research question that was posed earlier in the report:

How does the absence of anchors in print advertising influence the intelligibility and visual perception of print advertisements with different levels of narrativity?

The current experiment has shown that our initial hypothesis was incorrect.The degree of change in intelligibility and visual perception was lower in the ad with the lowest degree of narrativity. However there still room to improve on the experiment, and additional trials would improve the reliability of the experiment

Conclusion

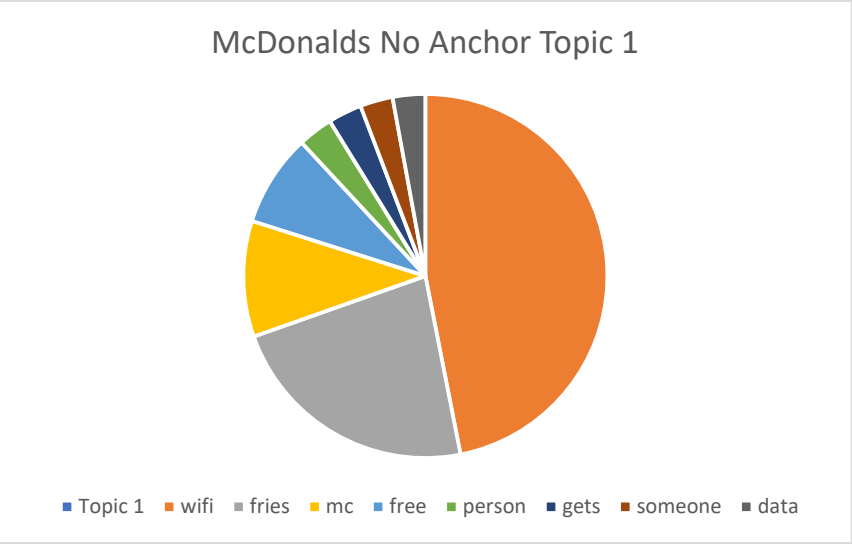
While currently not the most popular way of advertising, print ads are often an overlooked method of advertising. Their readers are usually highly engaged which increases the effectiveness of the ad. Print ads are also a great way of targeting specific markets. However, a challenge when working with print ads is that the consumer needs to correctly interpret the message which is being conveyed. Anchors are often used as a tool for re-contextualizing the message of the ad. Theories related to visual rhetoric and narratives were investigated to create an understanding how ads create meaning and narratives. The goal was to understand how anchors influence the intelligibility of ads and whether there was a difference when it came to their degree of narrativity. Thus, the following research question was posed:

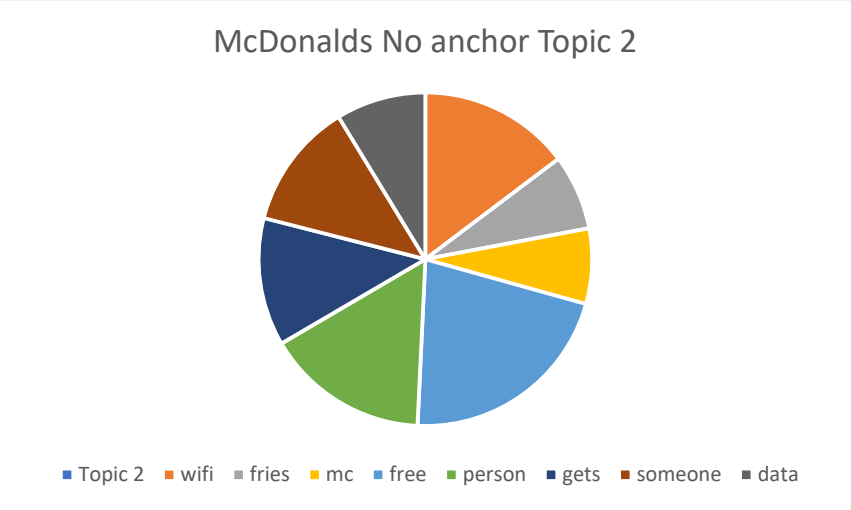
How does the absence of anchors in print advertising influence the intelligibility and visual perception of print advertisements with different levels of narrativity?

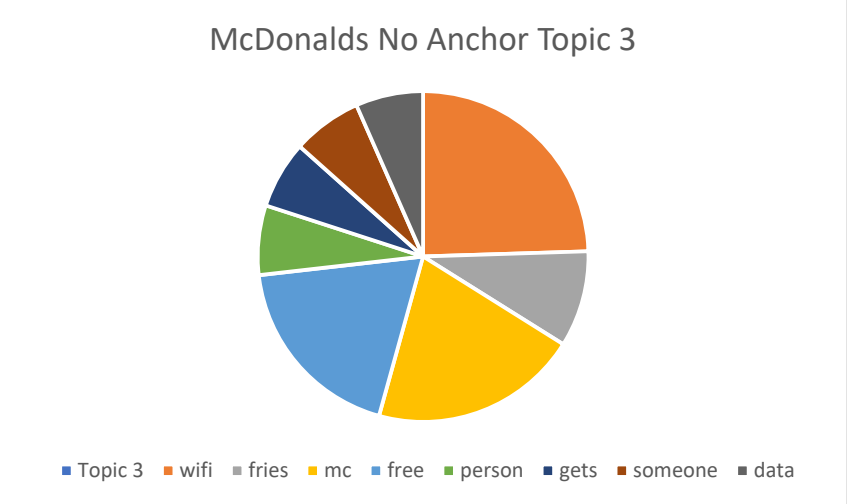
Ryan's narrative model was used a foundation for categorizing images in regards to their level of narrativity. An experiment that was conducted and the results show that the intelligibility of ads with low levels of narrativity are less likely to change in the presence of an anchor. This report also presents a framework in which eye-tracking and text-analysis are used as a means of analysing ads. The current analysis is done in regards to theories of narrativity, but it would definitely be interesting to look towards theories of visual rhetoric for future research.

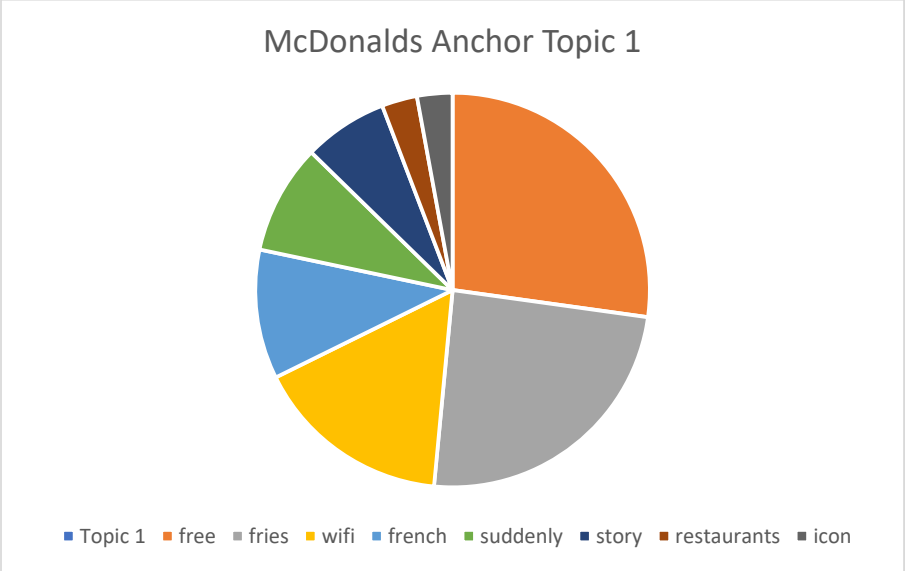
Appendix A

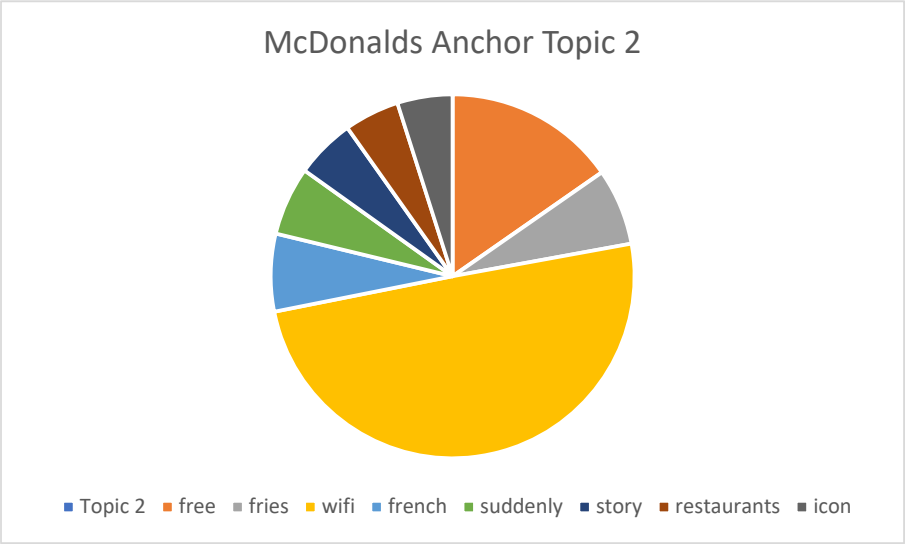
LDA Pie-chart McDonalds Ad

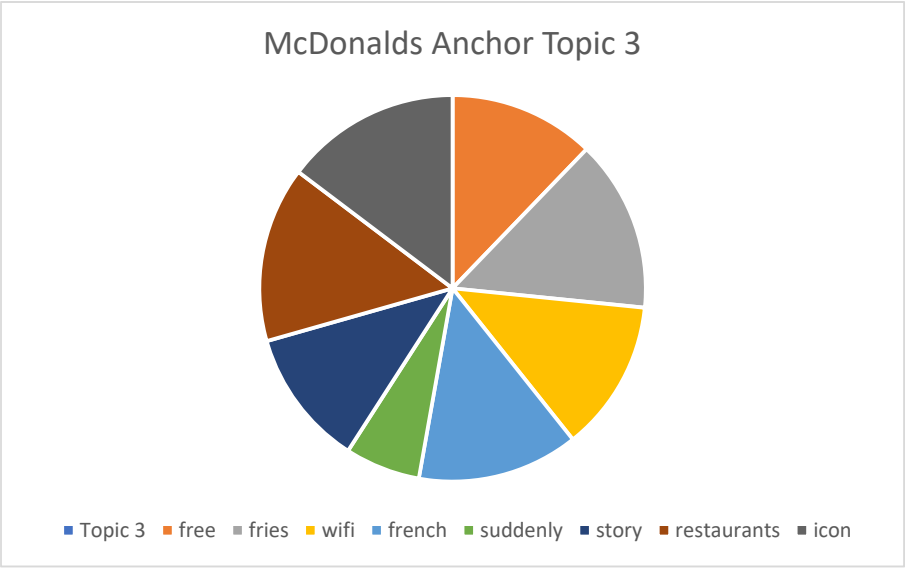




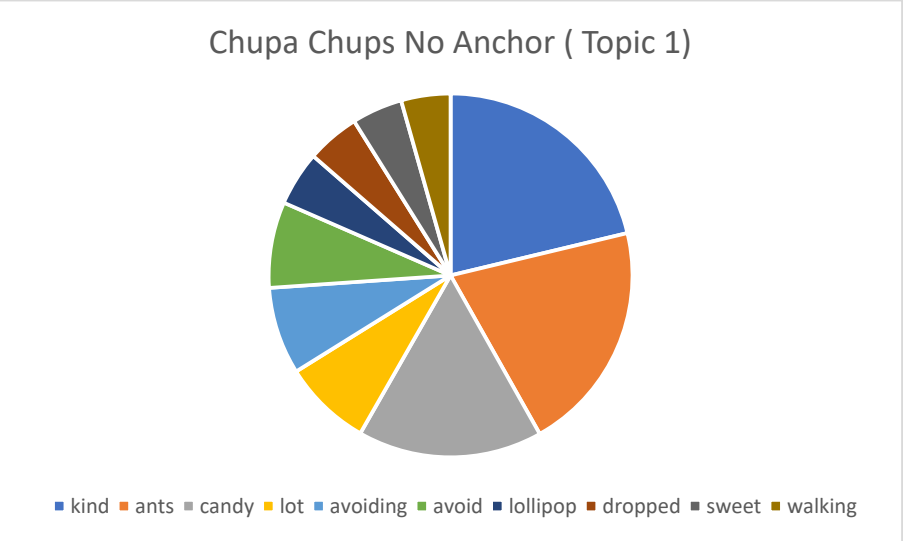


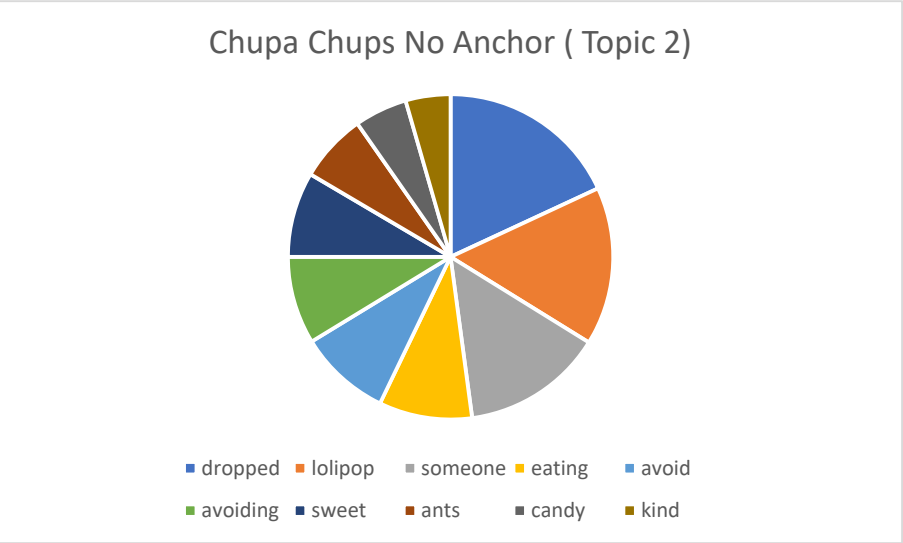

McDonalds Anchor Topic 1
Topic 1
free
fries
wifi
french
suddenly
story
restaurants
icon

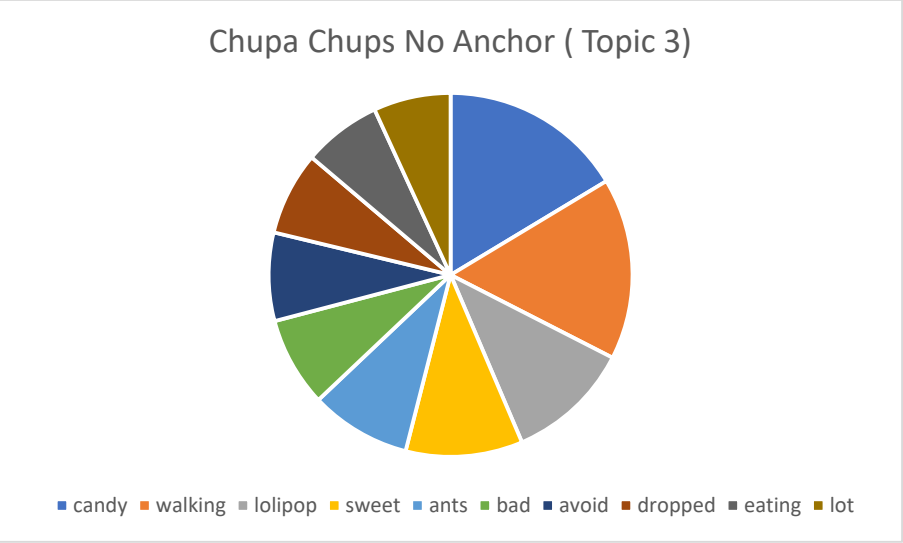

McDonalds Anchor Topic 2
Topic 2
free
fries
wifi
french
suddenly
story
restaurants
icon

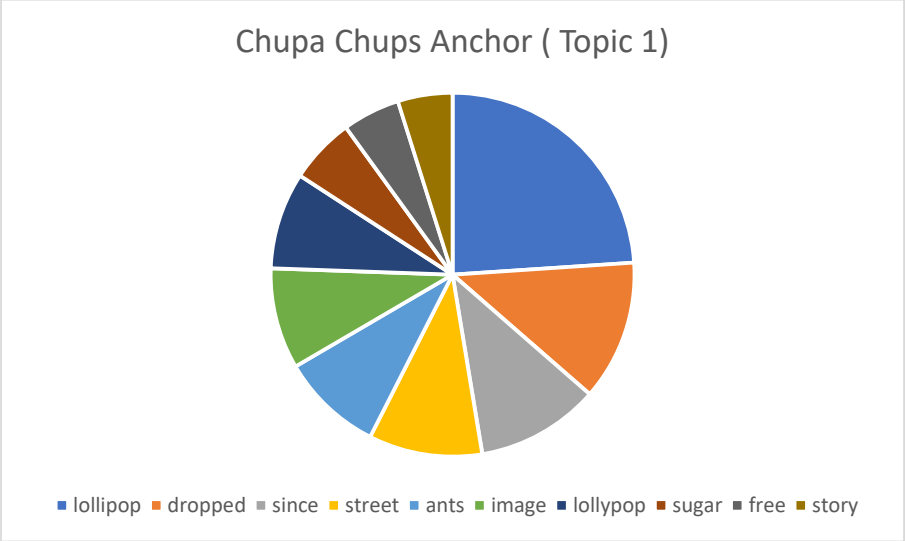

McDonalds Anchor Topic 3
Topic 3
free
fries
wifi
french
suddenly
story
restaurants
icon

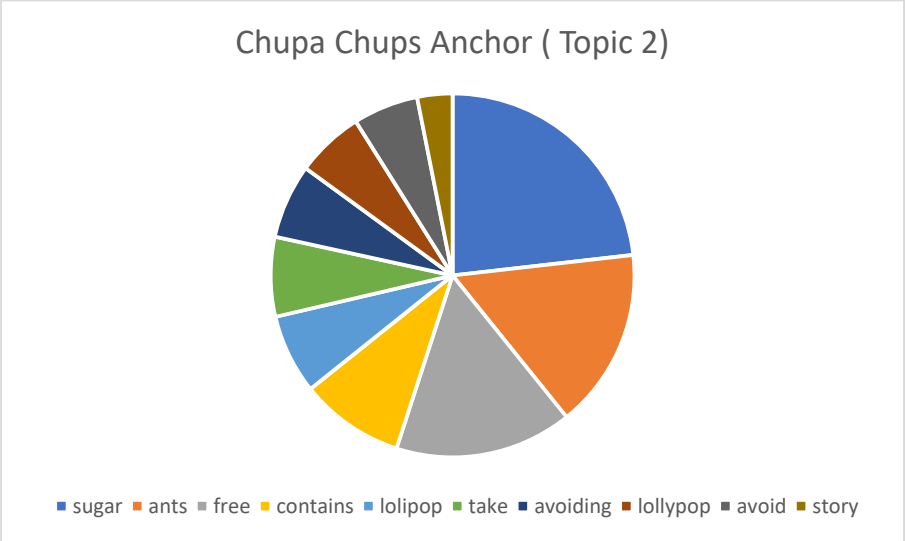
LDA Pie-chart Chupa Chups Ad

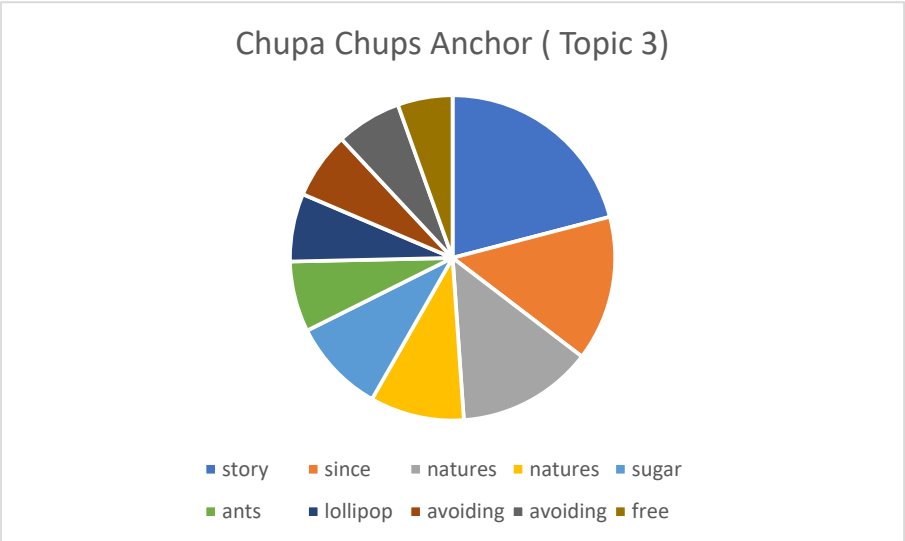




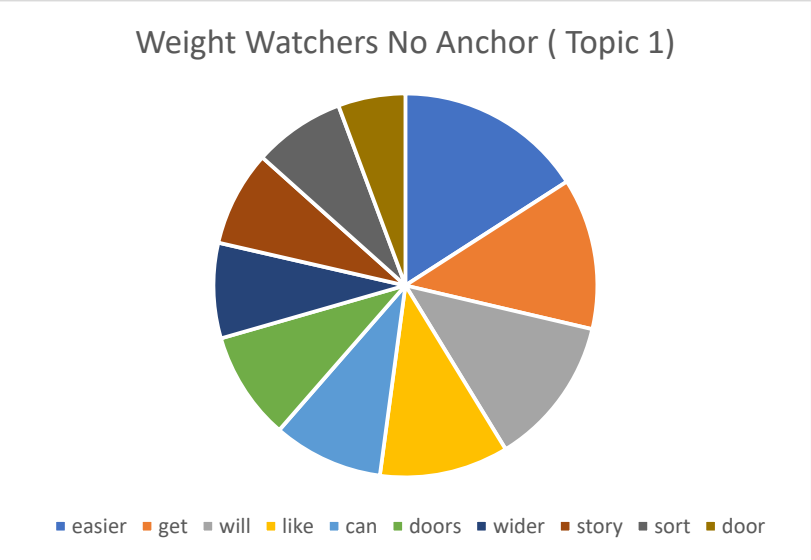


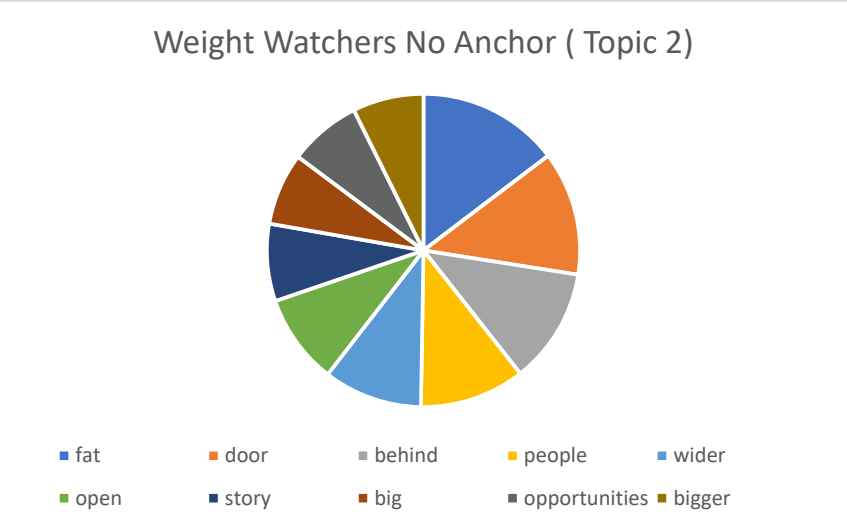

Chupa Chups Anchor (Topic 1)
lollipop dropped since street ants image lollypop sugar free story

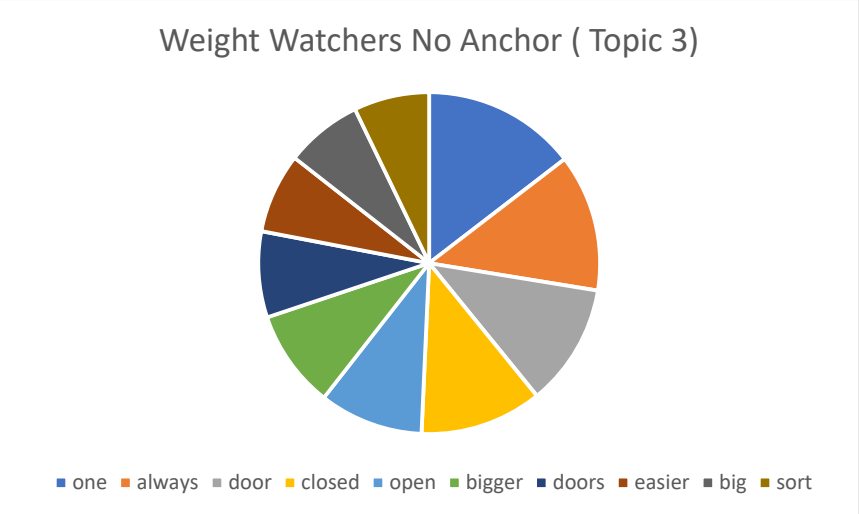

Chupa Chups Anchor (Topic 2)
sugar ants free contains lolipop take avoiding lollypop avoid story

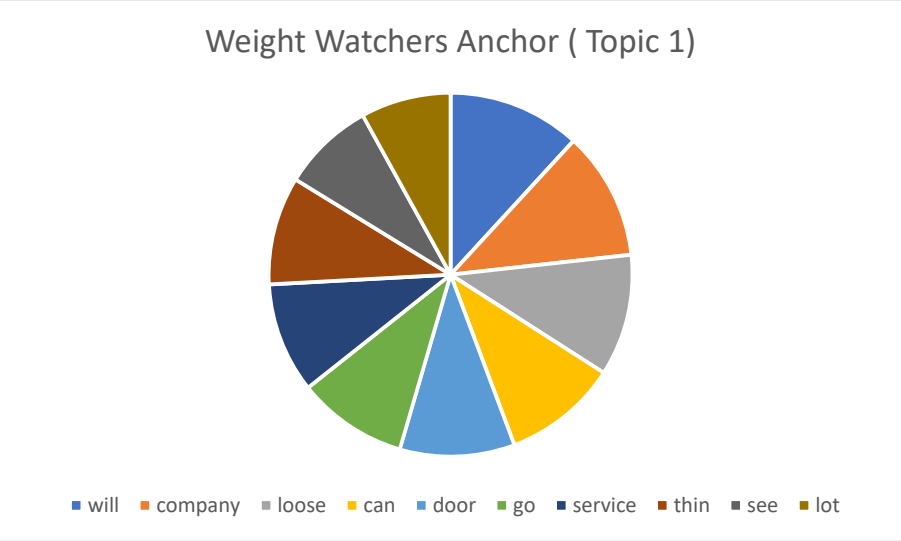

Chupa Chups Anchor (Topic 3)
story since natures natures sugar
ants lollipop avoiding avoiding free

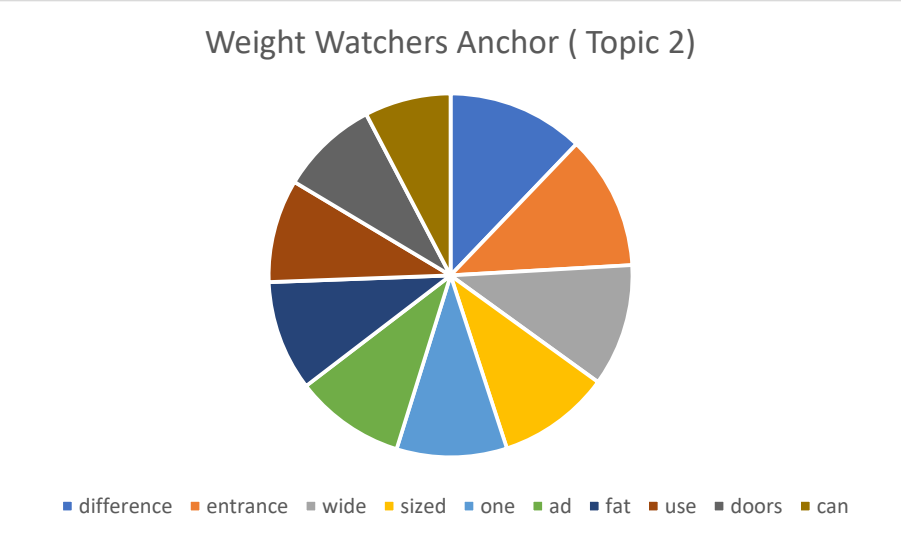
LDA Pie-chart Weight Watchers Ad

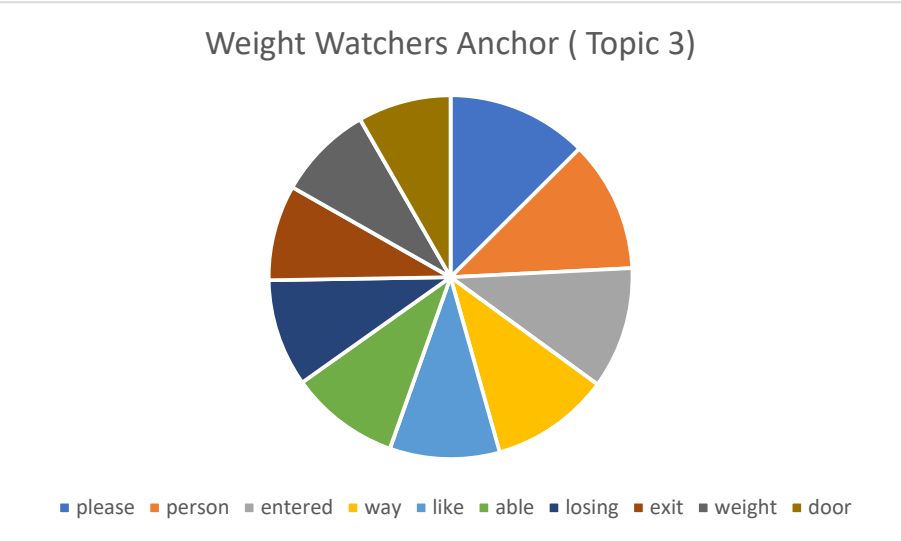




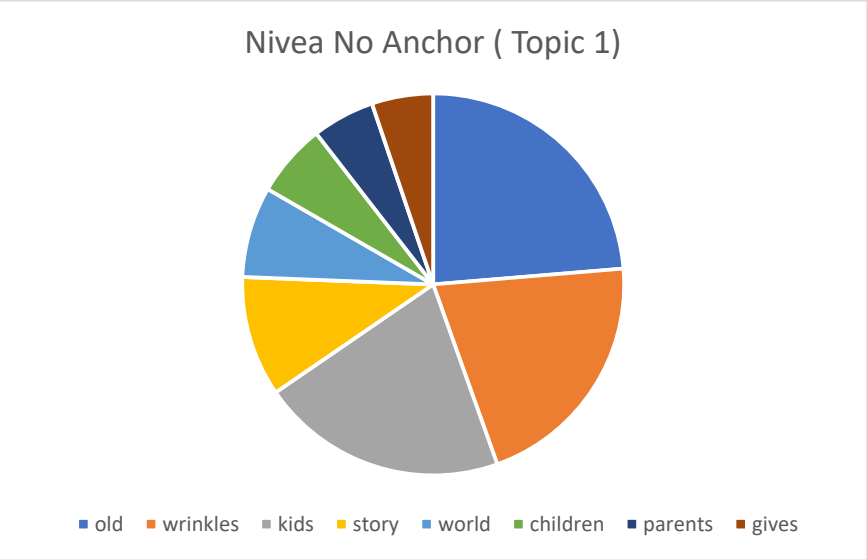


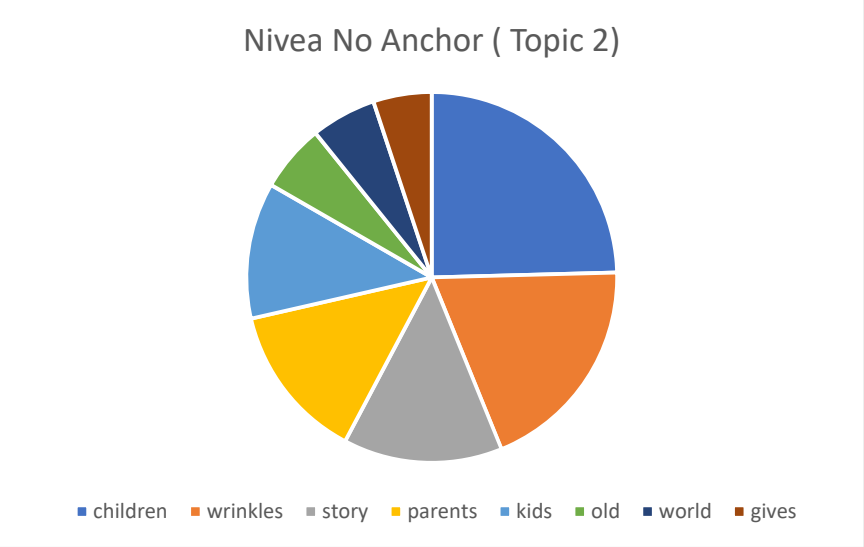

Weight Watchers Anchor (Topic 1)
will
company
loose
can
door
go
service
thin
see
lot

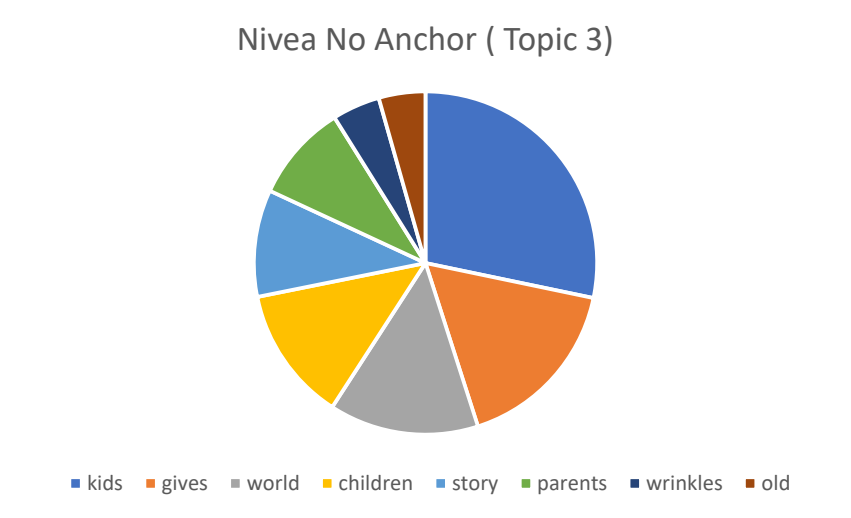

Weight Watchers Anchor (Topic 2)
difference
entrance
wide
sized
one
ad
fat
use
doors
can

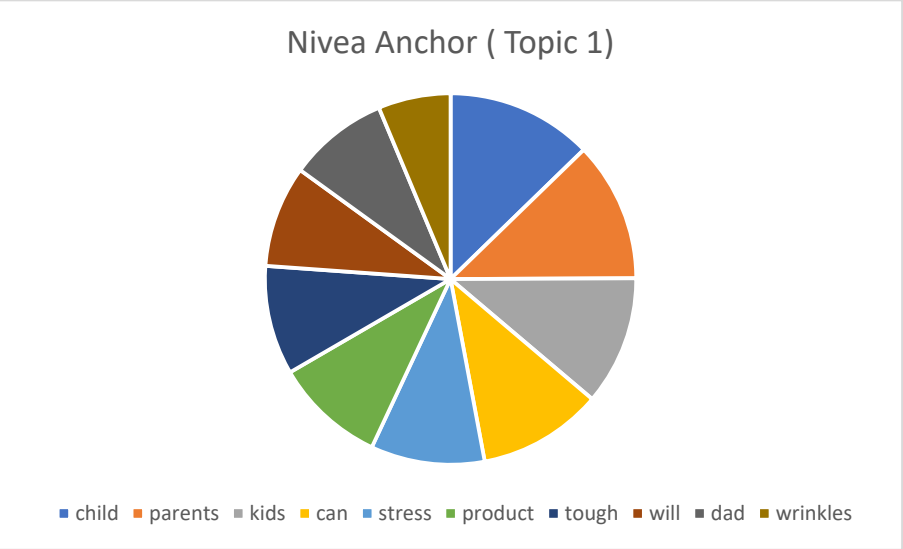

Weight Watchers Anchor (Topic 3)
please
person
entered
way
like
able
losing
exit
weight
door

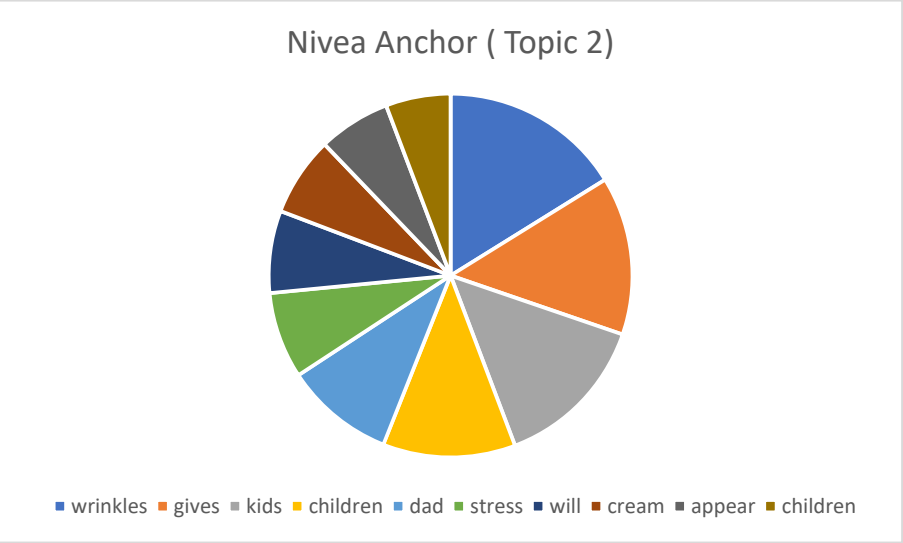
LDA Pie-chart Nivea Ad

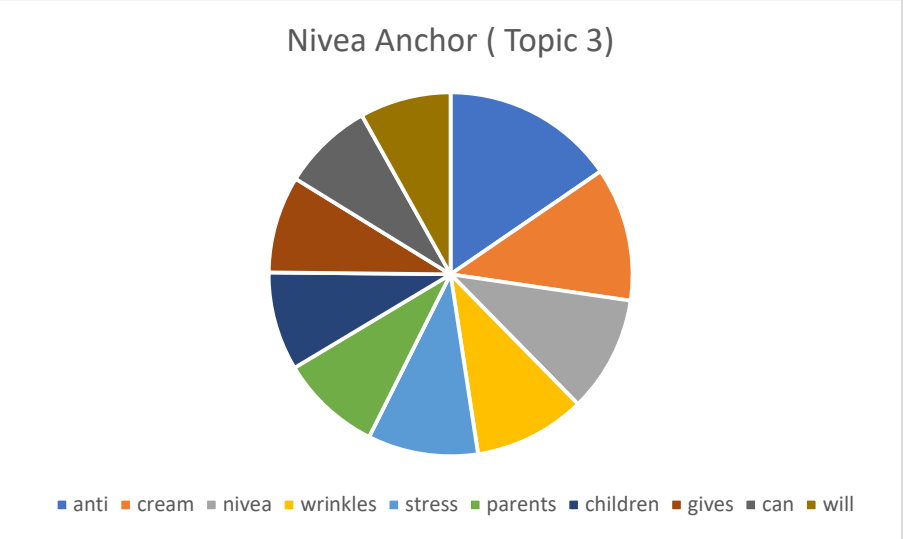




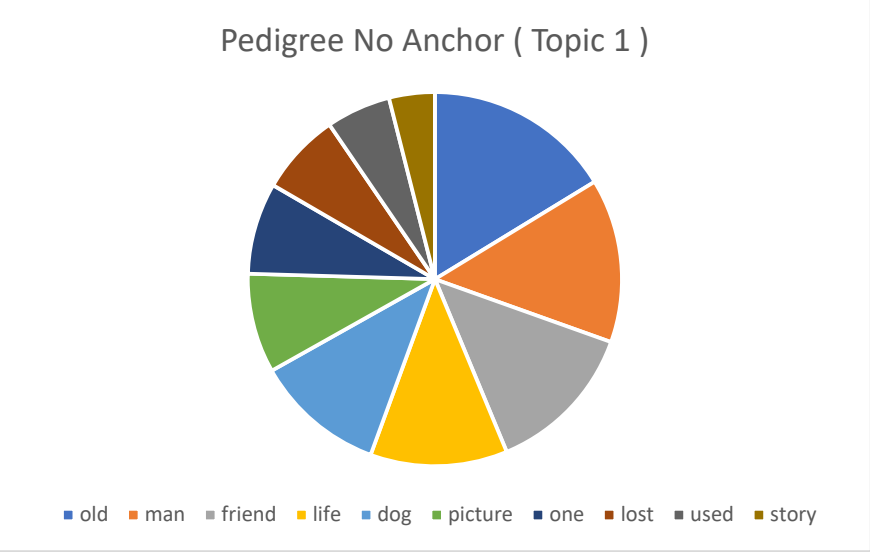


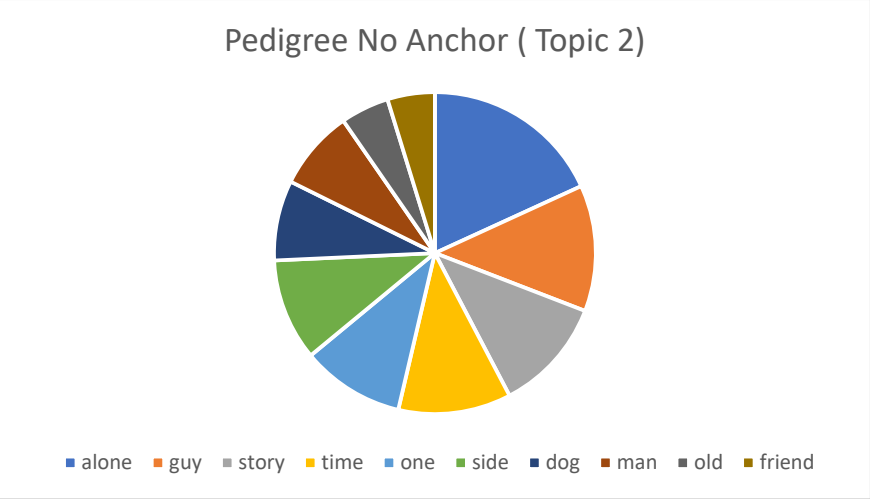

Nivea Anchor (Topic 1)
child
parents
kids
can
stress
product
tough
will
dad
wrinkles

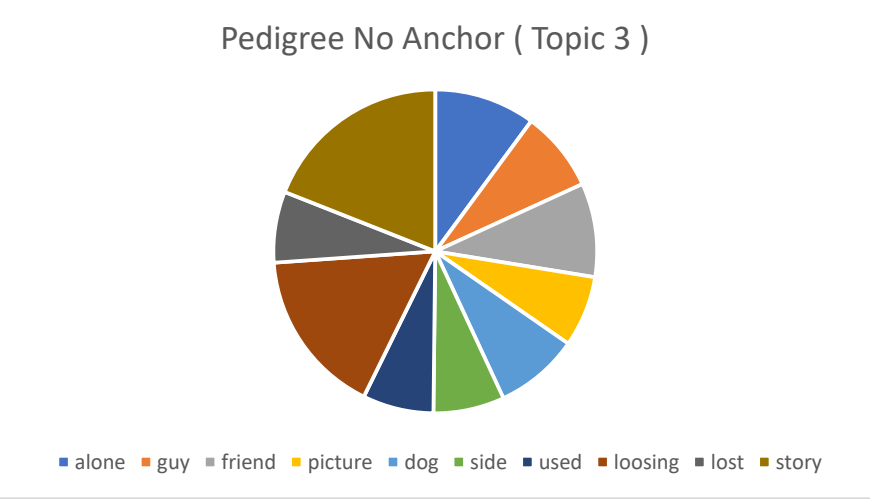

Nivea Anchor (Topic 2)
wrinkles
gives
kids
children
dad
stress
will
cream
appear
children

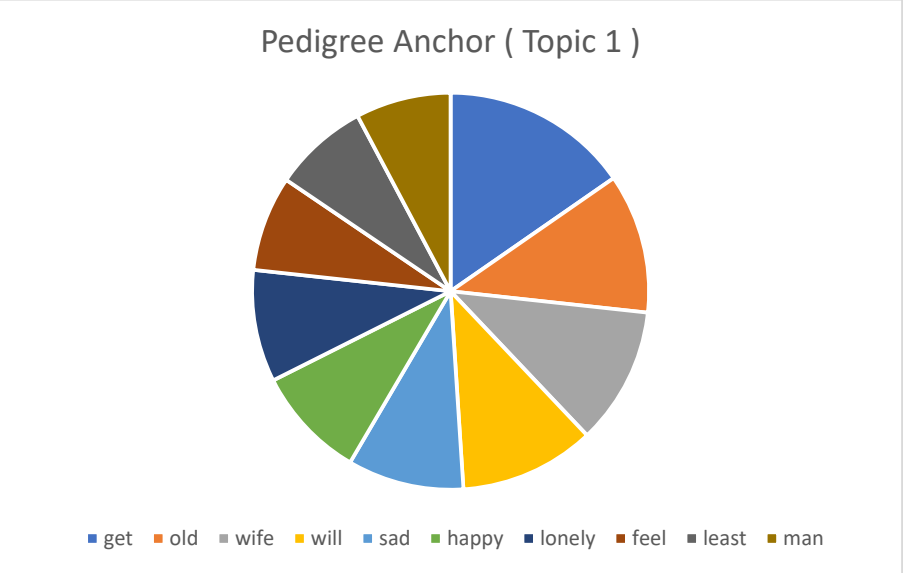

Nivea Anchor (Topic 3)
anti
cream
nivea
wrinkles
stress
parents
children
gives
can
will

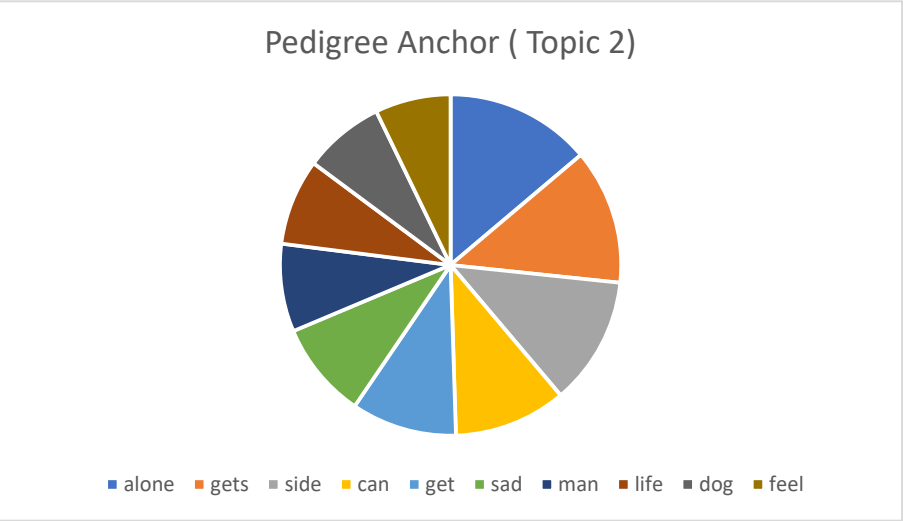
LDA Pie-chart Pedigree Ad

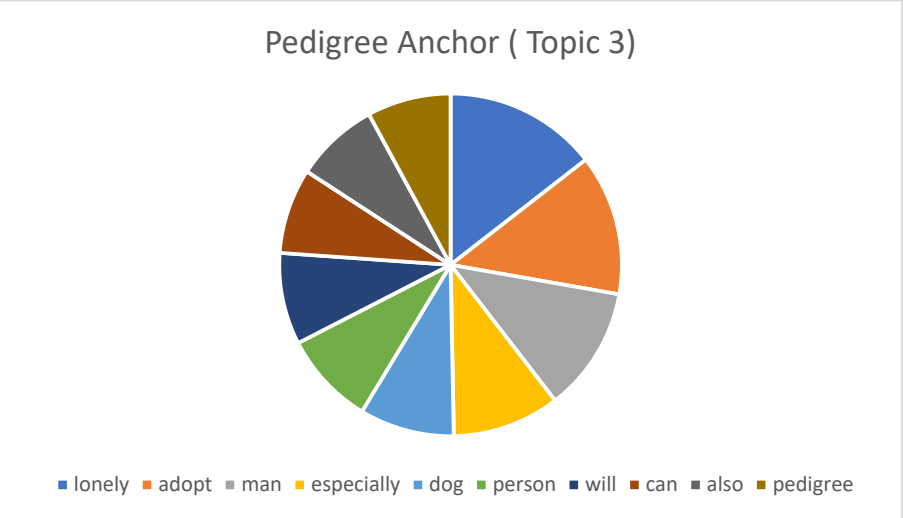







Pedigree Anchor (Topic 1)
get
old
wife
will
sad
happy
lonely
feel
least
man


Pedigree Anchor (Topic 2)
alone
gets
side
can
get
sad
man
life
dog
feel


Pedigree Anchor (Topic 3)
lonely
adopt
man
especially
dog
person
will
can
also
pedigree

Appendix B

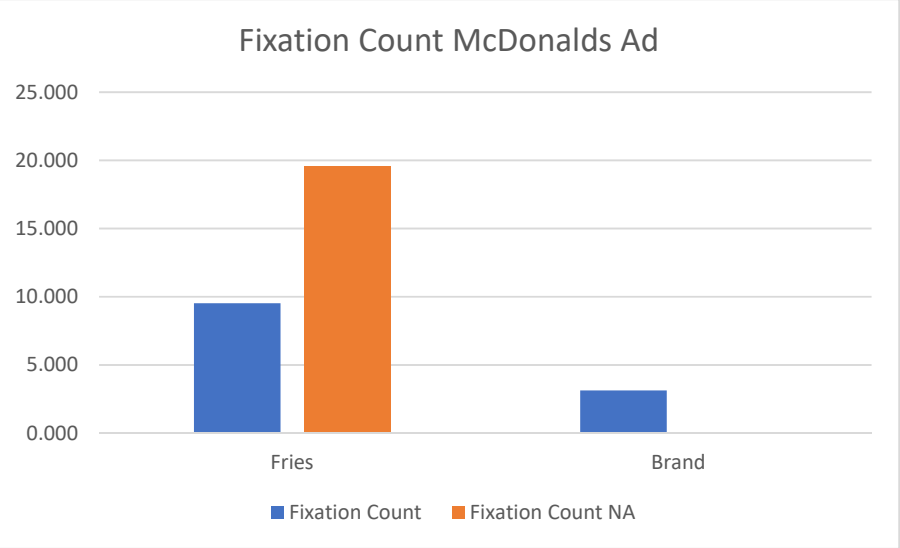


Figure 20 For each specific area of interest, the blue bar is the average fixation count for the condition with anchor and the orange bar is the average fixation count for the condition without an anchor

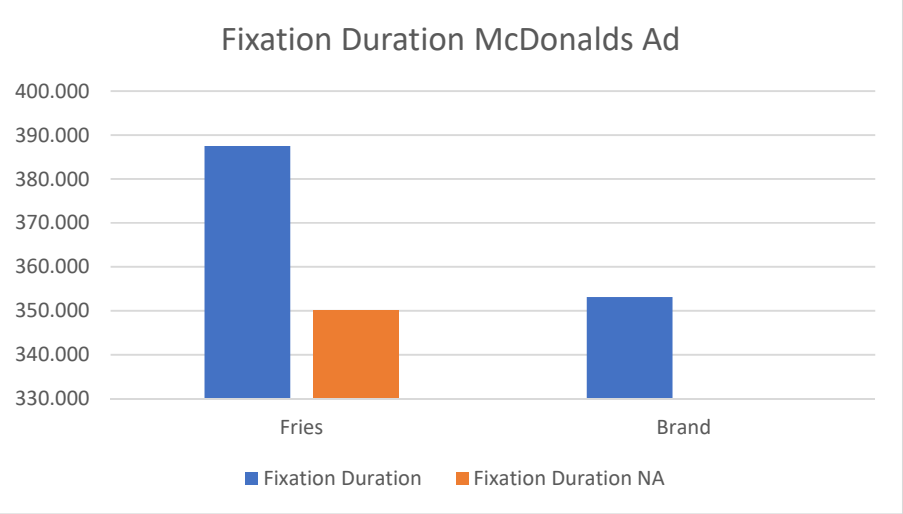


Figure 21 For each specific area of interest, the blue bar is the average fixation count for the condition with anchor and the orange bar is the average fixation duration for the condition without an anchor

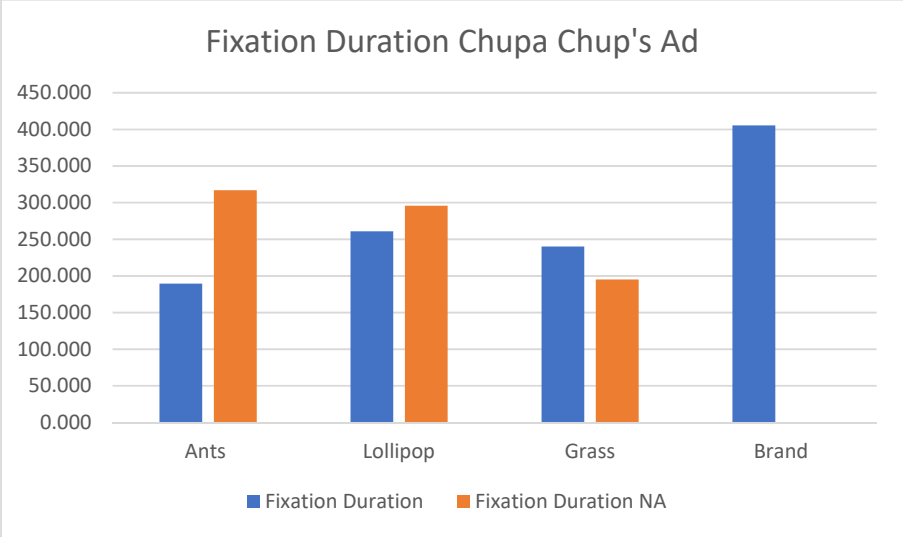


Figure 22 For each specific area of interest, the blue bar is the average fixation duration for the condition with anchor and the orange bar is the average fixation duration for the condition without an anchor

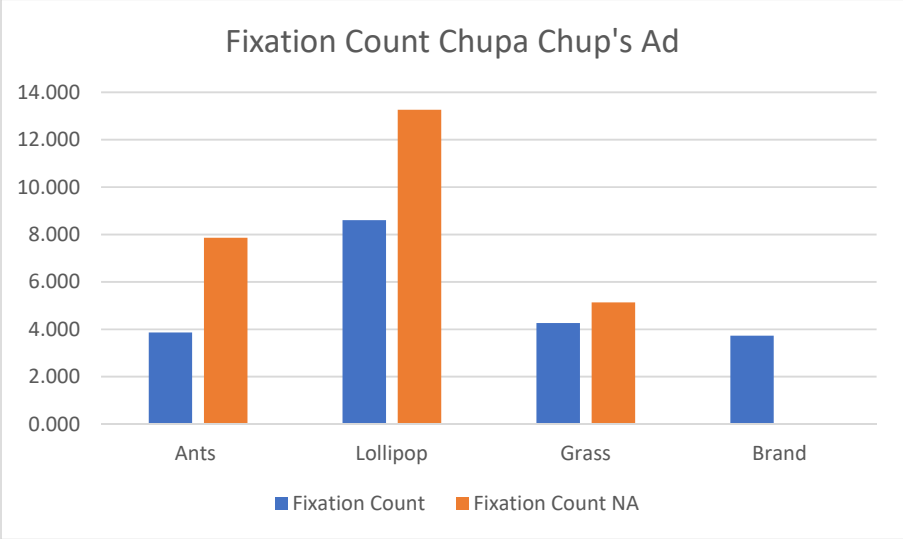


Figure 23 For each specific area of interest, the blue bar is the average fixation count for the condition with anchor and the orange bar is the average fixation count for the condition without an anchor

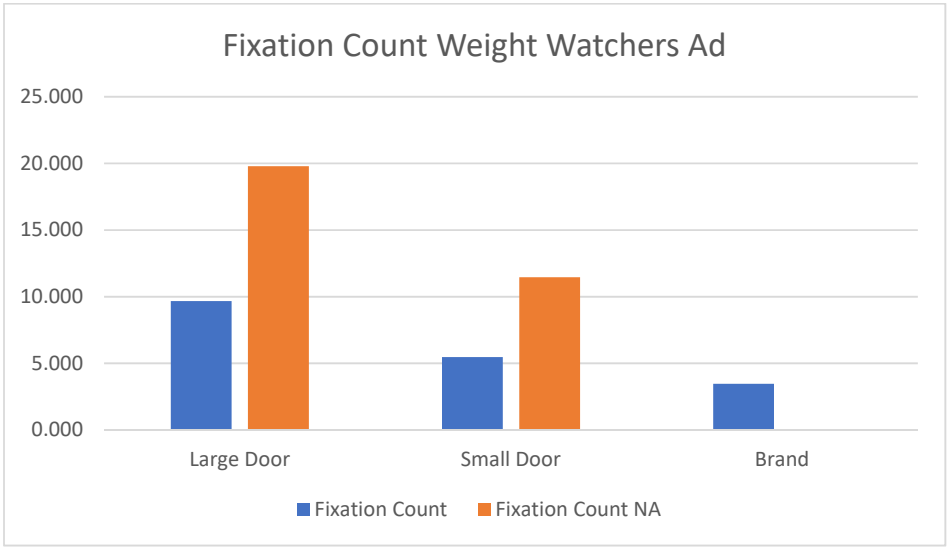


Figure 24 For each specific area of interest, the blue bar is the average fixation count for the condition with anchor and the orange bar is the average fixation count for the condition without an anchor

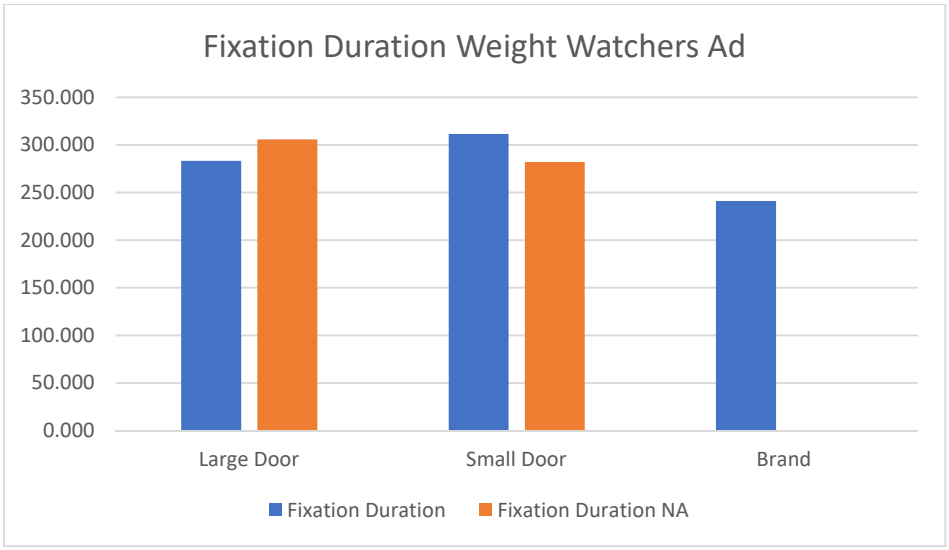


Figure 25 For each specific area of interest, the blue bar is the average fixation duration for the condition with anchor and the orange bar is the average fixation duration for the condition without an anchor

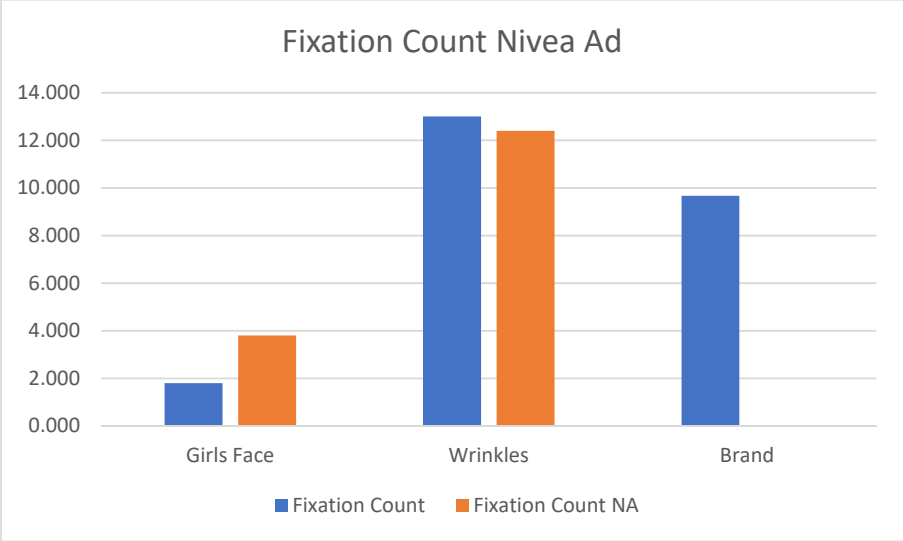


Figure 26 For each specific area of interest, the blue bar is the average fixation count for the condition with anchor and the orange bar is the average fixation count for the condition without an anchor

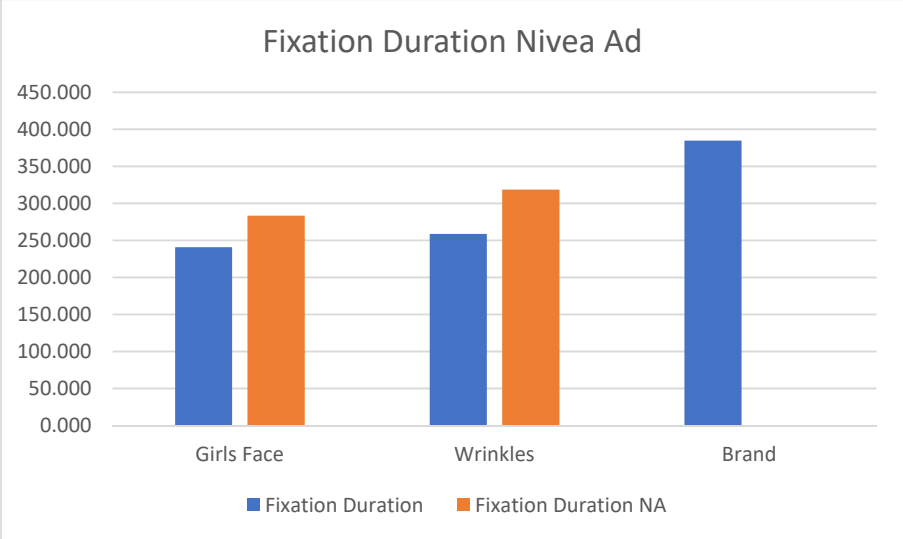


Figure 27 For each specific area of interest, the blue bar is the average fixation duration for the condition with anchor and the orange bar is the average fixation duration for the condition without an anchor

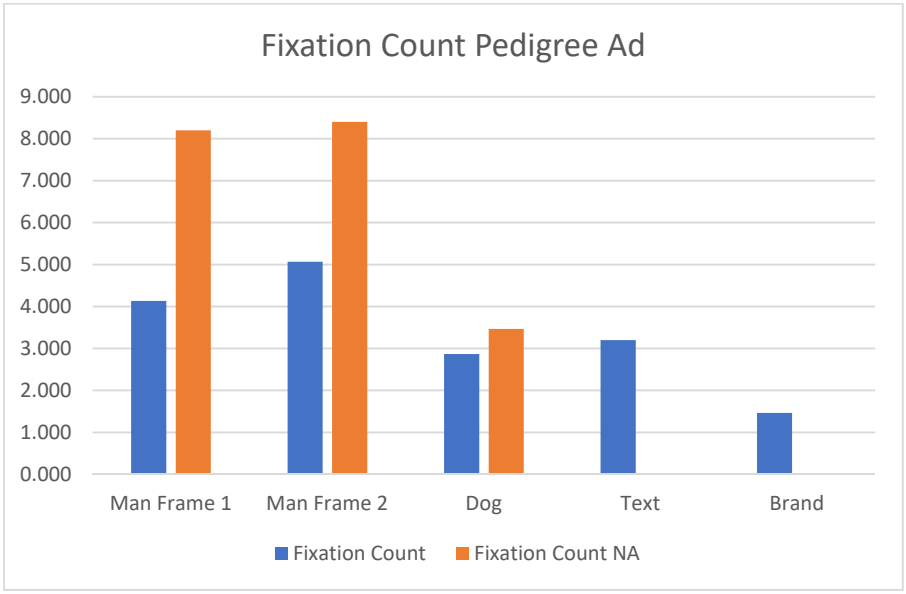


Figure 28 For each specific area of interest, the blue bar is the average fixation count for the condition with anchor and the orange bar is the average fixation count for the condition without an anchor

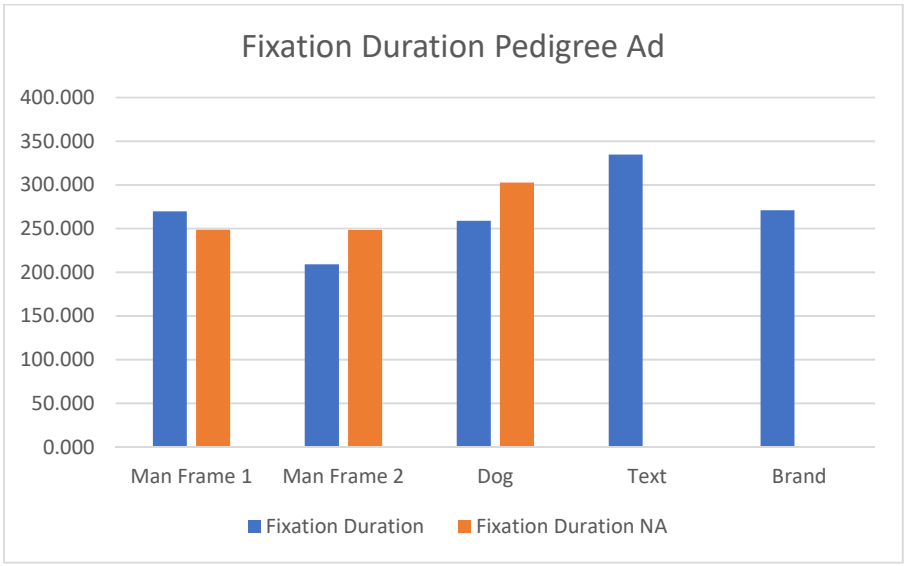


Figure 29 For each specific area of interest, the blue bar is the average fixation duration for the condition with anchor and the orange bar is the average fixation duration for the condition without an anchor

Appendix C

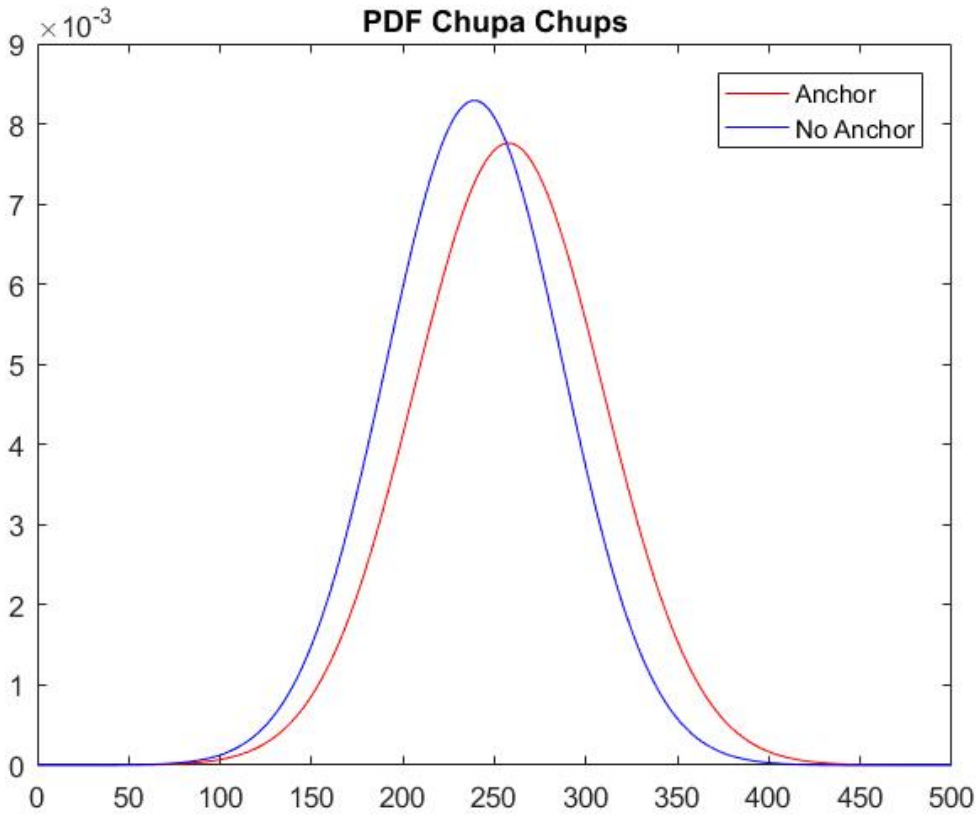


Figure 30 Plotted probability distribution function of the normal distribution of the mean fixation duration of the Chupa Chups ad with and without anchor

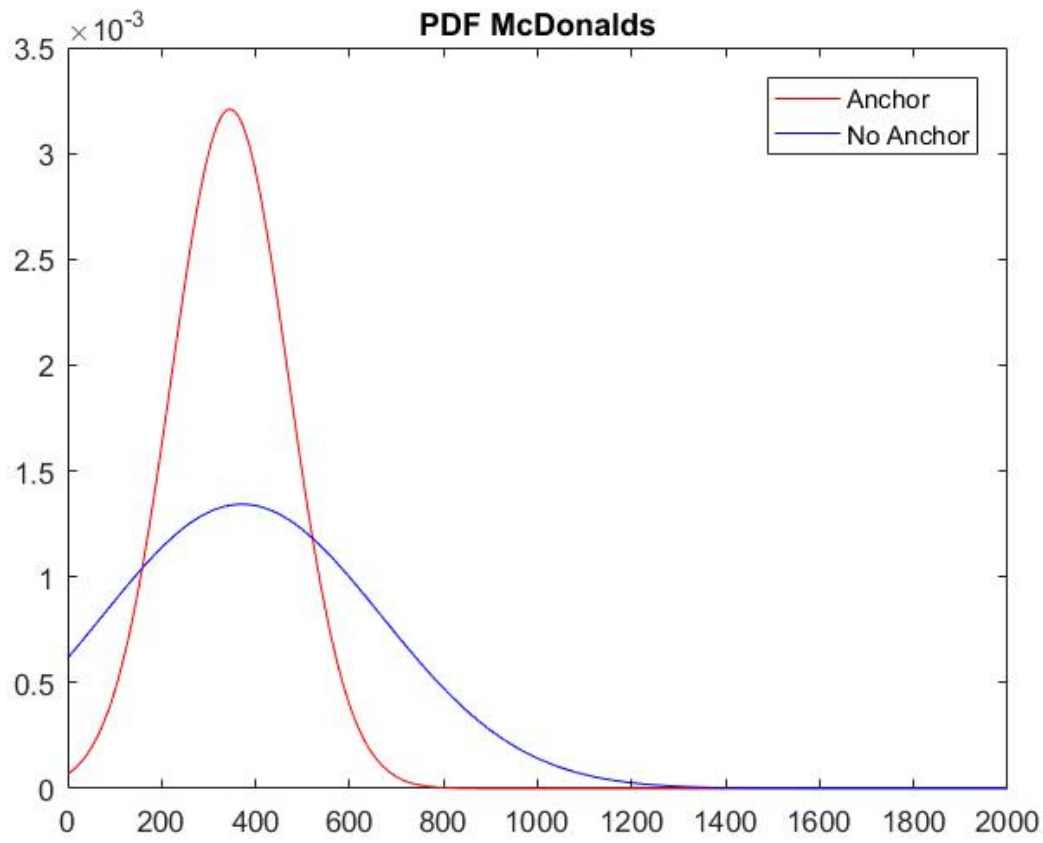


Figure 31 Plotted probability distribution function of the normal distribution of the mean fixation duration of the McDonalds ad with and without anchor

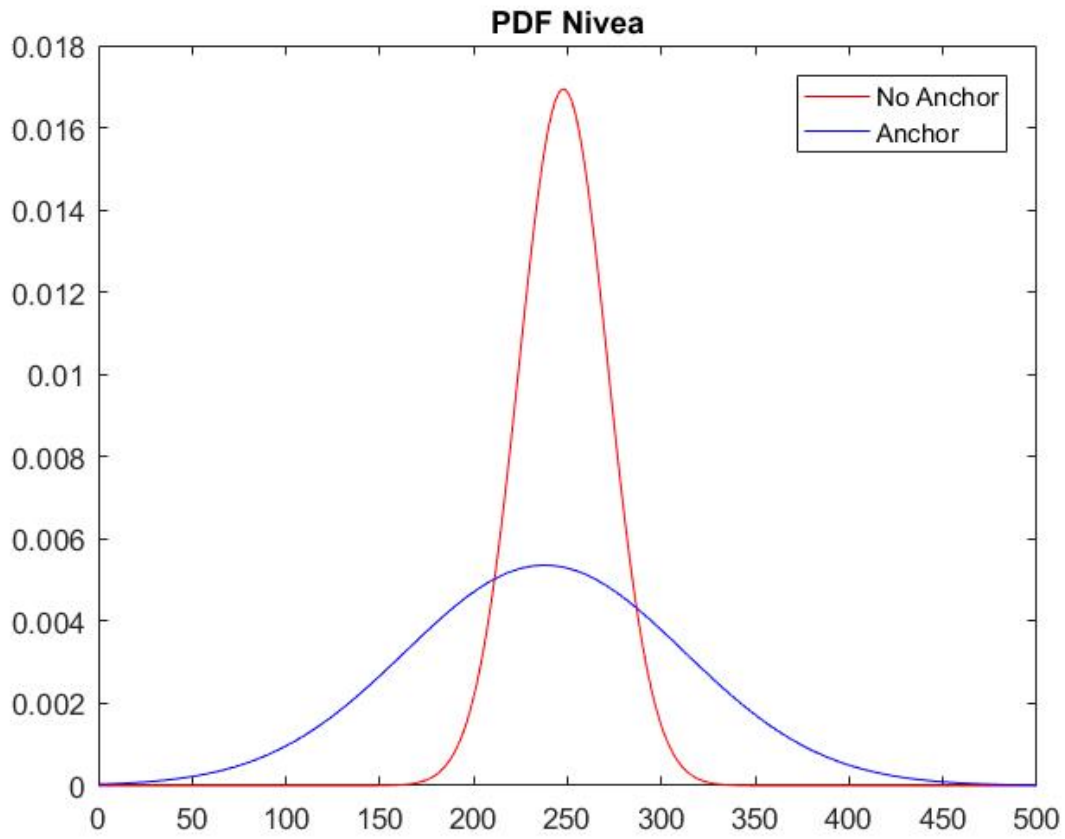


Figure 32 Plotted probability distribution function of the normal distribution of the mean fixation duration of the Nivea ad with and without anchor

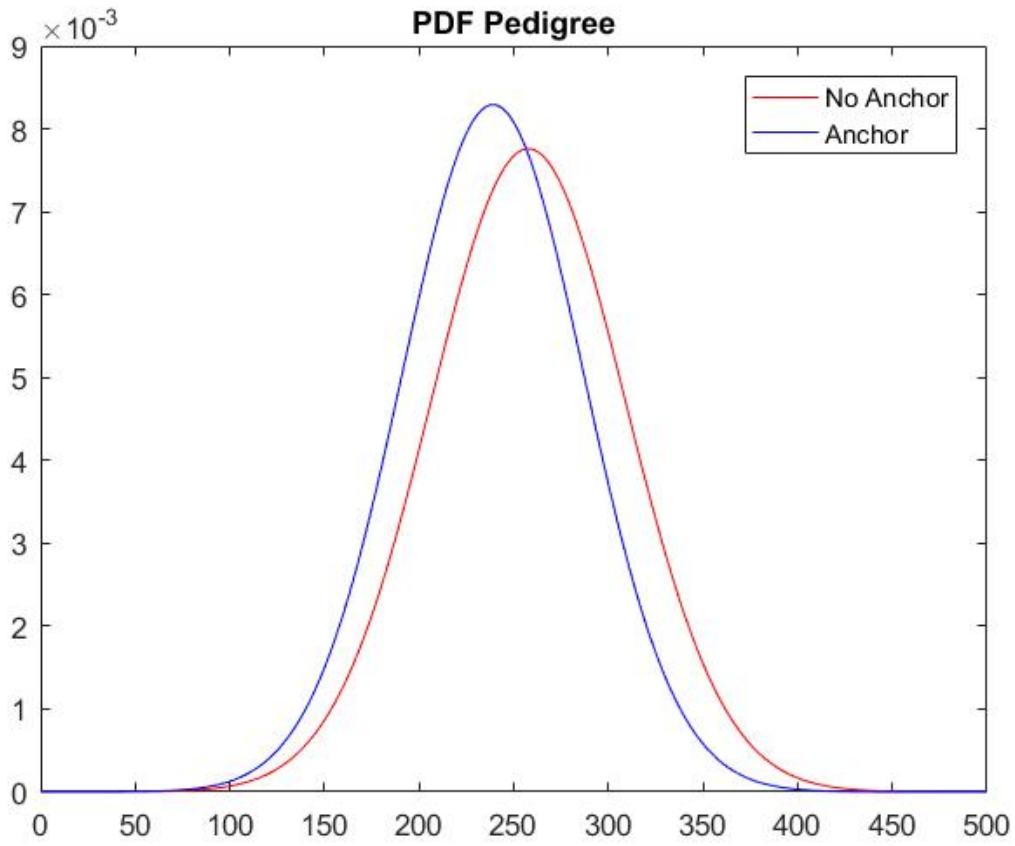


Figure 33 Plotted probability distribution function of the normal distribution of the mean fixation duration of the Pedigree ad with and without anchor

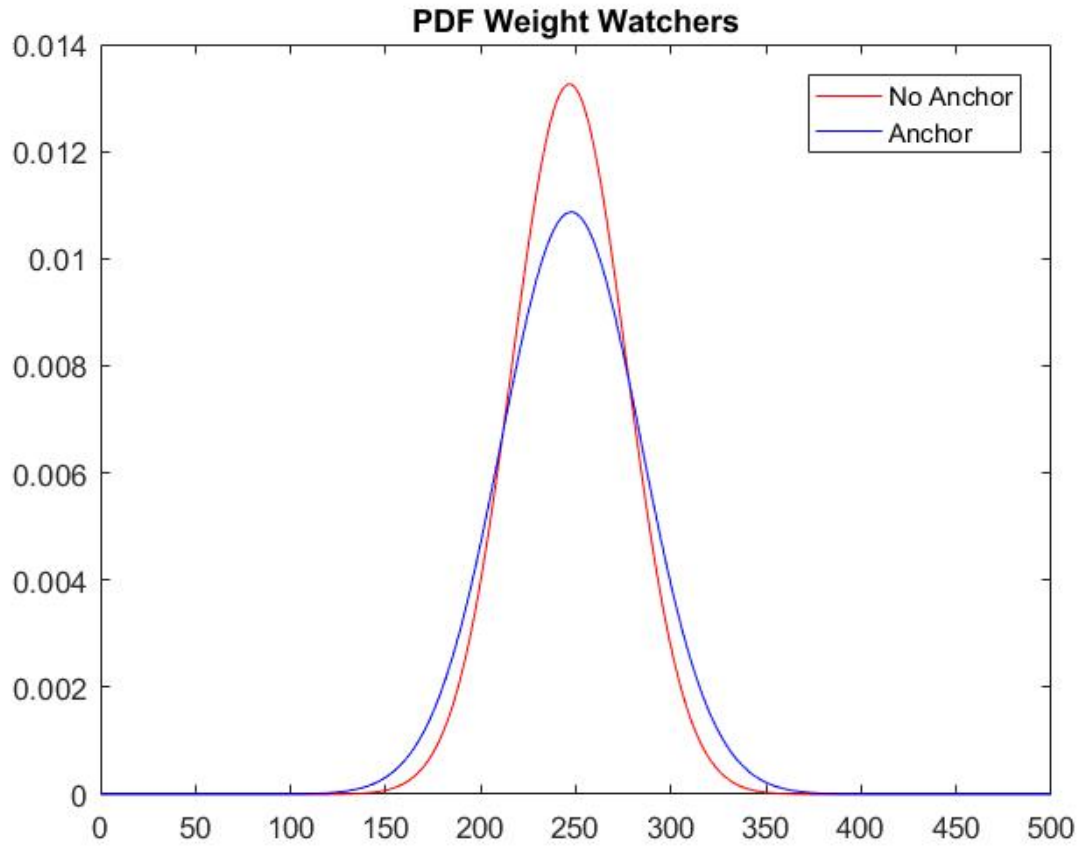


Figure 34 Plotted probability distribution function of the normal distribution of the mean fixation duration of the Weight Watchers ad with and without anchor

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