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Infographics as a public communication tool in the covid-19 pandemic

Bachelor thesis module 12

Kleijsen, H.A. (Hielke, Student B-MST)
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Enschede, The Netherlands
Management, Society and Technology
Supervisor: DR. P.J. Klok
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Abstract

In this bachelor thesis, the adherence to gestalt laws of visual perception of infographics of the Dutch government in the covid-19 pandemic is studied. The research goal was to analyze the quality of the infographics as a tool to inform the citizenry of the current government measures surrounding covid-19 policy. This is analyzed using empirical research data and infographics published by the Dutch government (n =33). The results show that some gestalt laws of visual perception are adhered to better than others, however it does show that there is a fairly high degree of usage of gestalt laws of visual perception, and thus the positive effects that are related to the usage of these laws, are expected to be present in these infographics. The conclusions of this thesis are that the infographics did uphold a certain level of adherence to the gestalt laws, which subsequently resulted in a more clear and unified infographic. This thesis provide a research agenda, which can be used to improve and expand the analysis on these government infographics, which can result in more interesting and in-depth findings.

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1 Introduction to the research problem and background

At the start of March, 2020, the covid-19 pandemic spread across the Netherlands. Suddenly, citizens needed to reside in lockdown, and had to adhere to certain government measures that greatly impacted society as a whole. In these times of crisis, it is vital that clear communication strategies are practiced by the government to inform their citizens. This has to be done to minimize confusion among its's citizenry, create transparency of their motivations (of their measures), and to spread their message through as many channels as possible, to reach as many citizens as possible. Communication about the recent government policy, such as communication about the safety of the vaccines is in the realm of public communication that is important to the public health in the pandemic. To do this, the Dutch government can use various public communications resources to reach its' citizenry, which offers a wide range of possibilities. Recently, the government, next to traditional media such as the newspapers, journals, and television programs, expanded their public communication efforts into a more digital sphere, with data visualizations and infographics. These are particularly interesting, since these carry a big potential impact that these can have on the citizenry as a public communications tool.

"Infographics" as studied in this thesis, is defined as "a chart, diagram, or illustration (as in a book or magazine, or on a website) that uses graphic elements to present information in a visually striking way" (Merriam webster, nd). Infographics can be a very powerful tool to convey a message to the citizenry, because of the power these have to combine visualizations and information. As a result of the combination of these, the message is easier to understand for the public, next to that, general understanding of the issue that is conveyed using this type of visualization increases (Egan et al., 2021). It is a probable assumption to make, that this is one of the reasons the government uses infographics to inform their citizens in the covid-19 pandemic. It is a method to communicate the sometimes convoluted government safety measures and implications of the covid-19 pandemic, and makes it easier to understand for the citizenry using these types of visualizations. However, in the case of public communication, it is of high importance to use effective infographics, because of the fact that "visually powerful methodological infographic[s] improve knowledge and trust." (Kiernan et al., 2018, p. 782).

To evaluate whether or not infographics are effectively designed, and thus resulted in a positive impact on public knowledge and trust in the government, there is a need for a theoretical framework to be able to assess the infographics and its' visualizations. In psychology, in the last century, progress has been made in the realm of assessing visual perception of humans, and how we arrange the visual stimuli we perceive in the world around us, and how we make sense of the world. One of the main theories in visual perception that is discussed, is the gestalt theory of visual perception. *""Gestalt" is German for "unified whole". The first gestalt Principles were devised in the 1920s by German psychologists Max Wertheimer, Kurt Koffka and Wolfgang Köhler—who aimed to understand how humans typically gain meaningful perceptions from the chaotic stimuli around them. They identified a set of laws which address the natural compulsion to find order in disorder. According to this, the mind "informs" what the eye sees by perceiving a series of individual elements as a whole."(Interaction design foundation, nd).* Gestalt theory defines these laws of visual perception based on which primary stimuli it reaches in a subject. These laws have been subject to many experiments since the inception of this theory, and have shown to have effects on visual working memory, perceptual organization, detection of important

visual percepts and other positive qualities that can be present in infographics. (Peterson & Berryhill (2013), Prinzmetal & Banks (1977), Kovacz & Julesz (1993)).

The gestalt theory of visual perception is a set of rules which could then subsequently be used to analyze the government infographics that were published to communicate with its' citizenry. It is useful to analyze to what extent the infographics have adhered to the gestalt laws of visual perception (Mclerny et al., 2014). It is in the best interest to inform the public as best as possible in times of crisis, since there is evidence that supports when effective infographics are published, the adherence to public measures that were communicated are complied more often than when these would not be present (Egan, 2021).

The relevance of this research will be in the realm of public support of public policy, as well as the importance of an informed citizenry for a democracy (Milner, 2002). In times of the pandemic, where it is assumed that when a public is well informed, the measures will be better adhered to (Egan et al., 2021), and in turn leads to less positive covid-19 cases, which is important for public health. Next to this, it is important for the government to keep adjusting and adapting its' communication strategies to best connect with it's ever evolving society. More and more digital media is consumed in this day and age, and the government needs to ensure that it keeps adapting to the best suited way possible to connect with its' citizenry, be it through social media channels or other media that has a more varied reach and is left unexplored. (BNR, 2020). In terms of scientific relevance, this project tries to expand the existing knowledge base that is present on the design of infographics by providing insights specifically in the realm of public communication, and whether these design principles that are used in multiple other applications, are also present in the communication of public policy.

To analyze the government infographics on the presence of gestalt laws of visual perception, a strong theoretical fundament is necessary to ensure that the operationalization, and effects of presence of the laws of visual perception are clearly mapped out and well-funded in established theoretical knowledge. To analyze the empirical research problem, the following research question has been constructed:

To what extent do the infographics published by the Dutch government adhere to the 'gestalt' laws of visual perception?

Sub questions (empirical):

1. To what extent do the infographics published by the Dutch government adhere to the 'gestalt' law of Similarity?
2. To what extent do the infographics published by the Dutch government adhere to the 'gestalt' law of Continuation?
3. To what extent do the infographics published by the Dutch government adhere to the 'gestalt' law of Closure?
4. To what extent do the infographics published by the Dutch government adhere to the 'gestalt' law of Symmetry?
5. To what extent do the infographics published by the Dutch government adhere to the 'gestalt' law of Proximity?
6. To what extent do the infographics published by the Dutch government adhere to the 'gestalt' law of common fate?
7. To what extent do the infographics published by the Dutch government adhere to the 'gestalt' law of past experience?

2: Theoretical framework

2.1 Background theory on infographics in public communication

To answer the research question stated in the introduction, a strong theoretical framework is needed to ensure that the research is relevant in the current paradigm considering data visualizations and other forms of public communication. To start off, it is necessary to firstly discuss the relevancy of effective infographic usage by the government. Hereafter, it is necessary discuss the effects and contents of the gestalt laws of visual perception, and what implications this has on the infographics, that will be analyzed in the latter part of this thesis.

Potential of infographic usage in public/science communication setting

According to Mclerny et al. (2014), "When [infographics are] combined with increased cultural awareness of data, visualization, and informatics (and given the web infrastructure), there are huge opportunities to improve the use of visualizations within and beyond science. From governments and research organizations to the media, communication strategies for complex and uncertain scientific research are being reconsidered." (Mclerny et al., 2014, p. 155). This means that the potential impact that is considered by Mclerny et al. is expected to be significant, for all ways of communication, be it in governmental contexts, or science communication. It is important in the context of this research, since the infographics that are published can have a great impact on adherence to the covid measures, if these infographics tell the public what needs to be heard according to the Dutch government.

Reach of public infographics

Due to the nature of infographics and the way these are presented, they can be used in a wide variety of settings.(Joshi & Gupta, 2021). As a still image, infographics are easily shared through multiple mass media channels, which can thus be kept consistent, the content that is displayed does not warrant changes to make it compatible to the respectable used media channel. The reach of the infographics is expected to be vast, according to Joshi & Gupta (2021), who have observed that correct infographic usage can spread very fast through the digital and social media communication paths. (Joshi & Gupta, 2021). Currently, it is still in not known how many citizens are reached through social media channels, and how many are exclusively making use of traditional media, which could be relevant if the government were to switch to sole digital communication.

Potential impact of widespread infographic usage

The impact that infographics have on public understanding can be of great significance in the Netherlands. Infographics in science communication have already proven to have contributed to a better understanding of the underlying science, and the societal significance of matter that is hard to understand for a lay's audience. This is illustrated in the work and findings of Egan et al. (2021), where it was found that there are higher mask wearing rates among participants that were informed through infographics than the respondents that were not. Infographic usage to educate citizenry in a public setting can achieve results similar to this, since public understanding of science resulted in an increase in public support for science (Durant et al., 1989)

2.2 Design principles of visual perception
Gestalt theory

Gestalt theory in the context of this theoretical framework is to be considered a set of rules, laws or principles under which our visual perception operates, described by Wertheimer, Koffka and Köhler. These laws are the law of similarity, the law of continuation, law of closure, law of symmetry, law of proximity, law of common fate and law of past experience. Wertheimer (1938) devised these laws as a response to the then dominant principles of visual perception. The gestalt theory challenged the idea that perception is just the sum of its parts, of what individuals see and that these can be broken down in parts. However, according to the gestaltists ; "Any attempt to explain the figure by analyzing its parts results in the loss of the figure's gestalt. For example, a square has a unity and an identity that cannot be fully appreciated by its description as four straight lines connected by right angles." (Brennan, 2013, p. 209). To make a concept that is related to visual perception more clear, it is better to give an example of this. In Figure 1, you can see the old logo of the Formula 1 racing series. As you can see in

Figure 1: Formula 1 logo 1994-2017

this logo design, initially there is an f present, and a multiple red streaks on the right side of the logo. Even though the image does not move, we are under the impression that this shows a form of speed due to the red traces that follow the 'F'. Next to the perception of motion, another gestalt principle is used. Due to the law of closure, we perceive that there is a '1' present that is semi-conjoined to the letter 'f', present in the negative space in the middle of the logo. This shows that 'good gestalt' is more than the sum of its parts and shows how intertwined and good use of these principles can lead to pleasing, and memorable images that will leave a better impression than a logo that does not make use of these principles.

Gestalt theory rests on two main aspects related to visual perception; Figure-Ground organization and "Prägnanz". Figure-ground organization (sometimes called Figure-ground segmentation) in this context is interpreted as the perception of what belongs to the background(Ground) and foreground (the figure) of an image. In most of the images that are used, the balance is fairly clear. An object is placed in front of a background, and we perceive which is which fairly easily. "Figure-ground segmentation is the process by which the visual system organizes a visual scene into figures and their back-grounds. This is one of the most important visual processes because figure-ground distinctions are fundamental to the visual perception of objects and to visuomotor behavior." (Kimchi & Peterson, 2008, p. 660). The second important aspect that is enclosed in gestalt theory as created by Wertheimer Koffka and Köhler (1938) is prägnanz, which means conciseness, or configuration. "Prägnanz is synonymous to "good gestalt". A good gestalt is both simple and unique. "Simple" means that a good gestalt is fully seen at a glance. It is an "eye catcher". "Unique" means that nothing can be added or omitted without causing a qualitative change" (Koenderink, 2018, p. 7-8). According to Koenderink (2018), prägnanz is the way in which a visual percept interlinks into one another, and in a logical and concise way in which the different visual elements make sense with each other in the scope of the full percept.

Prägnanz in itself is a concept which can be described using the laws in the next paragraphs of this theory section. In these paragraphs, each of the laws which contribute to the 'conciseness configuration configuration' of a visual percept (in the case of this research, infographics related to the covid-19 pandemic published by the Dutch government). These laws all relate to a different part of a visual percept, which can then be identified as such, and are tested for numerous effects in numerous circumstances.

2.3 Law of similarity

For the law of similarity, a basic definition is needed to understand what the concept entails in the gestalt theory of visual perception. The law of similarity refers to grouping based on repetition of features, such as color, or other visual percepts (Peterson & Berryhill, 2013). An example of this definition can be found in Figure 2, where In the experiment conducted by Peterson & Berryhill (2013), it was researched what effect the law of similarity has on the visual working memory. Visual working memory is the visual information retained from one fixation to the next. (Sciencedirect, nd) In the series of experiments, test subjects were exposed to several different kinds of visual stimuli in an array of 3, 4 or 6 dots. The subjects were exposed to both a control round without the gestalt principle of similarity present, and one with. "These data established the existence of a constant performance benefit across set sizes (Exp. 1) and showed that similarity requires proximity (Exp. 2)." (Peterson & Berryhill, 2013, p. 1287). In the experiments that were conducted, it was found that there was a performance increase in the visual working memory. This was found in the cases were the gestalt principle of similarity was used, and in a subsequent experiment, there is evidence that suggests that the law of proximity needs to be used in conjunction to see the positive effect that was found in the first experiment.

In Figure 2, a textbook example of the law of similarity is shown. In this image, the grouping based on certain repetition of features is clearly visible, and will be referred back to as reference for the analysis part of this research.

Figure 2:Textbook example of law of similarity. (Stevenson, nd)

An example of the law of similarity in the infographics that were produced by the Dutch government can be seen in Figure 3. Several elements that were shown in this infographic try to distinguish themselves from one another by presenting similar visual percepts. In Figure 3, each of the different phases that are shown use similar visual elements to indicate a relationship to each other, and that these have a similar meaning in the context of the whole infographic. Next to this, the law of similarity is also present in the rectangular information boxes that are placed in a coherent manner along the line of the phases in this image. These text boxes indicate that the information is similar and conjoined in a coherent manner to each other, and following the experiments conducted by Peterson & Berryhill (2013), this configuration should lead to a performance benefit of the visual percepts in this infographic.


Figure 2: Snippet of Infographic "on the way to vaccination" (2020)

2.4 Law of continuation

The Law of continuation or law of continuity in gestalt theory entails that the mind follows each line along the smoothest path available. "The Principle of Continuity indicates lines are seen as following the smoothest path, which suggest that we tend to develop lines of thought by following preconceived meaning making." (Stevenson, nd). These principles have seen use in infographics, and other fields where visual elements are key to transporting clear visual guidance to users, such as in UI design, or web design.

To assess whether this law has effects on the quality of visual percepts, research has been conducted to see what effects good usage of the law of continuation can bring to visual percepts. In Prinzmetal & Banks (1977), several sequential experiments were conducted to study the effect of good application of the law of continuation on the visual perception of the participants. "This research shows that the principle of good continuation can predict forced-choice detection of an element imbedded in a briefly presented visual array." (Prinzmetal & Banks, 1977, p. 389) In the experiments conducted, firstly Prinzmetal & Banks (1977) focused on the continuation of a line where a pattern of similar symbols would be followed and presented two different assemblies of symbols, as seen in Figure 4. In this figure, there is an array of the same symbols in a straight

Figure 4: The assembled array of symbols in the first experiment by Prinzmetal & Banks (1977)

line, as seen in option b, and one which where the line of continuation takes a 90 degree turn, as seen in option a. If the law of continuation were to be followed in this case, a subject would see that the line in 'line a' would take a 90 degree turn up-right, whereas one would perceive that the line of motion goes straight down to the right in option b. In the experiment, it was a reaction based test where Prinzmetal & Banks (1977) asked in a timed response whether the participants had seen an "f" or a "t" after a period of 500 milliseconds of seeing either image a or b (see figure 4). "The conclusion that the effect of good continuation is the result of perceptual organization seems inescapable." (Prinzmetal & Banks, 1977, p. 394).

To refer back to an earlier image used, in figure 3, a snippet of one of the infographics published by the Dutch government, the principle of continuation is used by using the a line that pulls the viewers from phase to phase in the infographic, and that the visual percept will be followed along the smoothest path in the visual percept.

A textbook illustration of the law of continuation can be seen in Figure 5. In this figure, the law of continuation can be clearly seen, and be used for reference in the analysis part of this thesis to refer back to.
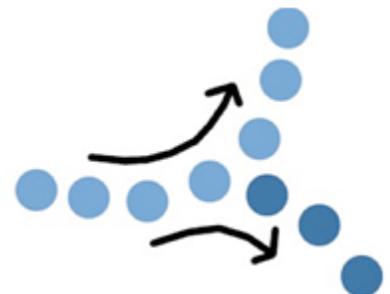

Figure 5: Textbook illustration of the law of continuation. (Stevenson, nd)

2.5 Law of closure

The law of closure in gestalt theory of visual perception refers to the fact "that we perceptually close up, or complete, objects that are not, in fact, complete." (Soegaard, 2012). Hamlyn also describes closure as "Incomplete figures tend to be perceived as complete, and this organizational characteristic is called closure; for example, a curved line with ends not quite touching will still be perceived as a circle because of the compelling tendency for closure" (Hamlyn, 2017, p. 215). An example of this can be seen in Figure 5. In this Figure, there are two visual percepts present, the one in figure A is perceived as a circle, whereas (if it were addressed as an individual percept rather than a whole) it is just a curved line. Due to the law of closure, we still see that there is a circle present in the illustration(b) because the gaps are filled in by our own minds. (Koffka, 1935).

Figure 6: A textbook example of closure from Hamlyn (2017)

What this means in reality for visual percepts, is that even when objects are not fully drawn out, it is still seen as a salient figure in a figure-ground organization style in a visual percept. There are many use cases for this law to make use of in design, however it is rather unclear what effects it has on the recipients of visual percepts in use cases. In experiments conducted by Kovacz & Julesz (1993), it was shown that due to the law of closure, certain elements of importance can be outlined using closure techniques in visual percepts. In the experiment that was conducted, subjects were required to find the closed line in an array of seemingly random visual stimuli, as seen in Figure 6. In this Figure, only one of these shown contains a closed line circle, and in a subsequent experiment conducted in the same study "it was much easier to detect the target patch when it was within the circle than when it was outside of it." (Kovacz & Julesz, 1993, p. 7497).
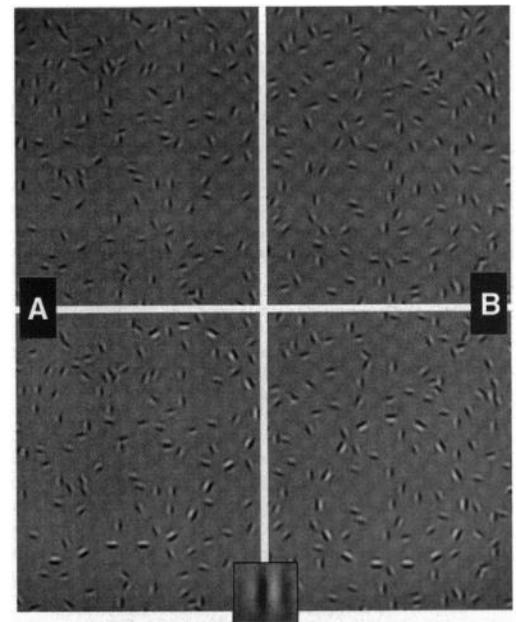

Figure 7: the visual arrays as used by Kovacz & Julesz (1993)

A textbook example illustration for the law of closure can be seen in Figure 7. This example will be used to further code and analyze the infographics that are contained in the dataset of this research.

2.6 Law of proximity

The law of proximity is another one of the set of laws/principles that is included in the gestalt theory of visual perception. "The law of proximity posits that when we perceive a collection of objects, we will see objects close to each other as forming a group."(Soegaard, 2012).

In the experiments conducted by Xu (2006), the effects of the law of proximity are tested on the performance metric of visual short term memory. In the experiments, Xu found that "these results indicate that location/proximity and connectedness are essential elements in defining a coherent visual object representation in VSTM (Visual short term memory)" (Xu, 2006, p. 815). In the first set of experiments, visual percepts were arranged in an array, in which the subject had to recall the image that was shown to them from short term visual memory. These results of this set of experiments indicated that "as the connection strength weakened between two part features, the magnitude of the object benefit, or object-based feature integration, in VSTM and the total amount of feature information that could be retained in VSTM decreased accordingly" (Xu, 2006, p. 820).

In contestant with the results that were found in the study by Xu, earlier experiments indicated other effects of the law of proximity. In an study conducted by Oyama (1961) , it found that the law of proximity can contribute to the perceptual grouping effect, and that there was a way to quantify the law of proximity as stated by Wertheimer, Koffka and Köhler in gestalt theory. The results of the experiment showed that "The results showed that the ratio varied as a power function of spatial separation and also that the vertical grouping was slightly dominant" (Oyama, 1961, p. 306).

What this means in the context of infographics, is that the law of proximity can be used to stimulate the short term memory of the readers of the infographics. This can be accomplished by placing certain visual elements near each other, to engage this short term memory storage. Next to this, it can be used to indicate interconnectedness with other visual elements that are of higher importance in an infographic, and through the law of proximity, and perhaps usage of other laws from gestalt theory, to create an infographic that will have a greater effect on the readers than ones that are not aligned with the gestalt theory of visual perception.

A textbook example illustration would be something you see in Figure 8. In this figure, you can see that the visual percepts that are required to be seen connected by the maker of the illustration , are placed near each other, and will be perceived as such.
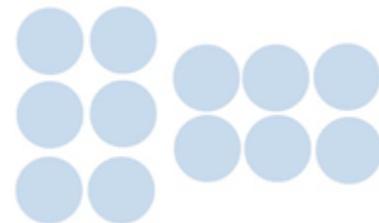

Figure 8: Textbook example of Law of proximity. (Stevenson, nd)

2.7 Law of symmetry

The law of symmetry in gestalt theory of visual perception refers to the principle that "elements will be grouped perceptually if they are similar to each other." (Soegaard, 2012). In Wagemans (2012), the law of symmetry is stated as "a factor of "good shape" (Koffka, 1935), although it seems to be easily overruled by good continuation and convexity (Kanizsa, 1979)." (Wagemans, 2012, p. 1190).

"A good figure is complete, tending toward symmetry, balance, and proportion." (Brennan, 2013 p. 215). In Brennan, it is seen as a necessity with the law of symmetry to take into account that the laws of similarity and the figure-ground organization have to be present in the right balance, to achieve a good figure.

Literature points in the direction however that symmetry is not as important of a factor as the other gestalt laws of Visual perception. Kałamała "observed no effects of symmetry of visual patterns on VWM (visual working memory) performance"(Kałamała et al., p. 5, 2017) and seems to point towards the notion that has no benefit to the visual working memory of the subjects. However, in the context of this thesis, not only memory plays a part in the quality of an infographic. In other research, it was found that in a series of experiments results "show that the number compositional elements influences aesthetic appeal ratings. For the abstract imagery, symmetry also plays a role such that participants find the more symmetric images appealing." Bauerly & Liu, 2008, p. 275). This means in the context of infographics, it does not necessarily indicate that the message conveyed through these more symmetrical infographics will remain longer in memory, but rather the aesthetic pleasingness of the infographic would improve. However, there is evidence missing that would indicate that attractiveness has a positive effect on the visual perception of infographics.

A textbook example illustration for the law of symmetry is provided in Figure 9; in this Figure, it is clearly visible that the symmetrical elements belong to each other in ways that designers can utilize this law, and how it can be found back in the infographics of the Dutch government in the dataset of the analysis.

[   ][   ][   ]

Figure 9: A textbook example of law of symmetry (Soegaard, 2012)

2.8 Law of common fate

In gestalt theory, the law of common fate is also an enclosed concept. The law of common fate states that "elements tend to be perceived as grouped together if they move together." (Todorovic, 2008). The law of common fate in literature is also described by Wagemans (2012, p. 1181), "One of the most powerful of the classic grouping principles is common fate—the tendency for elements that move together to be perceived as a unitary entity (Wertheimer, 1923).".

The effects of common fate in perceptual grouping has been studied in multiple different experiments by Uttal et al. (2000). In the experiments conducted by Uttal et al "Results illustrate the importance of common fate in motion perception [on visual percepts]".(Uttal et al., 2000, p. 301). The visual percepts used in the experiments by Uttal et al., were dotted lines, where the more coherently spaced and straight dotted lines had a significant advantage over the crossed, incoherently spaced dotted lines in the tests performed on the subjects. It showed that when the dots that belong together are presented in a clear and coherent form, the salience and perception of motion improve in the visual percepts.(Uttal et al., 2000).

What the effects of these results mean for the application and recognition in infographics is not necessarily very clear. However, certain visual percepts can be grouped together using different laws of visual perception, be it through the law of proximity, or the law of similarity, and in combination with the findings that are captured in the law of common fate, can indicate a motion design which can guide readers in a certain direction.

In terms of relevancy for the analysis of the infographics included in the dataset, it is required that to capture the law of common fate in the infographic, that at least one of the two laws of perceptual grouping is present, be it the law of similarity, or the law of proximity.

A textbook example of the law of common fate can be seen in Figure 10. In Figure 10, The airplanes that are pointing in the same direction achieve a higher synergy and perceived level of salience to the human perception of this image because of the law of common fate, rather than the other grouping principles that are present in the reference image in Figure 10. It can be a powerful tool that can override the other grouping principles in visual perception.
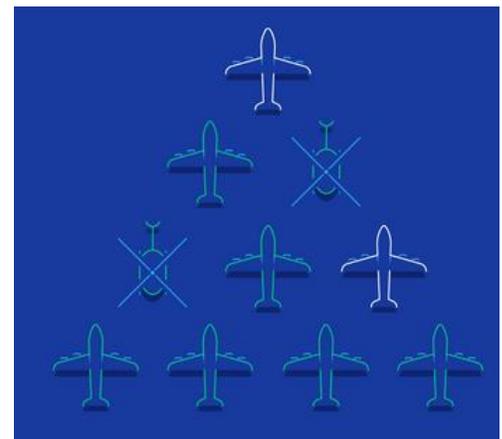

Figure 10: Textbook example of law of common fate. (Philips, 2018)

2.9 Law of past experience

The last gestalt law of visual perception that will be elaborated upon in this theoretical framework is the law of past experience. According to Todorovic (2008) "elements tend to be grouped together if they were together often in the past experience of the observer."(Todorovic, 2008) The concept that is introduced by Todorovic relies on past experience which gives meaning to the visual percepts, rather than the specific configuration that the percepts are configured in.

Since the law of past experience is contemporary work that is introduced by Todorovic, research into the workings and effects of this stated law is not found much in research. Next to this, Todorovic acknowledges that the law of past experience has limited reach and is hierarchically worse than the rest of the visual based grouping principles introduced by the gestalt movement. "Although acknowledged by the gestaltists, the experience-based principle was deemed of secondary importance, compared with the other, stimulus-based principles, and easily dominated by them."(Todorovic, 2008).

A textbook example of the law of past experience can be seen in figure x. In figure x, when just taking into account what shapes are present in the image, one would only see a green figure on the right side of the image, and a 'ground' on the left side of the image. However, according to Todorovic, because of the law of past experience, a visual percept is communicated that it is indeed a needle-leafed tree, when based upon the law of past experience.

Nevertheless, for the sake of the analysis that is conducted in this thesis, it will still be analyzed, namely whether this principle is present in the infographics of the dataset, however these might not be taken into consideration in the conclusions of this research, because of the limited theoretical basis, which is only found Todorovic's (2008) work.
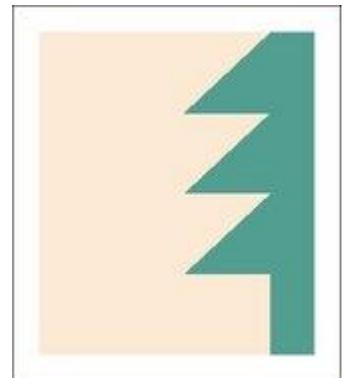
Figure 11: Reference image law of past experience

2.10 Short Summary theoretical framework

To summarize, the gestalt laws of visual perception all show positive effects on various different fields of visual perception, such as visual memory, short term memory, aesthetic pleasingness, and other positive effects that are beneficial to the perception of infographics. It is expected that these positive effects of the theory described in this chapter will be present in the analyzed dataset, to varying degrees. These laws of gestalt are a good measure of these infographics, since if these are utilized correctly, and analyzed to be present in the infographics, the positive effects of the presence of these laws of visual perception will be applicable to the infographics.

3 Methodology

3.1 Research design

To research the extent to which the government infographics applied the laws present in the theoretical framework, a qualitative research design was used to score the individual cases on all of the laws of gestalt in a scoring based system using a dichotomous variable for each of the empirical values stated in the sub questions of this research. The program SPSS is used to create a dataset of the selected infographics, and is used to score each of the observable independent variables contained in the sub questions. Hereafter, infographics will be analyzed with the built-in tools in the SPSS program, to analyze the whole dataset (n = 33) to see in how many of the total cases, a certain law has been met.

3.2 Operationalization of sub question variables

The operationalization of the variables in the sub questions is done by using a dichotomous scoring metric in the SPSS program, to analyze individual infographics published by the Dutch government. Dichotomous variable scoring has been chosen as the operationalization metric to be able to simplify the analysis of the infographics, which allows for a greater dataset in the limited timespan of this thesis. The theoretical framework, and its' textbook examples will be the main points of reference to see whether or not a certain gestalt law has been adequately met and implemented in the individual infographic. However, not every sub question variable can be treated the same, if the findings in the theoretical framework were to be followed. In the next paragraphs, the sub question variable requirements will be operationalized. Whether or not, these sub question variables have special conditions that are to be met to ensure that the data that is shown from these variables is compliant with the findings from the theoretical framework. Next to this, each of the textbook examples is shown in the next paragraphs as a reference image to see if a visual percept meets any of the requirements stated in this operationalization paragraph.

Law of similarity

The law of similarity is a Dichotomous variable of scale, with a range of 0 to 1, with the variable label of "lawsimilarity".

The law of similarity will be scored with a 1, if it satisfies the following conditions:

Figure 12: Textbook example of law of similarity. (Stevenson, nd)

- The visual percept contains a gestalt configuration that is similar to the textbook example as seen in Figure 12.
- If the visual percept satisfies the definition of 'grouping based on repetition of features, such as color, or other visual percepts' (Peterson & Berryhill, 2013).
- The visual percept needs to also contain the law of proximity, as per Peterson & Berryhill (2013), "showed that similarity requires proximity (Exp. 2)." (Peterson & Berryhill, 2013, p. 1287).

Law of continuation

The law of continuation is a Dichotomous variable of scale, with a range of 0 to 1, with the variable label of "lawcontinuation" in the SPSS program.

The law of continuation will be scored with a 1 if it satisfies the following conditions:

- The visual percept contains a gestalt configuration that is similar to the textbook example of the law of continuation, as shown in Figure 13.
- The visual percept satisfies the definition "lines are seen as following the smoothest path, which suggest that we tend to develop lines of thought by following preconceived meaning making." (Stevenson, nd).
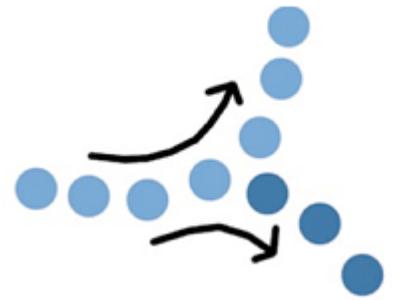
Figure 13: Textbook example of the law of continuation. (Stevenson, nd)

Law of closure

The law of past experience is a Dichotomous variable of scale, with a range of 0 to 1, with the variable label of "lawclosure".

The law of closure will be scored with a 1 if it satisfies the following conditions:

- The visual percept contains a gestalt configuration that is similar to the textbook example of the law of closure, as shown in Figure 14.
- The visual percept satisfies the definition " "that we perceptually close up, or complete, objects that are not, in fact, complete." (Soegaard, 2012).

Figure 14: Textbook example of closure from Hamlyn (2017)

Law of proximity

The law of past experience is a Dichotomous variable of scale, with a range of 0 to 1, with the variable label of "lawproximity".

The law of proximity will be scored with a 1 if it satisfies the following conditions:

- The visual percept contains a gestalt configuration that is similar to the textbook example of the law of proximity, as seen in Figure 15.
- The visual percept satisfies the definition " we perceive a collection of objects, we will see objects close to each other as forming a group."(Soegaard, 2012).
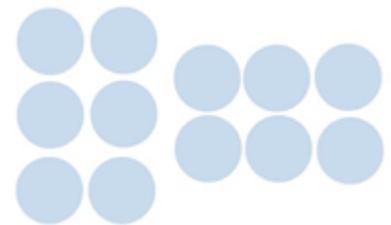
Figure 15: Textbook example of Law of proximity. (Stevenson, nd)

Law of symmetry

The law of symmetry is a Dichotomous variable of scale, with a range of 0 to 1, with the variable label of "lawsymmetry".

The law of symmetry will be scored with a 1 if it satisfies the following conditions:

Figure 16: A textbook example of law of symmetry (Soegaard, 2012)

- The visual percept contains a gestalt configuration that is similar to the textbook example of the law of symmetry, as shown in Figure 16.
- The visual percept satisfies the definition "elements will be grouped perceptually if they are similar to each other." (Soegaard, 2012).

Law of common fate

The law of past experience is a Dichotomous variable of scale, with a range of 0 to 1, with the variable label of "lawpastexperience".

The law of common fate will be scored with a 1 if it satisfies the following conditions:

- The visual percept contains a gestalt configuration that is similar to the textbook example of the law of common fate, as shown in Figure 17.
- The visual percept satisfies the definition "elements tend to be perceived as grouped together if they move together." (Todorovic, 2008).
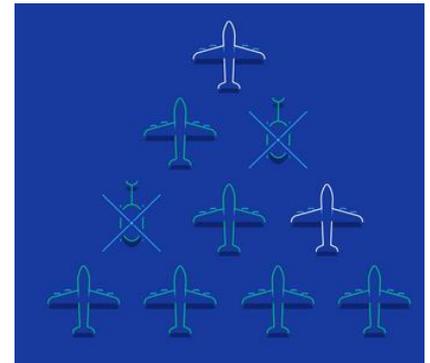
Figure 17: Textbook example of law of common fate. (Philips, 2018)

Law of past experience

The law of past experience is a Dichotomous variable of scale, with a range of 0 to 1, with the variable label of "lawpastexperience".

The law of past experience will be scored with a 1 if it satisfies the following conditions:

- The visual percept satisfies the definition "elements tend to be grouped together if they were together often in the past experience of the observer."(Todorovic, 2008).
- The visual percept satisfies the gestalt configuration that is similar to the past experience example as shown in Figure 18.
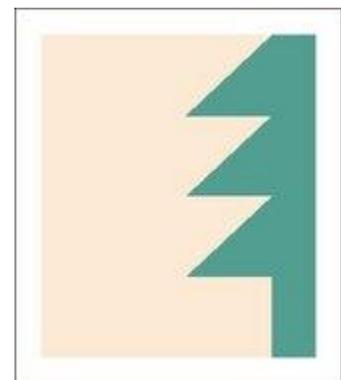

Figure 18: Reference image law of past experience. (Todorovic, 2008)

3.3 Operationalization of the Research question variable

The research question variable "gestalt laws of visual perception" will be operationalized using a combined score from all the different sub question variables that are scored in the SPSS dataset. The gestalt laws of visual perception, as first incepted by Köhler, Wertheimer and Koffka (1938), are used in the analysis of this thesis, as well as the contemporary work provided by Todorovic (2008). Next to this, it will also take the conditions outlined in the previous chapter into account in the construction of this variable. The values for each individual empirical sub question value will be added up, and divided by the amount of available variables per data entry. This will result in a mean score between 0 and 1, and will show to what extent the gestalt laws of visual perception are adhered to in the data that was selected for this research. The variable mentioned in the research question, "the gestalt laws of visual perception" will be operationalized using the empirical data that is a result of the analysis conducted with the sub question variables.

In the SPSS program, the research question variable is labelled "Gestaltvisualperception", and can have a value in the range of 0 to 1, where 1 is a fully adhered to the laws of visual perception , and 0 is no adherence to the laws of visual perception.

The function of "compute variable" is used to calculate main research variable by using the following function:

```
DATASET ACTIVATE DataSet1.

COMPUTE  Gestaltvisualperception=(LawSimilarity  +  LawContinuation  +
LawClosure   +   LawSymmetry   +   LawProximity   +   LawCommonFate   +
LawpastExperience) / 7.

EXECUTE.
```

3.4 Data collection

The data used in this research, are all the infographics that were posted in the timeslot of 10th of march 2020 until 25th of May, 2021. On the website of the Dutch government, rijksoverheid.nl. On this website, a database of communication resources is present, in which all the infographics in this time period are uploaded. (Rijksoverheid, 2021). All covid-19 infographics (N = 33) that were used as public communication of the guidelines, guides and information on policy surrounding the covid-19 pandemic response of the Dutch government were uploaded. Using the collection that is found here, a dataset was compiled from the list that is present on the webpage, and a timeslot is chosen from the start of publications (10th of March, 2020) until the 28th of May, 2021. This timeslot was chosen to properly analyze as much of the published infographics as possible, in the time that the research can be feasibly conducted. However, since the database updates certain publications with the most recent covid-19 measures, it means that some of the infographics included in this dataset are not directly available anymore from the Dutch government website. In appendix A, a table with all the indications, titles and filenames, and sources is present to ensure that each of these infographics could be redownloaded for reproducibility of this study.

4 Results

In this chapter, the results of the analysis that was set out in the previous methodology chapter are discussed and analyzed. In the first part of this chapter, information about the analysis is given. Hereafter, the general findings that are found in the dataset are discussed, as well as the general results per sub question variable. Hereafter, the main findings on the variable of the research question are presented.

4.1 General findings

The data analysis was conducted by scoring individual sub-question variables in a data matrix in SPSS, using dichotomous variables, and individually scoring each data entry. The first sub question variable that was coded was the law of proximity. This was done to ensure that the later data entries did not require revisions for the law of similarity. Based on the literature, it was necessary that this is done. The process of coding is done by checking if a visual percept in the infographic satisfies the conditions of the specific operationalization of that sub question variable.

Gestalt law	# of instances	% of all documents (n = 33)
Law of similarity	31	94%
Law of continuation	8	24%
Law of closure	22	66%
Law of symmetry	19	57%
Law of proximity	31	94%
Law of common fate	5	15%
Law of past experience	28	84%
Total	144	

Table 1: Frequency table of analysis codes

As can be seen in Table 1, a Total 144 gestalt laws of visual perception were observed to be utilized across 33 infographics published by the Dutch government, as seen in Table 1 In the documents, the law of similarity was the most used law of visual perception, which was present in all of the observed infographics in the dataset. It was found mostly in text grouping which similar speech bubbles, wherein the text lied that was grouped together using this principle, in conjunction with the law of proximity. In the observed dataset, the law of common fate was least observed. Theory did not indicate necessarily that common fate is a principle that is not often found; however the definition of the law of common fate suggests that it is more aimed towards visual perception of moving percepts, rather than static percepts, such as illustrations on paper. Whenever it was coded however, there was a clear pattern of motion observed in the infographic.

4.2 Analysis of the sub question variables & research question variable

In the dataset, each of the laws of visual perception where individually coded and analyzed, and the results will firstly be discussed in order of analyzed sub question variables. In the next chapter, the implications of the results of these analyses are discussed.

4.2.1 'Gestalt' law of Similarity

The presence of the law of similarity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Law of similarity not present	2	6,1	6,1	6,1
	Law of similarity present	31	93,9	93,9	100,0
	Total	33	100,0	100,0	

Table 2: Frequency table of the presence of the law of similarity

To assess sub question 1 posed in the introduction, "To what extent do the infographics published by the Dutch government adhere to the 'gestalt' law of Similarity?", it was found to be utilized in 33 of the 33 infographics in the that were in the dataset. In Table 2, a frequency table is produced using SPSS of the sub question variable 'law of similarity. In this table, in the first column, the variable labels of the specifically coded sub question variable are mentioned. In the second column, the frequencies of each of these variable codes are shown. In the third column, the percentage of each of these variable codes is shown, and it can be seen that 93.9% of the infographics in the dataset show presence of the law of similarity. (The explanation of the results tables will not be explained in the next paragraphs of the sub question variables, as these contain the same lay-out and information, it just applies to that specific law rather than the law of similarity). However, due to the findings of Peterson & Berryhill (2013), it was coded 31 out of 33 times, as seen in Table 2. In two cases the law of similarity was present, but it did not satisfy a specific condition. It was required to also have the law of proximity present to produce a salient result.

It is evident that the law of similarity sees a widespread use case in the infographic design of the Dutch government. The effects that were found in the theoretical framework that were tied to the law of similarity, such as the positive effect on visual working memory, are deemed to be present in the covid-19 infographics.

4.2.2 'Gestalt' law of continuation

Presence of the law of continuation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Law of continuation not present	25	75,8	75,8	75,8
	Law of continuation present	8	24,2	24,2	100,0
	Total	33	100,0	100,0	

Table 3: Frequency table of the presence of the law of continuation

To assess sub question 2 posed in the introduction, *"To what extent do the infographics published by the Dutch government adhere to the 'gestalt' law of Continuation?"* it was found present in 24,2% (8 of the 33) of the infographics that were present in the dataset, as seen in Table 3. Based on the findings in the theoretical framework, this means that the reader of the infographics that were posted, were only visually guided in 8 of the 33 infographics in the dataset. The usage of the law of continuation is minimal, and thus the impact of the law of continuation on the infographics could be considered quite low. The effects laid out in the theoretical framework, as the guidance of motion, are only present in a quarter of the infographics published by the Dutch government.

4.2.3 'Gestalt' law of closure

Presence of the law of closure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Law of closure not present	11	33,3	33,3	33,3
	Law of closure present	22	66,7	66,7	100,0
	Total	33	100,0	100,0	

Table 4: Frequency table of the presence of the law of closure

To assess sub question 3 posed in the introduction, "To what extent do the infographics published by the Dutch government adhere to the 'gestalt' law of Closure?", it was found to be present in 66.7% (22 out of the 33) of the infographics that were analyzed in the dataset, as seen in Table 4. Based on the findings in the theoretical framework, in 22 out of those 33 infographics, the effects of the law of closure will be present more often than not in the published government infographics. The effects laid out in the theoretical framework, such as the easier target detection as described by Kovacz and Julesz (1993) are deemed to be less present than the bulk of the other laws of visual perception.

4.2.4 'Gestalt' law of symmetry

Presence of the law of symmetry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Law of symmetry not present	14	42,4	42,4	42,4
	Law of symmetry present	19	57,6	57,6	100,0
	Total	33	100,0	100,0	

Table 5: Frequency table of the presence of the law of symmetry

To assess sub question 4 posed in the introduction, "To what extent do the infographics published by the Dutch government adhere to the 'gestalt' law of Symmetry?", it was found to be present 57.6% of the times in the infographics that were analyzed in the dataset, as seen in Table 5. Based on the findings in the theoretical framework, this means that relatively often the positive effect on the aesthetic pleasingness (Bauerly &Liu, 2008) of the infographics is found in the covid-19 response. However, due to the limited effect on the short term memory, the law of symmetry finds little effect on the overall performance of the infographics published by the Dutch government.

4.2.5 'Gestalt' law of proximity

Presence of the law of proximity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Law of proximity not present	2	6,1	6,1	6,1
	Law of proximity present	31	93,9	93,9	100,0
	Total	33	100,0	100,0	

Table 6: Frequency table of the presence of the law of proximity

To assess sub question 5 posed in the introduction, "To what extent do the infographics published by the Dutch government adhere to the 'gestalt' law of Proximity?", it was found to be present and utilized in 93.9% of the cases that were contained in this dataset, as seen in Table 6. Based on the findings in the theoretical framework, it means that the effects of the law of proximity will be found in nearly every published government infographic that is related to the covid-19 response. The effects of the law of proximity are that the information are more easily committed to short term memory in the correct usage of this effect, which in turn means that because of the abundance of use of this gestalt law, the infographics of the Dutch government are subsequently more easy to commit to short term memory, as supported by the theoretical framework.

4.2.6 'Gestalt' law of common fate

Presence of the law of common fate

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Law of common fate not present	28	84,8	84,8	84,8
	Law of common fate present	5	15,2	15,2	100,0
	Total	33	100,0	100,0	

Table 7: Frequency table of the presence of the law of common fate

To assess sub question 6 posed in the introduction, "To what extent do the infographics published by the Dutch government adhere to the 'gestalt' law of common fate?", it was found to be present and utilized in 15.2% of the cases that were contained in this dataset, as seen in table 7. Based on the findings in the theoretical framework , the effects of effective usage of the law of common fate are not expected to be contained a lot in the covid-19 infographics published by the Dutch government. The result of the low amount of law of common fate presences in the dataset was partially expected, since the theoretical framework describes the law of common fate more as a moving visual percept, which is difficult to be utilized in static imagery, such as infographics.

4.2.7 'Gestalt' law of past experience

Presence of the law of past experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Law of past experience not present	5	15,2	15,2	15,2
	Law of past experience present	28	84,8	84,8	100,0
	Total	33	100,0	100,0	

Table 8: Frequency table of the presence of law of past experience

To assess sub question 7 posed in the introduction, "To what extent do the infographics published by the Dutch government adhere to the 'gestalt' law of past experience?", it was found to be present and utilized in 84.8% of the cases that were contained in this dataset, as seen in table 8. Based on the findings in the theoretical framework, the effects of effective usage of the law of past experience should be found in a large part of the published infographics as covid-19 response by the Dutch government.

4.2.8 The gestalt laws of visual perception

To assess the research question posed in the introduction, ,about the extent of presence of gestalt laws of visual perception, a mean score of 63.2% is found present in the dataset. This means that in every infographic published by the Dutch government on covid-19 response (in this dataset), on average there is an adherence of 4 of the 7 tested laws of visual perception. In the results, it showed that in the majority of the cases (24 of 33) there were 4 or 5 laws of visual perception present in the infographic, as seen in Table 10. This means that many of the positive effects laid out in the theoretical framework, are found to be present in the analyzed infographics. Next to this, it is also important to note that there are no infographics published that does not at least satisfy 2 of the gestalt principles of visual perception, which means that these infographics will experience at least some of the positive effects that were described in the theoretical framework. On average, with an adherence of 63.2% on average, the gestalt laws of visual perception are present in all of the analyzed infographics in this dataset.

Gestalt laws of visual perception

	N	Minimum	Maximum	Mean	Std. Deviation
level of adherence to The gestalt laws of visual perception	33	,29	,86	,6320	,13846

Table 9: Level of adherence to gestalt laws of visual perception

Level of adherence to The gestalt laws of visual perception

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	,29	1	3,0	3,0	3,0
	,43	4	12,1	12,1	15,2
	,57	12	36,4	36,4	51,5
	,71	12	36,4	36,4	87,9
	,86	4	12,1	12,1	100,0
	Total	33	100,0	100,0	

Table 10: Table of distribution of adherence to gestalt laws of visual perception

5 Conclusion

To assess the research question posed in the intro of this research project, an analysis has been conducted to study the gestalt principles of perception in the covid-19 infographics published by the Dutch government. From the analysis, it became clear that there is a fairly high (~63 %) of gestalt principles of visual perception present in the dataset that was selected with the selected method of data analysis. Based on the empirical evidence, it can be concluded that there is a fairly high degree of gestalt principles used in the infographics related to the covid-19 pandemic, published by the Dutch Government. In particular, the gestalt laws of proximity (94% of cases), similarity (93.9% of cases) and past experience (84.8% of cases) have been observed to be present in the selected dataset. Thus, to assess the research question;

"*To what extent do the infographics published by the Dutch government adhere to the gestalt laws of visual perception?*"

Based on the empirical data found in the analysis, the infographics published by the Dutch government in response to the covid-19 pandemic have shown a high presence of the laws of visual perception from gestalt theory. This, connected with the literature, shows that the Dutch government produced efficient infographics with neatly intertwined designs that made plentiful usage of the gestalt principles, which allowed the infographics to be more coherent, and understandable as a public communications tool.

What this means for the citizens in the Netherlands, is that high quality infographics were delivered to them to inform them about the covid-19 measures in the Netherlands, since these were in line with many gestalt laws of visual perception, which have many different positive effects on the infographics, which subsequently make them more clear and unified. However, some of the infographics in the dataset showed a relative low amount of adherence to the gestalt principles of visual perception, and on basis of the findings in the theoretical framework, will subsequently receive a less positive impact on the visual perception of the Dutch citizenry.

5.1 Discussion and research agenda

As mentioned in the conclusion, the findings that are presented in this research are based on empirical findings that are only supported by its' theoretical framework, and could be impactful for the relevancy of the results of this research project. The result of the scoring based on the discretion of just the theoretical framework leaves room for bias in the scoring conditions that were stated in the operationalization, if the mentioned literature and resulted experiments deem to be irrelevant if the findings in these articles cannot be reproduced. Therefore, the following research agenda is proposed:

- A different method of operationalization of the sub question variables, based on computer-quantifiable data analysis, rather than the human scoring element, to take away the scoring bias of the researcher.
- Creation of different measures of the main research question variable, to give the ability to better assess the research question
- A reformulation of the main research question, to increase the generalizability of the results, and to have the ability to increase the dataset for more entries, which in return could result in a more accurate findings.

- Use more triangulation by incorporating in depth interviews with subject matter experts and the producers of these infographics

For following research, it is a necessity to have more quantitative methods to properly, and consistently analyze the dataset, to increase the reliability of the findings, rather than based on empirical findings.

To summarize, the current research project shows that the Dutch government used an adequate response in the infographics related to the covid-19 pandemic in the Netherlands, and there is enough room for research in this realm to build further upon.

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7 Appendix A: Data collection table

Id	Date	Title	Source
1	10.03.20	Het Corona-virus (voor laaggeletterden)	https://www.rijksoverheid.nl/documenten/publicaties/2020/03/01/poster-hygienemaatregelen-corona-voor-laaggeletterden
2	20.03.20	Vragen over het Coronavirus	https://www.rijksoverheid.nl/documenten/publicaties/2020/03/20/poster-welke-informatie-vind-je-waar-en-wie-kun-je-daarvoor-bellen
3	15.07.20	Zorg goed voor jezelf	https://www.rijksoverheid.nl/documenten/publicaties/2020/07/15/poster-zorg-goed-voor-jezelf
4	16.07.20	Vermijd de spits	https://www.rijksoverheid.nl/documenten/publicaties/2020/06/17/poster-vermijd-spits---500x760-mm
5	12.08.20	Testen op het coronavirus: Hoe maak je een afspraak?	https://www.rijksoverheid.nl/documenten/publicaties/2020/06/01/corona---factsheet-testen-op-het-coronavirus
6	18.08.20	Kom je terug uit een land met een oranje reisadvies vanwege corona?	https://www.rijksoverheid.nl/documenten/publicaties/2020/07/31/coronavirus-poster-dringend-advies-voor-thuisquarantaine
7	18.08.20	Testen op het coronavirus	https://www.rijksoverheid.nl/documenten/publicaties/2020/06/01/corona---factsheet-testen-op-het-coronavirus
8	12.10.20	Hoe werkt het bron- en contactonderzoek?	https://www.rijksoverheid.nl/documenten/publicaties/2020/06/01/corona---factsheet-hoe-werkt-het-bron--en-contactenonderzoek
9	16.10.20	Tips voor thuiswerken in coronatijd	https://www.rijksoverheid.nl/documenten/publicaties/2020/10/16/tips-voor-thuiswerken-in-coronatijd
10	16.10.20	Tips voor leidinggeven op afstand in coronatijd	https://www.rijksoverheid.nl/documenten/publicaties/2020/10/16/tips-voor-leidinggeven-in-coronatijd
11	17.10.20	Hoe maak je je eigen niet-medische mondkapje?	https://www.rijksoverheid.nl/documenten/publicaties/2020/05/09/covid-19-niet-medisch-mondkapje
12	20.11.20	Een goed werkend en veilig coronavaccin	https://www.rijksoverheid.nl/documenten/publicaties/2020/11/20/factsheet-een-goed-werkend-en-veilig-coronavaccin

1 3	24.11 .20	De weg naar vaccinatie tegen het coronavirus	https://www.rijksoverheid.nl/documenten/publicaties/2020/11/20/factsheet-de-weg-naar-vaccinatie-tegen-het-coronavirus
1 4	26.11 .20	Een mondkapje is hier verplicht	https://www.rijksoverheid.nl/documenten/publicaties/2020/11/26/coronavirus-posters-een-mondkapje-is-hier-verplicht
1 5	26.11 .20	Draag hier een mondkapje	https://www.rijksoverheid.nl/documenten/publicaties/2020/10/02/poster-draag-hier-een-mondkapje-a3-print
1 6	26.11 .20	Vanaf hier graag een mondkapje dragen	https://www.rijksoverheid.nl/documenten/publicaties/2020/10/02/poster-vanaf-hier-graag-een-mondkapje-dragen-a3-print
1 7	26.11 .20	Zo draag je een mondkapje	https://www.rijksoverheid.nl/documenten/publicaties/2020/10/02/poster-zo-draag-je-een-mondkapje-a3-print
1 8	22.12 .20	Testen bij klachten	https://www.rijksoverheid.nl/documenten/publicaties/2020/12/30/poster-testen-bij-klachten
1 9	22.12 .20	Thuisquarant aine door corona	https://www.rijksoverheid.nl/documenten/publicaties/2020/12/30/poster-thuisquarantaine-door-corona
2 0	27.01 .21	Werk thuis	https://www.rijksoverheid.nl/documenten/publicaties/2021/01/27/coronavirus-poster-werk-thuis
2 1	05.02 .21	Wanneer moet ik in quarantaine vanwege corona?	https://www.rijksoverheid.nl/documenten/publicaties/2020/10/15/factsheet-wanneer-moet-ik-in-quarantaine
2 2	26.04 .21	Maatregelen in onze winkel	https://www.rijksoverheid.nl/documenten/brochures/2021/04/29/poster-maatregelen-in-onze-winkel-wachten-bij-drukte
2 3	26.04 .21	Maatregelen in onze winkel(2)	https://www.rijksoverheid.nl/documenten/brochures/2021/04/29/poster-maatregelen-in-onze-winkel-maximaal-aantal-klanten
2 4	11.05 .21	Vakantieplan nen? Ga wijs op reis	https://www.rijksoverheid.nl/documenten/publicaties/2021/05/11/poster-reizen-en-vakanties-15-mei-2021
2 5	28.05 .21	Kunst en cultuur	https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/publicaties/2021/05/28/kunst-en-cultuur/210528_kunstencultuur_RO_FINAL+%282%29.pdf
2 6	28.05 .21	Openingspla n: stap voor stap meer mogelijk	https://www.rijksoverheid.nl/documenten/publicaties/2021/04/13/informatieblad-corona-13-april-2021
2 7	28.05 .21	Recreatie	Original link not available anymore, see https://drive.google.com/file/d/1J8fPOXgFsR44xV_aO1NaS0WJfJ2j3Z6Q/view?usp=sharing

2 8	28.05 .21	Spelregels voor sporten tijdens corona	Original link not available anymore, see https://drive.google.com/file/d/1G3_0BLTlFnwcA4nHDHcHzfXsAzB gAyQC/view?usp=sharing
2 9	28.05 .21	Horeca binnen en buiten open	Original link not available anymore, see https://drive.google.com/file/d/1VsYS8pncIXYRg8vTmB3_-NbKFmO247i2/view?usp=sharing
3 0	28.05 .21	Stap 3: bijna alles open	Original link not available anymore, see https://drive.google.com/file/d/1ROF8XeGW9oTsEFo1QDyhpgbnC fjNUs-B/view?usp=sharing
3 1	28.05 .21	Winkelen en boodschappe n doen	Original link not available anymore, see https://drive.google.com/file/d/12Yt5j8-uLNOWnCaqY5L6Q4QBQW4MI4HR/view?usp=sharing
3 2	28.05 .21	Basisregels voor iedereen	Original link not available anymore, see https://drive.google.com/file/d/1252pjDKHZWG9FK513Ou4eMhU9 EOGJkFM/view?usp=sharing
3 3	28.05 .21	Overzicht coronamaatr egelen per 5 juni	Original link not available anymore, see https://drive.google.com/file/d/17-R6JKC5XkTdYnk7QTL6pTcEX4kfJeX8/view?usp=sharing

These will also be provided in a folder in the data appendix.