

BACHELOR THESIS

# **CLEAN YOUR HANDS, PLEASE!**

**USING NUDGING TO IMPROVE HAND HYGIENE  
AMONGST DUTCH CITIZENS DURING COVID-19**

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Date: 10-11-2021

## **Abstract**

### *Objectives*

This study aims to test the effectivity of specific nudges, a watching eyes nudge and a gain frame nudge, in order to improve and increase hand hygiene among Dutch citizens in the public sphere during the COVID-19 pandemic. Research has shown that currently the baseline for using hand sanitisers is low among the Dutch population. Considering the dangers that COVID-19 and other viruses pose to an individual and a society, this study aims to provide insights regarding effective nudges that can be used to improve the general hand hygiene of Dutch citizens.

### *Methods*

For this study, a 2x2 between-subjects design field experiment was carried out. The interventions, four poster designs that included either a gain frame element and/or a watching eyes element, were applied to eight locations, and the effectivity was measured based on the amount of hand sanitiser that was used per design, as well as with a two-way ANOVA. In total, 128 measurements were recorded. Furthermore, a focus group was done as a pre-test to find the most effective intervention designs.

### *Results*

The results of this study show an insignificant model for the effects of a gain frame nudge and a watching eyes nudge on the use of hand sanitiser. Furthermore, the individual main effects and the interaction effect were insignificant. The measurements were further compared on the basis of the day of measurement, the location in which the intervention was presented, and the type of intervention. These measurements showed little difference between the grams of hand sanitiser used between interventions.

### *Conclusions*

From the results, it can be concluded that in this study, the interventions that included a gain frame nudge or a watching eyes nudge had no effect on an individual's behaviour regarding the use of hand sanitiser.

### **Keywords:**

priming – nudging – COVID-19 – pandemic – psychology

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## 1 Introduction

In the current COVID-19 pandemic, many organisations and instances are looking for ways to protect their employees, consumers and visitors from getting into contact with COVID-19. In the Netherlands, this can be seen in provoking washing hands regularly, provoking the use of face masks, and keeping 1.5 meters distance from others. These basic rules or interventions were largely provided by the government (Rijksoverheid, n.d.) and taken up by local organisations.

According to the WHO (2020), washing or cleansing hands regularly is important because “it starts with your hands”. Viruses easily spread via the hands of an individual because they touch many different surfaces and other individuals. Consequently, touching the face could lead to infection with COVID-19. The importance of good hand hygiene is also described in multiple other studies. According to Erasmus et al. (2010), insufficient hand hygiene is a universal problem. Like their study, most studies considering hand hygiene were performed in the context of a healthcare environment such as a hospital. The results showed that the baseline for good hand hygiene is relatively low in the medical field. Furthermore, a study done in the Netherlands (Weijers et al., 2021) showed that during the pandemic and among the general public, compliance to hand hygiene is also relatively low (33.3%). By focusing on an intervention for the general public, the amount of Dutch citizens infected with COVID-19 can be lowered.

The government has created interventions that are communicated to the public mostly via press conferences from the government directly, but also through campaigns on multiple social media platforms. More specifically, Rijksoverheid (n.d.) has provided all entrepreneurs with ‘complete campaign toolkits’ that can be downloaded and printed for commercial use. In this toolkit, one can find posters, videos and images that can be shared with the public in order to prevent the spread of the virus. An example of this material can be found in figure 1.

**Figure 1**

Poster provided by the Dutch government to prevent the spread of COVID 19



These interventions have been researched by the government, in a document where the ‘Alleen Samen’ (‘only when we work together’) campaign is evaluated for its effectivity. In general, the studies show that Dutch citizens are becoming less worried about the virus and adhere to the regulations less than when the pandemic first started (Dienst Publiek en Communicatie, 2021). This is worrisome for controlling the virus in the Netherlands. Subsequently, non-compliance to hand hygiene is an issue in the Netherlands, especially during the COVID-19 pandemic. In a study from Hilt et al. (2020) that was done before the pandemic, it is found that in a Dutch general practitioner’s office, overall compliance to hand hygiene was just 37%. Aside from the possibility of improvement, the necessity of improvement is high.

In order to change or improve behaviour, different theories can be taken into account. An example of such a model is the Theory of Planned Behaviour, which explains how individuals make decisions. Furthermore, social proof theory is a phenomenon that has shown to be important in social science (Cialdini, 1984). This theory elaborates on the effect that social control can have on an individual’s behaviour. Lastly, priming and nudging have been regularly used in the social sciences.

Nudging has proven to be a useful technique to steer people's behaviour. It is referred to as a psychological intervention technique to create subtle changes in the environment that can alter people's behaviour (Thaler & Sunstein, 2008). More specifically, a nudge changes behaviour in a predictable way without forbidding any options or significantly changing an individual's economic incentives. Nudging has proven to be successful in changing human behaviour in various fields (Szasz et al., 2018). As found in a study by Wansink et al. (2007), changing the plate size in a cafeteria from 12 inches to 10 inches decreased the amount of food eaten by 22%. Furthermore, a nudge that has been used regularly is the 'fly in the urinal', which was first done on Schiphol Airport in 1999 (Hooker, 2017). A fly is portrayed in men's urinals in order to nudge them to aim better during their toilet visit. This relatively small intervention reduced the amount of spillage by 80% (Hooker, 2017). These studies show the tip of the iceberg in terms of the potential that nudges can have in social science.

There are multiple nudges that have proven to be successful in the field of social science. An example of this is the watching eyes effect. Watching eyes, i.e. a photo of eyes or the abstract shape of eyes, give the individual the idea that they are being watched, which provokes a behavioural change (Pfafftheicher & Keller, 2015). Furthermore, a useful intervention for behavioural change can be a poster with information regarding the desired behaviour. Quotes such as "using hand sanitiser can decrease infection rates by 80%" can provoke an individual to comply as it informs them of the benefits of using hands sanitiser. This example is called a gain frame nudge, as it shows an individual what the direct effects of their actions are, in a positive frame.

The aim of this research is to find the most effective watching eyes nudge and the most effective gain frame nudge, and to test these nudges separately and combined on Dutch citizens of all ages in order to provoke them to clean their hands regularly in the public sphere during the COVID-19 pandemic. Thus, the research questions for this study are:

**RQ<sub>1</sub>:** *What is the effectivity of a gain frame nudge and a watching eyes nudge on the behaviour of Dutch citizens of all ages to clean their hands in the public sphere during the COVID-19 pandemic?*

**RQ<sub>2</sub>:** *Can an interaction effect be identified between a gain frame nudge and a watching eyes nudge, in the context of hand hygiene?*

In order to answer these questions, previous literature will be thoroughly researched and analysed. Then, a pre-test will be done to design the most effective promising. Lastly, an intervention study will be done to find whether these interventions are useful in the context of this study, namely in the Netherlands during the COVID-19 pandemic. This thesis will provide background knowledge in the theoretical framework, after which it will elaborate on the chosen methodologies. Lastly, the results will be laid out and discussed, finishing with a conclusion and recommendations for future research.

## 2 Theoretical framework

In the context of hand hygiene and nudging, many studies have been done. In this section, theoretical background regarding classic behavioural theories, nudging, watching eyes, gain frame nudges, COVID-19 and hand hygiene will be discussed.

### 2.1 Classic behavioural theories

The Theory of Planned Behaviour (TPB) is a classical model that explains how individuals make decisions. This decision roughly consists of three aspects: (1) the individual's attitude towards the product or behaviour, (2) the subjective norm and (3) perceived behavioural control (Ajzen, 1991). In the case of hand hygiene, the choice whether or not to wash hands depends on where the individual is, how they feel towards hand hygiene and how easy or difficult it is to wash their hands. Furthermore, the theory is mostly based on the intrinsic motivation that an individual has to take a certain action. In order to maximise the amount of people that wash their hands multiple times every day, especially during the COVID-19 pandemic, the Theory of Planned Behaviour should be taken into account.

The concept of social proof is an interesting addition to the Theory of Planned Behaviour, that mostly relies on extrinsic motivation. First introduced by Cialdini (1984), social proof explains how individuals depend on looking at and imitating others when they are uncertain about a decision. According to Aronson et al. (2005), "we conform because we believe that others' interpretation of an ambiguous situation is more accurate than ours and will help us choose an appropriate course of action". This means that in a public situation where an individual would be expected to sanitise their hands, this individual would adhere to this expectation if they find that others do the same. In the current study, to avoid bias from the social proof theory and to isolate the effect of the interventions, this means that the location of the interventions should not be too crowded and that individuals should be alone as much as possible when the intervention is presented.

### 2.2 Nudging

Nudges are behaviour interventions that can be categorised under either system 1 or system 2 thinking. According to Kahneman (2011), humans think in system 1 and system 2 processes. System 1 processing happens quickly, emotionally and automatically, without thinking. Oppositely, system 2 processing takes a long time, happens rationally and has a thought process at the base. The activities taking place in the brain during system 2 processing require effort (Kahneman, 2011). In the current study, the aim is mostly towards system 1 thinking. These nudge types have the ability to affect system 1 processing, avoiding system 2, and thus influencing thoughts and behaviour without a lot of effort for the individual (Kahneman, 2011). This is promising, as it means that behaviour can be

influenced without the individual taking notice of it. Nudging in this way thus offers a valuable and effective technique to change people's thoughts and behaviours.

Looking at the way nudges are used in practice, we find that nudges are mostly about visible influence (Evans et al., 2017). Thus, with nudges, an individual is aware that a certain behaviour is preferred and they can choose to adhere to that behaviour, or to do something different. An example of such a system 2 nudge is the fly in the urinal, where a sticker of a fly is placed in a urinal in order to nudge men to aim better during their toilet visit. On the contrary, an example for system 1 thinking can be found in supermarkets, where placing healthy food on eye level can enhance healthy food purchases. This type of nudge, a visibility enhancement (Cadario & Chandon, 2020), is one of many ways that healthy or preferred behaviour can be encouraged among individuals. Aside from use in healthcare or general health in society, nudges can be used in a wide range of sectors such as education, business and governmental campaigns.

### *2.3 Types of nudges*

There are many different types of nudges that are effective in different situations. As described by Cadario and Chandon (2020), nudges can be roughly categorised into three general categories in terms of what part of an individual they influence: (1) cognitively oriented nudges, (2) affectively oriented nudges and (3) behaviourally oriented nudges. Cognitively oriented nudges have the goal of influencing what an individual knows, and an example is a poster with information about the effects of behavioural change. Affectively oriented nudges aim to influence the feelings of the individual, without changing what they know. For instance, hedonic enhancements like clear statements concerning health on food packaging are considered affectively oriented nudges. Lastly, behaviourally oriented nudges try to change the behaviour of the individual in a certain situation, without changing necessarily what they know or feel. An illustration of this is when a bicycle is easier to hire or reach than a scooter. Because of convenience, the behaviour is changed to be more preferable. Furthermore, in their study, Cadario and Chandon (2020) elaborate on seven types of nudges that they have found useful for healthy eating behaviours: (1) descriptive nutritional labelling, (2) evaluative nutritional labelling, (3) visibility enhancements, (4) hedonic enhancements, (5) healthy eating calls, (6) convenience enhancements and (7) size enhancements. Although their study is focused on healthy eating, the nudges they provide can be used in other fields of study as well. More specifically, looking at healthy living in general, visibility enhancements, hedonic enhancements and convenience enhancements seem to be most promising nudge types. Visibility enhancements refer to nudges that place the preferred option closer to eye-height or closer to sight in general (Cadario & Chandon, 2020). Hedonic enhancements aim to make the preferred product or service more attractive using “vivid hedonic descriptions or attractive displays, photos or containers” (Cadario & Chandon, 2020, p. 469). Lastly, in their study, they introduce convenience enhancements as nudges that make it easier or

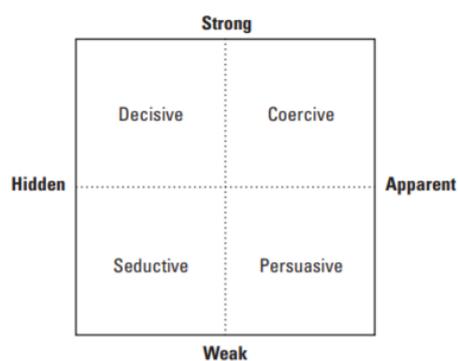
more convenient to choose the preferred option. These nudges have shown to be effective, and are not tied to healthy eating habits only; they can be used in other contexts. The results from the study done by Cadario and Chandon (2020) provide an interesting insight into nudging: behavioural nudges are most effective, and cognitive nudges are least effective. Thus, a focus on behavioural nudges could provide most promising or effective results.

Aside from how nudges influence an individual, nudges can be divided into categories on the basis of their force and salience. As can be found in the study of Tromp et al. (2011), nudges are divided into four categories (see figure 2). A nudge is either decisive, coercive, seductive or persuasive.

A decisive nudge is a strong intervention, yet implicit. An example is a high-story building that does not have an elevator and thus forces an individual to take the stairs. A coercive nudge is strong and visible, such as a security camera in the supermarket. Seductive nudging is for example the fly in the urinal, which internally motivates an individual. Lastly, persuasive design is rather weak but apparent, and could take forms of a campaign or a sign that directs towards the preferred behaviour or choice.

**Figure 2**

*Four types of influence based on the dimensions of force and salience.*



*Note.* Source: Tromp et al. (2011)

In addition to the previous studies, Hollands et al. (2013) provide remarkable understanding of nudges, or ‘choice architecture interventions’. In the context of health-related behaviour, Hollands et al. (2013) provide the following definition of a choice architecture intervention:

Interventions that involve altering the properties or placement of objects or stimuli within micro-environments with the intention of changing health-related behaviour. Such interventions are implemented within the same micro-environment as that in which the target behaviour is performed, typically require minimal conscious engagement, can in principle

influence the behaviour of many people simultaneously, and are not targeted or tailored to specific individuals. (p. 3)

From this, it can be noted that nudges must be noticeable, understandable for each and every individual and should be general and non-specific to certain individuals. Moreover, Hollands et al. (2013) propose a typology for choice architecture interventions, which can be used as a basis for different nudges that can be applied. In total, they propose nine intervention types, with focus on: (1) ambience, (2) functional design, (3) labelling, (4) presentation, (5) sizing, (6) availability, (7) proximity, (8) priming and (9) prompting. Although this overview provides an interesting basis for this study, it should be noted that the aim of Hollands et al.'s study (2013) was to find what nudges improve overall health behaviour in individuals. Therefore, the effects of these changes in the choice architecture were measured in terms of changes in diet, physical exercise, alcohol use and tobacco use. These are all concerned with personal goals an individual might have regarding their health. Other nudges, aside from the types identified in Hollands et al.'s study (2013), can be promising outside the context of personal health. In the following sections, two examples of nudges are discussed: gain frame nudges and watching eyes nudges.

#### *2.4 Gain frame nudge*

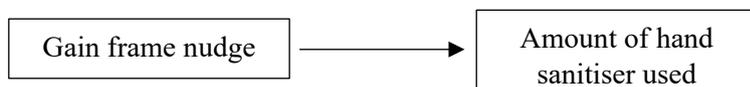
Messages that contain a so-called 'gain frame' have proven to be successful in steering the behaviour of people during the pandemic. Gain frames originate from the Prospect Theory (Zhao & John, 2021) and can be defined as frames or nudges that show what could be gained if an individual complies to the preferred behaviour. Caris et al. (2018) have used gain frame nudges that for instance indicated 'X amount of people clean their hands with this hand sanitiser'. In the hospital setting, this has proven to be a useful intervention, as more employees used hand sanitiser when the gain frame was presented to them. Furthermore, Zhao and John (2021) have researched the effectiveness of gain frames in the context of natural disasters. In their study, they found that gain frame messages are more likely to lead to risk-averse decisions in two out of three natural disasters. Adding to this evidence, Sasaki et al. (2021) test the effectivity of five different nudge types in the context of COVID-19 behaviour regulations, and find that only a gain frame message is effective in improving behavioural compliance. More specifically, they presented five different frames of the same message. The gain frame message, which indicated that 'by complying to the rules, the lives of people close to you can be saved', was the only effective frame for this study. Because of the outcomes of these studies, the following hypothesis can be formed for this research:

**H<sub>1</sub>:** The presence of a gain frame nudge will have a positive effect on performed hand hygiene; more hand sanitiser will be used when a gain frame poster is present in comparison to the intervention where the gain frame nudge is absent.

The corresponding model to this hypothesis can be found in figure 3.

### Figure 3

*Model with gain frame nudge and use of hand sanitiser*



### 2.5 Watching eyes nudge

A frequently used nudge is the watching eyes effect. This effect aims to change human behaviour by the presence of fake eyes or a (fake) camera, respectively on a poster or directly in the environment. These interventions give the individual the idea that they are being watched, which provokes a behavioural change (Pfattheicher & Keller, 2015). This effect holds close resemblance to the social presence theory and social proof theory, as they are all based on extrinsic motivation by pressure from others. Interestingly, watching eyes or social presence from an individual's 'in-group' (somebody they know or care about) appears to be more effective than when they are 'watched' by somebody from their 'out-group' (somebody they do not know) (Shinohara & Yamamoto, 2018). Possibly, this effect also holds for abstract or realistic eyes, as realistic eyes are familiar and abstract ones are not. Furthermore, according to Baillon et al. (2012), the watching eyes effect is stronger for actions that are socially oriented, rather than individual actions. The watching eyes effect is a strong nudge that has proven to be successful in encouraging preferred behaviour in various fields and studies, even when the image was rather vague or more abstract (Haley & Fessler, 2005).

Proof of the effectiveness of the watching eyes effect can be found in multiple studies. Firstly, Bateson et al. (2006) researched the effect that watching eyes has on the amount of money people put in an "honesty box" in the coffee room of their workplace. Interestingly, when a picture of eyes was placed next to the box, the amount of money in the donations tripled. Similarly, Ekström (2012) found that the watching eyes effect was also significant for the amount of money that individuals donated to charity in Swedish supermarkets. More specifically, the eyes increased the amount of money that was donated by 30%. An important variable of this study that should be taken into account, however, is the business of the supermarket. The effect was only significant when relatively few people visited the shop. This same result was found by Ernest-Jones et al. (2011), who showed that customers of a cafeteria reduced their littering by nearly 50% when watching eyes were present, but only when the cafeteria was relatively quiet. Finally, in line with these outcomes, Powell et al. (2012) show that in quiet supermarket environments, displaying pictures of eyes on the charity collection boxes increased donations with a stronger effect than when the supermarket was crowded. From these studies, it can be

noted that the watching eyes nudge can be an effective intervention if used in the right way. Thus, the following hypothesis can be formed:

**H<sub>2</sub>:** The presence of watching eyes will have a positive effect on performed hand hygiene; more hand sanitiser will be used when a watching eyes nudge is present compared to the intervention where a watching eyes nudge is absent.

The corresponding model to this hypothesis can be found in figure 4.

**Figure 4**

*Model with watching eyes and use of hand sanitiser*



## 2.6 COVID-19 pandemic and hand hygiene

Hand hygiene, also before the COVID-19 pandemic, appears to be a topic that has received a lot of attention. Many studies have researched the use of hand sanitiser, especially in the medical field. Although good hand hygiene as a preventive for spreading infections and diseases is often well-known by many health care workers and lay people, the performed hand hygiene is often insufficient (Gaube et al., 2021). In line with this, according to Erasmus et al. (2010), noncompliance with hand hygiene guidelines is a universal problem. They note that theoretical models from behavioural sciences should be used internationally, and should be adapted in order to better explain the complexities of hand hygiene in the context of hospitals. Interestingly, in their study they find that hand hygiene behaviour seems to be mostly explained by the Theory of Planned Behaviour. Furthermore, looking at the type of nudge that could be used to improve hand hygiene, Erasmus et al. (2010) find that accessibility of materials and performance feedback are important in the promotion of hand hygiene. In addition to these findings, Gaube et al. (2021) describe that the most successful interventions for improving hand hygiene were grounded in theory. Therefore, for this study, the intervention that will be designed must be based on theory that has proven to be useful in social sciences. An example of this is the previously discussed Theory of Planned Behaviour, which is further described in both the study of Erasmus et al. (2010) as well as the study of Gaube et al. (2021).

Aside from the influence of other individuals, other influences from the environment can determine whether or not an individual sanitises their hands. In a study from Caris et al. (2018), the reasons for non-compliance to hand hygiene were discovered. Having that as a basis, they designed a poster that should improve the use of hand sanitisers. These posters, which were based on the ‘band-

wagon effect’ and the ‘loss aversion and relative risk’, improved the use of hand sanitisers significantly in the hospital in which they were placed. Furthermore, Caris et al. (2018) point out an interesting fact regarding the baseline of hand sanitiser use. They state that when the prevalence of a healthcare-associated infection is low, non-compliance of hand hygiene is higher as individuals believe that chances of transmitting an infection through lack of hand hygiene is lower. This finding is especially relevant in the hospital setting in which their study was based. Although this article was written before the COVID-19 pandemic, there is still valuable information in that statement. It shows that now, probably the opposite is also true: as many people are now aware of the potential risk non-compliance to hand hygiene can have in terms of spreading COVID-19, the baseline is expected to be higher than before the pandemic.

In addition to these models, Gaube et al. (2021) describe two other theoretical models that have proven to be useful in field of hand hygiene. These are the Health Action Process Approach (HAPA) and the Theoretical Domains Framework (TDF). The HAPA model contains some general constructs that define it. It is based on self-efficacy, outcome expectancies, risk perception, intention, planning, barriers and resources and action control (Gaube et al., 2021). The TDF model is a good addition to this, with its main constructs being amongst others knowledge, skills, anticipated outcomes, intention, and social influences. These three models, the Theory of Planned Behaviour, the HAPA model and the TDF model provide interesting perspectives on the most efficient intervention to improve hand hygiene among Dutch citizens. Based on this information, the intervention should contain a number of constructs in order to be most effective, as shown in table 1.

**Table 1**

*Factors the intervention should contain*

Construct	Explanation
Outcome expectancies	The intervention should explain to the individual what can be expected after sanitising their hands.
Self-efficacy	The intervention should be accessible and easy to use.
Motivation and goals	The intervention should explain to the individual why performing hand hygiene is important.
Behavioural regulations	The intervention should motivate the individual to practise hand hygiene.

As the study is a 2 by 2 design, the main effects of watching eyes and a gain frame nudge will be tested. Moreover, the interaction of these variables will be explored in relation to the use of hand sanitiser. There are no previous studies that have tested this, so in this research that will be explored.

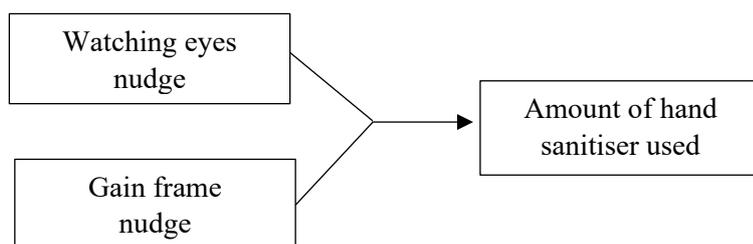
Thus, the following question is added to the main research question:

**RQ<sub>2</sub>:** *Can an interaction effect be identified between a gain frame nudge and a watching eyes nudge, in the context of hand hygiene?*

The accompanying model to this question can be found in figure 5.

### Figure 5

*Interaction model with watching eyes nudge, gain frame nudge and use of hand sanitiser*



## 2.7 Research purpose

From this literature study, it can be noted that a lot of relevant research has been done. There is a lot of knowledge about how nudges work and the psychological effects they can have on behaviour. Furthermore, there are some studies done towards the effectiveness of nudges on the use of hand sanitisers. However, these studies often took place in a hospital context and were not concerned with the ‘general public’. Additionally, only one of these studies was done during the COVID-19 pandemic in the Netherlands (Weijers & Koning, 2020). This study, however, had insignificant results. The use of a salience nudge and a gain frame nudge in a Dutch shopping street proved not to be strong enough to significantly improve the hand hygiene of Dutch citizens. In their discussion, the researchers touch on possible reasons that cause people to refrain from using the hand sanitisers. Unfortunately, this is mostly speculation as not much is known about the behaviour of individuals during the pandemic. Therefore, this research aims to fill this gap by attempting to provide knowledge on what the best way to improve hand hygiene among Dutch citizens during a pandemic could look like. The study adds to previous literature by not only focusing on the medical field, but rather looking at the general Dutch public. It will provide insights in the most effective ways to provide interventions or nudges to encourage lay people to perform proper hand hygiene during the COVID-19 pandemic using a 2 by 2 design.

### 3 Methods

In this section, the methods section will be laid out. The ethical considerations, pre-test, participants, location, design, procedure and analysis of the study will be discussed in order to explain how the study was done.

#### 3.1 Ethical considerations

Ethical approval for this research was granted from the Ethics Committee of the Faculty of Behavioural, Management and Social sciences from the University of Twente. During the study, the behaviour of individuals was recorded after the fact, meaning that no personal data was collected and individuals were not identified.

#### 3.2 Pre-test: focus group

In order to find the best intervention design, a pre-test was done on the basis of the analysed literature. In this pre-test, five participants were present in a focus group that aimed to find the most suitable intervention to maximise good hand hygiene among lay people. During the focus group, existing posters, slogans, images and watching eyes that were related to prevention of COVID-19 infection or to hand hygiene were presented.

From this pre-test, it was noted that the most important elements are strong colours, little text, clear images and strong eyes. The text should convey the message of importance of washing hands, but should not be too long. Furthermore, participants preferred realistic looking eyes with a strong (but not angry) expression. The input from this pre-test was used in creating the final designs, and these designs were sent back to the participants to see if the input from the focus group had been used properly. A transcript of the focus group can be found in Appendix A.

#### 3.3 Participants

Participants consisted of individuals residing in the Netherlands of all ages and backgrounds. For the focus group, participants were recruited using convenience sampling via online platforms. The researcher asked people in their direct environment to take part in the focus group. The participants for the focus group were diverse in terms of age, gender and background. Two of the participants were male, whereas three were female. Furthermore, the participants in the focus group were relatively young ( $M = 28.2$ ,  $SD = 18.3$ ).

For the intervention study, participants were recruited on the basis of whether they entered the location in which the research took place. Because the researcher was not present, the estimated age or gender of these participants is not known. However, due to the environment in which the research was done, a university sports facility, some assumptions can be made about the group of participants. It is expected that most participants were students or employees of the facility, and thus that the gender and

age of participants are mixed. The participants are most likely interested in sports or healthy living, considering the environment.

### *3.4 Location*

The study was carried out in a sports facility of a university in the North of the Netherlands. The location attracts approximately 1,000 people per hour on average and is mostly open to students and employees of the university.

### *3.5 Design and procedure*

For this study, a 2 by 2 between subjects design was applied. This design was chosen because it allows to test each element's main effects, but also makes it possible to measure interaction effects. Four interventions were designed, where the gain frame nudge and the watching eyes nudge either were present, or they were not. The interventions can be found in figure 6.

The interventions were hung in eight different, but comparable areas within the building (four changing rooms, one fitness room, two toilets and one sports hall). All areas seemed comparable in the amount of visitors they attracted. Aside from an intervention in the form of a poster, all locations included a small pump with hand sanitiser. An example of the set-up can be found in figure 7. Before data collection, all pumps were filled with hand sanitiser and the weight of each bottle was measured and recorded.

**Figure 6**

*Intervention designs*



Intervention 2.1: control intervention



Intervention 2.2: with watching eyes



Intervention 2.3: with gain frame



Intervention 2.4: with watching eyes and gain frame

**Figure 7**

*The setup of the intervention and the hand sanitiser on one of the locations*



During data collection, the researcher was present at the facility, and measured the grams of hand sanitiser of all bottles every two hours: at 10:00, 12:00, 14:00, 16:00 and 18:00. This data was recorded in an Excel sheet. An example of how the Excel sheet looks can be found in Appendix B. By measuring the weight of each individual bottle, the effect of the intervention could be measured. If the weight of a hand sanitiser bottle dropped rapidly, then the intervention most likely would have more effects on an individual than if the weight of the bottle remained the same throughout data collection. However, this could only be true if the measurements accounted for the location. Thus, in order to prevent bias of locations that were busier than others, interventions were hung in a different location every day. In table 2, an overview can be found of this schedule. As the intervention locations were close to each other, measuring all the bottles took a maximum of five minutes, so no bias was possible in that regard.

Finally, with this design, the division of participants in regard to the interventions is not known. However, with the schedule presented in table 2, busier locations are accounted for as the interventions are not in the same location each day.

**Table 2**

*Order of the presented interventions*

	Day 1	Day 2	Day 3	Day 4
Location A	Intervention 2.1	Intervention 2.2	Intervention 2.3	Intervention 2.4
Location B	Intervention 2.1	Intervention 2.2	Intervention 2.3	Intervention 2.4

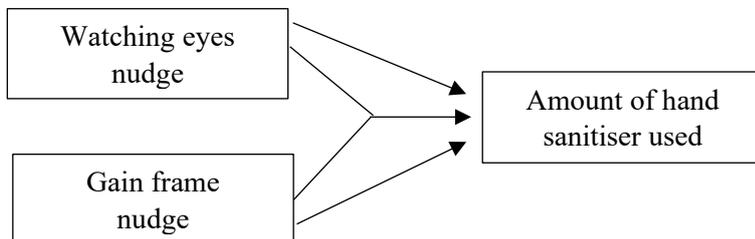
Location C	Intervention 2.4	Intervention 2.1	Intervention 2.2	Intervention 2.3
Location D	Intervention 2.4	Intervention 2.1	Intervention 2.2	Intervention 2.3
Location E	Intervention 2.3	Intervention 2.4	Intervention 2.1	Intervention 2.2
Location F	Intervention 2.3	Intervention 2.4	Intervention 2.1	Intervention 2.2
Location G	Intervention 2.2	Intervention 2.3	Intervention 2.4	Intervention 2.1
Location H	Intervention 2.2	Intervention 2.3	Intervention 2.4	Intervention 2.1

### 3.6 Analysis

The analysis consisted of a two-way ANOVA using SPSS software, to determine the relationship between the gain frame nudge, the watching eyes nudge, and the amount of hand sanitiser used. For the study, the dependent variable is the amount of hand sanitiser used and the independent variables are the gain frame nudge and the watching eyes nudge. The final model that will be tested with the analysis can be found in figure 8. No further models or analyses were created or performed.

**Figure 8**

*Theoretical model with independent and dependent variables*



## 4 Results

In total, 128 data points were collected over a period of four days. Over the total period of data collection, 239 grams of hand sanitiser was used, and the spread of this total in terms of location, day and intervention type can be found in table 3.

**Table 3**

*Total grams of hand sanitiser used per location, day and intervention during data collection*

Intervention (poster)			Location (bottle)			Day		
	Percentage	Grams used		Percentage	Grams used		Percentage of total	Grams used
2.1	26.8%	64	A	24.3%	58	1	21.3%	51
2.2	25.9%	62	B	2.9%	7	2	24.7%	59
2.3	20.9%	50	C	3.8%	9	3	24.7%	59
2.4	26.4%	63	D	1.3%	3	4	29.3%	70
			E	10.5%	25			
			F	45.5%	109			
			G	5.4%	13			
			H	6.3%	15			
Total	100%	239		100%	239		100%	239

To look at the effects of the watching eyes nudge and the gain frame nudge, as well as their possible interaction effect, a univariate analysis of variance was used. For all statistical tests, an alpha level of 0.05 was used. The ANOVA showed an insignificant model,  $F(3, 28) = .055, p = .983$ . The individual effects of the nudges and their interaction will be discussed further in this section. The parameter estimates of the ANOVA can also be found in table 4.

**Table 4***Parameter Estimates*

Dependent Variable: Hand sanitiser use

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	8,000	3,499	2,287	,030	,833	15,167
Watching eyes	-,250	4,948	-,051	,960	-10,385	9,885
Gain frame	-1,750	4,948	-,354	,726	-11,885	8,385
Watching eyes*Gain frame	1,875	6,997	,268	,791	-12,458	16,208

*4.1 Gain frame nudge*

In this study, interventions that had the gain frame nudge present accounted for approximately 48% of total hand sanitiser use. From the ANOVA, it can be concluded that there was a non-significant main effect of the gain frame nudge on hand sanitiser use,  $F(1, 28) = .125, p = .726$ . Therefore,  $H_1$  can be rejected with the results of this study.

*4.2 Watching eyes nudge*

According to this study, interventions that had the watching eyes nudge present accounted for approximately 52% of total hand sanitiser use. From the ANOVA, it can be concluded that there was a non-significant main effect of the watching eyes nudge on hand sanitiser use,  $F(1, 28) = .003, p = .960$ . Therefore,  $H_2$  can be rejected for this study.

*4.3 Interaction effect*

The interaction effect has been tested for its significance in an explorative manner, as no previous literature had researched this effect. In the study, only intervention 2.4 included both nudges and accounted for approximately 26% of total hand sanitiser use. The results of the ANOVA show an insignificant interaction effect of the gain frame and watching eyes nudge,  $F(1, 28) = .072, p = .791$ . Therefore, the results of this study cannot positively answer RQ<sub>2</sub>.

## 5 Discussion

In this chapter, results will be reviewed. In order to answer the research questions most effectively, the main effects and the interaction effect will be discussed first, after which the research questions and hypotheses will be discussed. Then, limitations of the study will be addressed, as well as recommendations. Lastly, conclusions of this study will be presented.

### 5.1 Main findings

Overall, only insignificant effects were found. Before addressing each effect separately, a possible explanation for the insignificance for all effects can be found. This study was done in a time where COVID-19 was less prevalent than before. COVID-19 has been known for more than 1.5 years, which means that there is overall less fear of the virus and thus less coherence to behavioural rules (Rijksoverheid, n.d.). More specifically, the baseline for using hand sanitiser in general is relatively low, compared to the start of the pandemic. This made it more difficult to properly measure the effect of the nudges, as the difference between the interventions is not very distinctive.

#### 5.1.1 Gain frame nudge

In light of the research question, a hypothesis was formed on the basis of existing literature:

*H<sub>1</sub>: The presence of a gain frame nudge will have a positive effect on performed hand hygiene; more hand sanitiser will be used when the gain frame poster is presented to the individual in comparison to the intervention where the gain frame nudge is absent.*

In the results section, it has been established that in the current study, there was no effect of a gain frame nudge on the use of hand sanitiser. In the interventions 2.3 and 2.4, the gain frame nudge was present in the form of the text ‘Kill COVID’. The choice for this specific text was derived from the focus group, which served as a pre-test. Overall, interventions that included this gain frame nudge were responsible for 113 grams of hand sanitiser, which equals 47.3% of the total amount of hand sanitiser used during data collection.

The insignificance of this negative main effect is unexpected, considering previously published literature and the focus group. However, a possible explanation for this effect might be that participants of this study have been subjected to too many of such statements in the past 1.5 years, since the pandemic started. Many people in the Netherlands have seen and experienced the campaigns from the government, and subsequently take statements such as ‘Kill COVID’ less seriously than if it was the first time that they would have encountered it (Rijksoverheid, n.d.).

Another explanation for the insignificant effect might lie in the choice of text on the interventions. Although ‘Kill COVID’ is a gain frame nudge, it may have been more effective to choose for a statement that explained what the direct effects would be of sanitising hands, as with a

behaviourally oriented nudge (Cadario & Chandon, 2020). Thus, a less ‘general’ statement, but one that is more focused on the positive effects of the expected behaviour, may have been a better choice for the interventions in this study. Despite this, the exact reason for the insignificant negative main effect is not known.

### 5.1.2 *Watching eyes nudge*

For the watching eyes nudge, the following hypothesis was created based on existing literature:

***H<sub>2</sub>***: *The presence of watching eyes will have a positive effect on performed hand hygiene; more hand sanitiser will be used when the watching eyes are presented to the individual in comparison to the intervention where watching eyes are not present.*

The results show that this is not the case; an insignificant negative main effect was found for the watching eyes nudge on the use of hand sanitiser. Based on previous literature and the focus group, this is an unexpected effect. During the study, watching eyes were present in intervention 2.2 and 2.4. These interventions accounted for the use of 115 grams of hand sanitiser, which is approximately 48% of all hand sanitiser used.

A possible reason for the insignificant effect of watching eyes in this study might be the design of the eyes. From the focus group, it was decided that strong looking eyes that were realistic would be most suitable for this study. However, it might be that the result of this focus group was not representative for the participants of this study. Another design may have led to more effective results.

Furthermore, previous studies have shown that watching eyes are mostly effective when they are applied to relatively quiet places. The locations used in this study seemed relatively quiet, but may have been too crowded to test the effect of watching eyes properly. This is in line with research done by Sparks and Barclay (2013), which shows that watching eyes work at the unconscious level. In the interventions proposed in this study, the nudge may have been too pronounced. Participants may not be influenced by the watching eyes because the interventions were not subtle enough.

### 5.2 *Interaction effect*

One intervention measured the interaction effect directly, namely intervention 2.4. This intervention alone accounted for 63 grams of hand sanitiser used, which equals approximately 26% of total hand sanitiser that was used. A second research question regarding the interaction of the gain frame nudge and the watching eyes nudge was posed:

**RQ<sub>2</sub>**: *Can an interaction effect be identified between a gain frame nudge and a watching eyes nudge, in the context of hand hygiene?*

From the results of this study, it can be concluded that there is no significant interaction effect between a gain frame nudge and a watching eyes nudge in the context of hand hygiene. However, in this model, the effect that was found, although insignificant, was positive. This question was of explorative nature and had no previous literature that could give insight into the expectations of the answer.

The insignificant effect might be explained by dissonance between image and text. According to Marsh and White (2003), text can be interpreted easier when visuals are present. However, the visuals presented in intervention 2.4 are not necessarily related to each other and might cause confusion when placed on the same page. Oppositely, this dissonance might cause an individual to notice the intervention more easily. The actual effects the interventions had on an individual were, however, not recorded in this study. Despite the insignificant effect of the interaction, it is possible that other studies might find significant effects for the interaction, possibly if they also find significant effects for the individual nudges.

### *5.3 Limitations*

This study has a number of limitations that should be addressed. First of all, the study is not representative for the entire Dutch population due to the specific group of participants. Because of the locations of the study, most participants were students. Therefore, conclusions cannot be drawn directly about other groups of the population. Furthermore, the eight locations within the facility appeared to be comparable, but turned out to be different in the amount of visitors they attracted. This was especially visible in location A and F, which were a women's changing room and a men's bathroom respectively. These two locations were closest to the entry and exit of the building.

A fourth limitation is the amount of data points. In total, 128 data points were recorded, but in order to make this study more reliable, more data points are preferred. Especially during the time in which the study took place, a higher margin of error would be preferred. In the current situation, a difference of 1 gram of hand sanitiser could show a lot of variation between measurements. More specifically, if the weighing scales were not exactly accurate, this could make a big difference.

A further limitation for this study was the location. During the study, it was possible that an individual passed multiple interventions during one visit of the facility. Furthermore, they could pass the same intervention more than once in one visit. This makes the data less reliable, as the effects of the interventions may become less strong if they are noticed more than once.

Lastly, limitations in the preliminary research should be discussed. The focus group was a qualitative research method, with participants from multiple areas. However, most participants were students from two different universities. This may have influenced the final intervention designs. Nevertheless, the interventions were used in an area with many students, which means that the designs were likely suited to this target group.

#### *5.4 Recommendations*

Despite the insignificance of the model created in this study, the nudges have proven to be effective in previous studies. Thus, for future research, it might be interesting to perform this study in other demographic groups and in other research contexts, to see whether the same or different results will be found. Furthermore, in this study, the reason why people refrain from using hand sanitiser was not researched. In order to most effectively present interventions that counteract that, these reasons should be studied. Consequently, that may lead to more effective results.

#### *5.5 Practical implications and future research*

From this study, we learn that the source of the insignificance of the effects should be further studied, considering that previous literature has showed positive significant effects for watching eyes and gain frame nudges. Furthermore, these nudges should be studied in a different context that is less dependent on the time in which the study is done. More specifically, the uncertainty that COVID-19 brings about makes it difficult to test the effectivity of the nudges. Individuals are less or more likely to use hand sanitiser depending on how prevalent the pandemic is at that moment, without the presence of any intervention. Therefore, for future research, a study towards these nudges should be conducted with a measure that is and will be consistent over time.

#### *5.6 Conclusion*

In this research, two research questions were studied regarding the effects of nudges on the use of hand sanitiser during the COVID-19 pandemic. The first conclusion to be drawn is that the presence of a gain frame nudge do not significantly increase the use of hand sanitiser. The second conclusion that can be drawn is that the presence of watching eyes do not significantly increase the use of hand sanitiser. Subsequently, the interaction effect of a gain frame nudge and a watching eyes nudge is not present in the same context. Because of these results, it can be concluded that individuals are not inclined to use more hand sanitiser if they are nudged to do so with the presence of a gain frame nudge, and/or a watching eyes nudge.

Aside from insignificant main effects in the model, no substantial differences in grams of hand sanitiser used were found between different interventions. This shows that the interventions presented in this study had no effects on the use of hand sanitiser.

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## Appendix A – focus group transcript

I: Yeah, I take the information that you gave and put it into my thesis. I hope it's working. Yes. So now for the official ethics, kind of part of this thing. Do you acknowledge that you're taking part voluntarily and that you will remain anonymous, and that nothing weird will happen to the data? I won't share it with anyone. That sort of thing. If you agree, then please nod again. Okay, thank you. So now for my thesis, I'm pretty excited to share it because I've been working on it for quite a while, I will also try to upload the presentation that I made. I have been working on. It's about COVID, and hand hygiene. And what I want to do is propose two interventions, so like a poster or something, and to see what works best to meet people like, to have people make use of hand disinfection materials as much as possible in public spaces. So what that basically means is that if I were to go to university, and we have those, like pumps there to clean your hands, I usually forget to use them. But say if there was a poster next to it that said, hey, it's really important that you use this, I might be using it. And so what I want to figure out today is what is the most effective poster or intervention for that? And yeah, I need your help with that. So I'm now going to try to share the uhm, thing. Oh, wait, you should be able to find it but I'll just do it like this. Okay. So I think you see this. The only disadvantage of this is that I don't see you anymore. So if you want to say something, just please, please unmute yourself. And then yeah, it should work. So yeah, I already told you about the aim. Are there any questions about the aim of the research? If not, I will just continue talking. If you do, then unmute. No, okay. Yeah, so the contents and the aims of this focus group is to evaluate posters, and images for their different elements. As you can see here, it's about the textual elements, the colours, the images, the overall message delivery, and the effectiveness of that delivery. So I will go through some posters that already exist. I put the text in English and in Dutch, so because I know that for some people, it's easier to read in your own language. It's about how you feel about them. So think about the text, the use of color, the intended message, images, illustrations, etc. Are there any questions about this before we start? No. Great. So this is the first one. Yeah, so if you look at this, what is the overall feeling you get from it? How about the colours? Do they fit with the sort of health related message that it is supposed to portray? How does that work? If anyone has anything to say, please unmute.

R1: I would say you is not a color that makes clear that you shouldn't should use it many red or something would make it more clear and more like compelling, you should do it, blue is a gajner color or something. I think the images are very clear, I think.

R2: Yeah, I agree. I think it rather looks like a suggestion. Like that's what you can do here. But like what do you have to do, like wearing a mask? Or indeed, disinfecting your hands?

I: Yeah. So do you think that brighter colours would have more of a sense of urgency then?

R1: I think colours like red or yellow and orange are colours to compel instead of, yeah, you should do this, but it's not necessary.

I: Okay. And what about the text for example? It says attention, protect yourself and others from getting sick, apparently it says Codiv instead of COVID, I did not see that before. Um, how does that work? Is that effective? Or does it look not very professional or very professional?

R3: I think it's effective. But I think it's in cooperation with the pictures is bit little, you don't see it. It's not like your eye doesn't go right to their eyes go to the attention. And then the blue is very calming, soft blue. is the only thing I really read is attention, and then I will walk past, I think.

R4: I think it looked like looks like a sign that is there for ages. So it doesn't attract my attention.

I: Yeah, okay. Like it would always be there.

R4: Like traffic signs.

R2: Yeah. Okay. Yeah. And I also think that it should maybe be more like in your face, because by now we have seen these posters, basically everywhere. And once we see them, you're like, Yeah, okay. I don't care. And maybe it should be really like in your face really big. And that would probably help more.

I: Yeah. Okay. Thanks. Uhm, I think we've covered this one. Let's move on to the next one. Which is this one? A very different style. Anyone wants to say something about it? Go ahead.

R1: I think this one is more clear because of the yellow. And you'll see, it's different than the other signs. So you would watch it earlier and you will see it.

I: Yeah. And what about the text? So 20 seconds that could save your life? It's almost as if, if you don't do it, you're, you're in the wrong.

R3: I think it's a better text and the previous one because you didn't you don't see this text for much. But it is the truth. And the older ones, I think, like said, we see a lot of those posters now. And so you kind of filter them out. So I think you need something new to grab the attention.

I: Yeah.

R4: A lot of text.

I: Yeah, true. But the biggest. So if you look at this poster, How far would you read? Because I personally would just read 20 seconds that could save your life. Do you read the rest as well?

R2: I think the hands immediately catch your eye. That's also the first thing I looked at. And then you maybe start to look at some of the texts. But I think if you're walking into the building, and you're basically just passing by, I think you would, indeed just read the 20 seconds part.

R4: First I read the British Safety Council and then the 20 seconds that could save your life. Because of the colours I think.

I: So I'm also curious about, especially from [R5], actually, I think you have a nice analysis on this. This text is more emotional rather than rational than the previous one was, how does that come across for you?

R5: I think if it's better, because also, like this is the kind of message that we want to give. And you said emotional but actually the first thing I saw was the British Safety Council. So what was it Ethos or Pathos? One of those elements of logic or logic the one of them that this connects to I think, and then immediately the emotional one after that. Yeah. It connects pretty well.

I: Yeah. Alright, thanks. Let's continue. I think it has, if anyone has anything else to say about it. This one another different, how do you call it?

R1: I think it's a bit too much. Around the sign, there's a lot of things to see and you see text and you see the hands and you see too much. So I would walk past it and not read anything.

R2: Yeah, yeah, I totally agree. I think I would just look at and just totally ignore it and don't do anything with it.

R3: I also think that colours are like black and white and then use a little bit of color with the hands. It's pretty soft colours. So I don't even think I will look at this, I will just walk past.

I: And what about the little 20 second thing? Does that influence you at all?

R3: Yeah, you do it with like the pump so you what I used to do is I rub my hands until they are dry because I don't like the feeling of it. And 20 seconds more like if you wash your hands with water and soap.

R4: Wat do you call it, it's like a keurmerk.

I: What do you mean with it?

R4: The 20 second sign, it looks like, ..

I: Like a logo or something.

R3: Yes, and also the text, I don't want all the germs away from my hands.

I: Yeah, so I think overall, we might conclude that this one is too busy and not very effective than right. Yeah, I agree. But if we isolate the illustration, so only the hands, for example, and you were to enlarge that, and have the large text of keep the germs away, wash your hands? How would that feel?

R5: I think the hands are also kind of confusing, actually. Because it's not a very like a classic image of sanitizing your hands. I think that yeah, I think the small dots like there's one of them, that appears to be a germ and the rest are like bubbles. So it's visually interesting, but not enough to catch my attention, I guess. Or like also to make not make the message very clear.

I: Yeah. So for the Quick, quick, thoughtless thinking this wouldn't work to help you direct towards Oh, I need to wash my hands.

R4: I don't think so.

I: All right. Thank you. Next,

R3: I shouldn't use a blue color in blue is more like a calming color. And for COVID. They use a lot of blue. But I think if you need a new poster, I won't use the colours they use now because it goes like over over a year. So people start to ignore the message, I think.

R1: Yeah, see, they use blue text on the blue backgrounds. I don't think that's the smartest idea because it does doesn't stand out.

R3: And colour blind people. I think they can't read it.

I: Oh, wow. I didn't even think of it. No. What about the the actual text like what it says?

R1: I think it's similar to most text. It's the basic text and everyone knows it. And most people ignore it. Yeah.

I: Yeah. So what I found interesting about this one is that it says, For your safety and the safety of

others. So with this poster, they're also like, for example, with this one, it says save your life. Here it was just in general. And then your they don't really say anything about it, whether it's about you or others, but here they really specify for you and others. Does that give an additional meaning in your quick thought process?

R2: Yeah, I think if you really look at it for a longer period of time, then yeah, sure. But I don't think that if you're in a building and you see this poster that I didn't even notice it until you said it. So I don't think really makes a difference here on this poster. But I guess on other posters, yeah, it could make a difference.

R1: You mostly read wash your hands and the other text is not you don't really read it.

I: Okay. Anyone else anything new to add? or similar? More blue. Same image. It's also from the Australian Government. So I think this is one of the posters that they provided that people could use in their organization and such, as it says, your logo here at the bottom,

R2: I think it's better than the other one that was really crowded. But I still think that it's not really, doesn't really get your attention. I do think maybe in your organization, your boss will probably tell you, tell you something about it, and then you would notice it, but I don't think it's, it adds anything more if it's designed this way.

R1: Yeah. Yeah, I agree. A lot of blue again, and an image that is not that clear. The text is very small. So a lot of small things that doesn't make it stand out. Not, I wouldn't, wouldn't notice it.

I: So we really need something bright and attention getting.

R2: Yeah, just so you know, I think your dad is out of the conference.

I: Thanks. I think so too. But yeah, we lost him, haha. Do you still see the PowerPoint though? Oh, okay. I'll quickly go check and then do the PowerPoint. Wow. Okay. share screen again. Yes. Okay, so, conclusion of this one. Still a lot of blue. Not a clear image doesn't stand out. Right.

R5: Yep.

I: Okay. [R4], do you want to add anything else? Oh, *ik hoor je niet. Je bent gemute.*

R1: *De presentatie is ook weer weg.*

I: *Ja klopt. Ik weet niet of hij mij wel hoort.* Okay, whatever. Next, very interesting, in my opinion, that let's hear it.

R1: *Je hebt de presentatie nog niet aan staan.*

I: Technical difficulties today. There we are.

R1: I think this one is better because they asked a question. So that helps. And it's another color hands. It's different.

I: Anyone else want to respond?

R3: I agree. I think it's more attention grabbing. It also reminds me of something and don't know what's so that's annoying.

I: For me, it reminds me of when I was in primary school and we would make those painting things with your hands.

R2: Yeah, I also think so it kind of reminds me of, I don't know, some kind of event for kids or so I do think it's way more attention getting. So I would say, if you have like another hand image, it would basically be really good.

R3: You know what? Kika. Kika also always just worked reminds me of.

R5: So the text below the hands actually doesn't quite bring the message home. I feel like, at least not in a very attractive way. The first time is really like catches your attention. And then it goes to prevent COVID instead of like, focusing more on the hand thing. And like the rest of the text also, kind of long.

I: Yeah. So how about the if you were to see this, would it come across as professional or effective? Or do you think it fits in a public place, that isn't a kindergarten?

R1: Maybe pink isn't really professional, I think, maybe if you would make it another color, and maybe the hands a little bit different. It would look professional, but now maybe it isn't.

R4: I wouldn't read it. It's too, uhm, the colors don't invite me to read it.

I: A bit too in your face.

R4: Yeah, it's just like little like I did the the freedom movement in in South Africa. Did that's what it looks like. Yeah. Yeah. And, and the colors don't invite me to read this.

I: Okay. Shall I continue? I don't think anyone. Yeah. Okay. So here, I added a translation. It says, care for distance of each other. But you kind of speak Dutch. So maybe you get it. Very simple, but I'm interested.

R3: I think maybe it's a good post before distancing my notes for disinfecting your hands.

I: Yeah. Yeah, that's also not the point of what this poster was. I was, or I am pretty curious about what do you think of the style of this very simplistic. Just text, one color or two?

R5: I think it looks very professional.

R2: Yeah, yeah. I also think, yeah, I also think it looks very clean, very professional. But I don't know if it would catch my eye.

I: Yeah.

R1: Yeah think because they striked through *afstand*. It's a bit confusing, maybe?

I: Yeah, I'm not sure. I think the point of this poster is actually to make sure that people don't forget that they also have to, like, be emotionally involved with each other instead of just keeping instead of just keeping distance. So this one is not really towards, like, promoting the what is the word for *maatregelen*, again, like rules, they're set in place. Yeah, regulations. But just the style. It does come across as professional as you said. So that could be interesting.

R4: And it makes me think ,because of the *afstand*. Okay.

R2: I think the last poster also looks a bit like, I don't know, a poster for a party in an upcoming election that's trying to promote their own party and politics.

I: Yeah, I see what you mean. Yeah, they're always tried to be simplistic and stuff. Yeah. Okay. Next. I think this is one of the last ones and then we move into a new segment.

R1: I think this is the same as we see everywhere. It's just extra features and everyone ignores it. You know what it says, and it's not special anymore. And it's [inaudible].

R2: Yeah. Yeah, I totally agree.

I: So there, it's, it's just become same old, same old and thus not effective enough. Okay. Anything else to add? Anyone? About the text maybe? The *samen*, we see that a lot in the Netherlands, to do things together.

R2: Yeah, I think this would maybe be good, like in the beginning of the pandemic, when, for example, in your own company, your boss, or I don't know, the health inspector, however, that's called, basically presents the poster and basically walks you through the poster. But I think if it's just hanging in the hallway, you don't really read the text.

I: Okay. Good to know.

R4: It's like a poster that hangs in our classrooms for in case of fire. And nobody knows what to do because nobody reads it.

I: Yeah. Okay, fair enough. I think that's it then, oh the color, by the way they use green here is that. I mean, I personally associate the colours like blue and green. I associate them with health and stuff, but not really with urgency in and in a poster like this. Do you think it's more important to focus on health on urgency?

R3: I think this poster is more on health because it has lots of different messages of different regulations you need to keep where it's not really for. Okay, so I see this poster, I'm going to wash my hands now or not. Maybe this is less urgency and more overall.

I: Do you think it should be more urgent for what I will be using it for?

R1: Well, I think the bright colours on the small pictures are making it more urgent. But they are too small, so you don't really look at them. But I think they use bright colours. They're your red stripes, that yellow, and that kind of things?

I: Yep. Okay. Good. Um, so, then I would like to touch on some textual elements I have read about so called gain frame, nudge, which is where you would tell people well, if, if you would do this, then we as a collective group would gain this and this and this, and that appears to work. So now I'm interested if you read the first 1, 90 percent of our visitors wash their hands upon entrance, the Dutch translations at the bottom, by the way. Does that make you more likely to do it? If you see that on a poster, I mean, what does it make you, how does it make you feel?

R2: That's just feels a bit like corporate bullshit. Like we had the best 90% of our visitors wash their hands. Not really telling me to wash my hands.

I: Okay.

R1: Yeah, the text itself doesn't convince me, but if you see that 90% of the people are washing their hands. You will probably wash your hands too. But if you see the text, I would think that's bullshit.

I: Okay. Interesting. And the second one by washing your hands, you're reducing chances of infection by 90%.

R4: Then I want proof.

I: You're just too intelligent for a poster like this, haha.

R4: I know. But I, I think why 90%, why 91? I don't know. It's not for me that I wash my hands then.

I: Okay. Any response? Curious if everyone feels the same way?

R3: Like I agree with it. It's more like, it feels like 90% this one? Oh, that's a nice number. It doesn't say if by washing your hands you reduce the chances of infecting others by 90%, and then like bron.

I: If I would say research has shown that ... Does it make it more, like, real?

R3: Depends on what kind of research? Because I think if you say that the government has researched it, nobody's gonna believe you did this moment. Because they say, a lot of things. But if you like, maybe an well-known company that isn't influenced by the government or profits with COVID-19, maybe, then also people need to know that company.

I: But then again, on a poster that you would walk past, without really make a difference?

R3: No.

R5: I would say, just looking at this sentence itself, and just the way it is, I think it would be better to rephrase it more like the first sentence with the 90% in the beginning of the sentence. So then that's more obvious. And that's Yeah. It's more clear. Because we have a sentence if it started by washing your hands, and it's not as interesting, I would say.

R2: Yeah, I think in general, about 90%, I think would be better, also more relatable, if you would exchange it with, I don't know, nine out of 10 people or so. Because I feel like if you read 90%, you're like, okay, but 9 out of 10 people feels a bit more relatable, and a bit more convincing. I think.

I: That's a good point. So for the third sentence, I made a small difference. Instead of germs of infection, I put chances of infecting other people, does that make a difference in how it is perceived? If we were also, by the way to take into account, what [R2] just said about like nine out of 10 people and put that at the start of a sentence or something.

R3: I think for me, this works better. I don't know, if I actually gonna read the whole sentence but. I am like the person who thinks, if I get COVID, and it's not that bad, I don't really care but if I gave it to my parents or grandparents I will feel really bad. So I, I do it more for other people than for myself.

R1: Yeah, I agree. For me the same. Yeah.

I: Yeah, I think that, that is for our age group, a very common thing.

R5: And also, I feel like the second statement is more like, sort of, like, advertising kind of thing, where you're like, oh, if you do this, then you get this sort of result. When the third one is more, like, if you're gonna if you're not gonna do or if you're gonna do this, then you're gonna influence this consequence. So yeah, that's why it has more impact, I think.

Unknown 33:13

Yeah. Okay. I see what you mean. Yeah. And then the final, the fourth one is by not washing your hands, you increase the chances by I put five, but just a number. And the most important thing is that the not doing it, and those making something worse, possibly.

R3: I do think with this sentence you need to make not very visible, because if I walked by there is a very big chance I read over the not, and I think why is it increased if I wash my hands?

R1: Yes, for me the same, you have to really read it to get it, you can just read it really fast. Because you forget the word not.

I: Then I have a final like, thing I want to touch on, which is called the watching eyes effect. I will quickly explain what it is. It's a type of nudge and a nudge is something that you might have seen or heard of. It's basically where you would provide someone with something that steers them their behaviour in a certain direction. Now that's very vague, I know. So for example, at Schiphol, the airports, they had those urinals for men, and there was a lot of spillage apparently. And so what they did, they put a fly in the urinal, and that made people or people or men probably aim better when they went to the urinal, and there was less spillage. And now that is a very good example of a nudge because it's like someone is influenced without them knowing probably. And it's very effective. And there are different variations of that. But I specifically want to focus on the watching eyes nudge or watching eyes effect. It's another way you may have or may not have seen before. If you go to a public place, and they want you to do something, then sometimes you see a picture of eyes. And research has shown that just the depiction of eyes can help in steering people's behaviour already because they feel watched. And now I'm going to go through a couple that I have. And I'm curious to see what style would be the most effective. But first, I'm interested in knowing if anyone has ever encountered a watching eyes before. If there's no response, I assume it's no.

R5: I'm just trying to remember I think it was in, like to warn people that there's a camera around. I see some eyes.

I: Yeah, that's a common one. And how did that make you feel? Oh, crap.

R5: How it was okay, because I was like, it's sometimes it's good to know that there's like a camera around. So when you're not feeling safe, then yeah, you feel a bit more safe. But yeah, I think that could also have a lot to do with my own background. And I'm used to being sometimes in unsafe situations. So that's why that's more prominent in my mind, then. privacy, I guess.

I: Yeah. Okay. Well you already saw the first one, which is this one, very bright and animated sort of like a cartoon. How does that make you feel? Or what do you think about it?

R2: Yeah. Yeah, seeing it really feels like some poster of activists that I don't know what to advocate for less cameras surveillance really feels like the world is gonna end and we are all being watched. And everything is bad.

I: I see your point Anyone want to respond?

R2: Yeah, I think doesn't look professional. It just looks with the yellow and blue and the eyes. Yeah, I don't know. Not professional. Not something you would put in a mall or something? For cameras I don't know where to use this.

R5: Yeah, and the colors especially just make me think of immediately SpongeBob SquarePants. Yeah.

I: Same.

R4: I had this with another movie with this. Little animals, yellow

R1: Minions!

R4: Yes, that one! Exactly the same colors.

I: Haha, yeah. Okay, let's continue to the next one.

R3: Yeah this whole guy looks angry or like predator so this will make me feel unsafer if I'm being watched. Okay, he feels gross.

R1: It scares me a bit.

I: But will it make you wash your hands?

R3: I wouldn't wash my hands. I would walk the other way.

Unknown 39:07

If it's like a drill sergeant standing near you and just screaming at you wash your hands. You're just intimidated by it? Yeah.

I: Do you think there's more intimidation anyway? Because they're actual human eyes rather than abstract ones.

R3: I think it's more intimidating because human eyes, but I think I will put you for poster that are less intimidating. Intimidating eyes. Yeah. You don't need like really friendly eyes but these kinds of like serial killer.

R4: I think it really is Dexter.

I: Yeah. Okay. Is this better?

R1: Yeah, this better. He looks kind of friendly and just watching. Yeah.

R5: I don't know if it's just me but I find it very strange to see actual human eyes in a poster like this.

R3: I don't think it's strange because also in magazines and stuff you have eyes and normally if you have eyes watching you or eyes watching the subject they want you to read. But this one looks a bit airbrushed or something, a bit weird.

I: It might be a Sim, actually. So for my research I am planning to do 2 interventions where one is a poster and one is a watching eye, and I want to introduce them both separately but also together, on two different pages or something. That might be good background information, they will be presented separately, the watching eyes. Now for the next one, I think this was actually used. This is a mock up

of it, but it was actually used for parking spaces and stuff. And the text means, we are, what's the translation, ...

R3: If it is for parking spaces then especially for disabled people it would work because this is an older man, so you don't put your car in that space. Just park safe, maybe that was the idea.

I: This was I think with a parking space thing where you have to pay, you know, so that you really will pay. How effective is it in that?

R1: I mostly think it looks a bit weird. If you see a sign like that and you see eyes I would think, what is this? Why are there eyes? I would be confused.

R3: maybe it's also a little weird because his head is looking down but his eyes are looking up. It's not looking straight.

R4: It works on me, it's quite intimidating.

I: Do you think the text is a crucial element to it?

R4: Yeah, you know why the eyes are there.

I: Yeah, fair. This might be the one that you saw, [R5].

R5: Yeah, it's pretty similar.

I: Well, [R2] will know the translation, but it's camera surveillance basically. So this is very abstract and just one eye, does that do anything?

R3: I think this is the universal sign for 'we have cameras around', I think you also see this on the train. I think it's more that you know there are cameras around, the eye gets your attention and you already know there are cameras. You don't really need the text.

I: So this sort of symbol has the association for you with cameras.

R3: Yeah, I think so. If I see this I think cameras are around. Because it's also one eye I think it's more like a camera, like a camera lens.

R4: I think more like a logo. It didn't strike me as an eye at first sight.

I: Did anyone else want to say something?

R2: Yeah I think the eye, it works, because you get some information and you inform people that there is video surveillance here. But in other cases I don't think it would really work to get them to wash their hands or pay their parking fees.

I: Okay, yeah. So this is the last one. It's female.

R3: I think it's still strong but a lot friendlier. Much nicer, but still gets the message across.

I: Yes, and how is that for you [R2 and R4]?

R2: Well, this kind of reminds me of going to the doctor and brushing your teeth or whatever. I would find this weird in a public space. I don't know why but it really reminds me of going to the doctor.

R4: I think it's alright. This one is more natural than the airbrushed thing. I believe the message more now. By these eyes.

I: More human?

R4: Yeah, more convincing for me.

I: Well, I quickly want to recap so for the watching eyes what works. We mostly had male eyes but a few female ones, does that make a difference for you? How do you feel about that?

R1: It doesn't really make a difference for me.

R3: Female eyes work better for me, a little bit softer.

I: Okay. And then there were some abstract pictures of eyes, and then more real ones. What would be more convincing to you?

R4: More concrete ones.

R2: I also think concrete eyes feel strange but they get more of your attention so you would be more likely to do it.

R1: I agree with that.

I: That's interesting. Lastly, the facial expression: what would make you most likely to do something? In this case, washing your hands at the entrance.

R4: I think it's the seriousness in the eyes. There were examples of scary, too friendly, but I like the eyes of the female. It was serious, but not scary. It brings the message they want you to understand.

I: Okay, that's good. Does anyone have some final words?

R1: Too scary only scares people away and too friendly does not make people do anything. So I think a strong expression is best, I agree with that.

I: Alright, thank you very much everyone. If anyone is interested in the outcomes of this research, just send me a message because it's not secret at all. Thanks again and have a good day!

**Appendix B – Excel sheet of one day of data collection**

Datum	5-okt	dinsdag							
Dag	1								
	locatie	poster	10 uur	12 uur	2 uur	4 uur	6 uur	verbruik	
	A	1	400	398	396	390	386	14	
	B	1	392	391	390	387	389	3	
	C	4	397	395	395	393	393	4	
	D	4	396	396	393	395	395	1	
	E	3	396	396	390	388	385	11	
	F	3	397	398	387	385	384	13	
	G	2	395	395	392	392	392	3	
	H	2	398	397	396	396	396	2	

Refill 12:00	Refill 14:00	Refill 16:00
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

12.00	12.01	14.00	14.01	16.00	16.01
398	398	396	396	390	390
391	391	390	390	387	387
395	395	395	395	393	393
396	396	393	393	393	393
396	396	390	390	388	388
398	398	387	387	385	385
395	395	392	392	392	392
397	397	396	396	396	396

Location	Poster	Which poster is that?
Location A = kk 1	1	NoKillNoEyes
Location B = kk 3	1	NoKillNoEyes
Location C = kk 6	4	YesKillYesEyes
Location D = kk 7	4	YesKillYesEyes
Location E = fitness ruimte	3	YesKillNoEyes
Location F = wc man	3	YesKillNoEyes
Location G = wc vrouw	2	NoKillYesEyes
Location H = KDH	2	NoKillYesEyes