Investigating Dutch Adolescent Citizen's Compliance with the 1,5-meter Policy in Small Social Settings

Anne Julliët Vlutters

University of Twente

07-07-2021

Abstract

Since the beginning of 2020, COVID-19 has become a threat to our safety on many aspects of our lives. Governments needed to set policies to overcome this and increase the safety of their citizens. Compliance with the policies plays an important role in decreasing the threat. It was found that citizens aged 18-24 comply the least with the 1,5-meter policy in small social settings in The Netherlands. Persuasive communication can be used as a tool to increase compliance rates. It was therefore investigated if a particular persuasive communication strategy could be used to increase the compliance among this group for this setting. Two posters were made using fear appeal. One of the two posters contained an additional strategy, namely 'acknowledging resistance', to lower the reactance towards change that might be experienced in the recipients of fear appeal. It was expected that the poster with the combination of strategies would increase the intention to comply and improve the attitude towards the policy. A control group, who were not presented with a poster, was also added to check if the posters had an effect at all. This made a total of three conditions: fear appeal condition, combination condition (with fear appeal and 'acknowledging resistance'), and control condition. The manipulation check indicated that the two posters did not significantly differ from the control group, meaning that manipulation did not have the intended effect. Statistical analysis showed there were no significant differences in attitude and intention to comply and between the three conditions. This contradicts current findings of the effectiveness of fear appeals. This strategy might not be the most effective to increase compliance of Dutch adolescent citizens with the 1.5-meter policy in small social settings as the manipulation did not have an effect. It is therefore important that the effect of other persuasive communication will be investigated, as a high compliance rate is beneficial for the safety of the citizens during the pandemic.

Investigating Dutch Adolescent Citizen's Compliance with the 1,5-meter Policy in Small Social Settings

Since the beginning of 2020, COVID-19 has come to play a significant part in the lives of people worldwide. COVID-19 is a new infectious disease caused by the SARS-CoV-2 virus that causes mild to moderate respiratory illness in humans (World Health Organization, 2021). The disease has caused millions of citizens worldwide to feel ill, with some cases leading up to hospital admissions or even death (Sauer, 2021). It can be particularly dangerous for the elderly or people with underlying medical illness, as the virus can be most harmful to their health (World Health Organization, 2021). What makes this disease so dangerous is that COVID-19 is easily spread from person to person. When an infected person coughs or sneezes, droplets of saliva are released into the air, which can infect others that are within 1,5 meters of distance (Centers for Disease Control and Prevention, 2020; Sauer, 2021). This had led to many people getting infected worldwide, making it a pandemic.

As COVID-19 is spread all over the world, it is considered as a crisis that threatens the safety of all members of society. This situation is, however, not only affecting health, but also other parts of life. Societies are incapable to function the way they normally would, since many countries went into a lockdown to reduce the spread of the disease (Dayton & Berhardsdottir, 2009). Consequently, economies are slowed down in growth, which generally means that there is less wealth and fewer job opportunities (Jones, Palumbo, & Brown, 2021; Haleem & Javaid, 2020). Travelling from one country to another is restricted, which complicates the global trade market (Haleem & Javaid, 2020). Furthermore, citizen's social life is influenced negatively because many social events are cancelled due to the lockdown as there is a probability to get infected when meeting with others (Haleem & Javaid, 2020). Mental health and well-being are also negatively impacted by the pandemic since many people experience increased symptoms of depression and anxiety (Panchai, Kamal, Cox, & Garfield, 2021). These examples show that the lockdown has a substantial influence on the life of citizens.

The lockdown is defined by policies implemented by governments, who had to act quickly and accordingly to the crisis situation that the pandemic causes. To illustrate, the main implemented measures are to stay hygienic, for example by washing hands thoroughly, to keep 1,5-meters distance from other persons, and to

stay home when COVID-19 symptoms are experienced (Government of the Netherlands, n.d.). Compliance with government policies plays a crucial role in decreasing infections. When the rules implemented by the government are not complied with, citizens endanger themselves as well as others, as the virus can transmit itself faster when the rules are not adhered to (West, Michie, Rubin, & Amlôt, 2020). This means that high compliance rates strengthen the effects of the policies, which can cause the threat to be reduced.

Governments communicate the information on the virus and these policies via press conferences, social media, television, and posters (Rijksoverheid, n.d.). To try and achieve compliance with policies in a crisis, governments needed to bring across a persuasive narrative to inform their citizens about the situation and how it is expected to act (Boin, ‘t Hart, Stern, & Sundelius, 2016). For a message to be followed in the first place the source needs to be credible, and the message itself needs to be understandable and taking the reality of the citizens into account (Leiss, 1996). Citizens need to trust the source, understand the message, and see that it applies to them before they decide to take action (Glik, 2007). Strong crisis communication can lead the public to understand the crisis situation, which likely leads to building support for the implemented policies (Boin, ‘t Hart, Stern, & Sundelius, 2016). If the communication is perceived as ambiguous, invalid, and not urgent compliance rates will decrease (Glik, 2007). Citizens can actively choose themselves whether they will adjust their behaviour when the government asks them to do so and comply with their rules, which makes it very important that their communication is good (Blackwell, 1992; Cooper, 2016).

The Dutch government also needs compliance with the implemented policies to overcome the crisis caused by the pandemic. The threat is serious in The Netherlands, as 1472674 have become ill and 17093 have died as a consequence of the virus (RIVM, 2021). The RIVM (2020b) has found that the Dutch youth aged 18 to 24 years old complies the least with these policies compared to other age groups. Studies from other countries, like Switzerland and America, confirm these findings (Nivette et al., 2020; Chan, 2021). The policies that are the least complied to are the ones that restrict social interaction, as this is an important aspect in the lives of this age group, like the 1,5-meter policy (Nivette et al., 2020). Two in five of the adolescents declared that they could keep their distance or at least try to do so, but it is dependent on the situation whether they actually do it or not (RIVM,

2020a). When visiting family or friends in private areas, 6 out of 10 acknowledged that they do not keep the 1,5 meters, as they trust their close ones only to come to visit if they are perfectly healthy (RIVM, 2020a).

Taken together, the group in The Netherlands that complies the least with the policies are adolescents aged 18 to 24 (Nivette et al., 2020; Chan, 2021; RIVM, 2020b). Especially in small social settings, compliance rates are low for this age group (RIVM, 2020a). High compliance rates are, however, needed in these settings when trying to reduce the threat caused by the pandemic and strong communication can be a tool to achieve higher compliance rates (Blackwell, 1992; Cooper, 2016; Boin, 't Hart, Stern, & Sundelius, 2016). This leads to the following question: 'What is the effect of persuasive communication strategies on compliance with the 1,5-meter policy in small social settings of Dutch citizens aged 18 to 24?'

Theoretical framework

Whether people engage with protective behaviour, such as complying with the policies to decrease the threat of COVID-19, can be explained by the protection motivation theory, amongst other theories. This theory clarifies the cognitive processes that mediate behaviour when someone is facing a threatening situation (Rogers, 1975). As can be seen in Figure 1 below, the intention to perform a protective behaviour in a crisis situation is influenced by risk appraisal and by coping appraisal (Van Bavel, Rodriguez-Priego, Villa, & Briggs, 2019). Risk appraisal consists of the severity and vulnerability towards the risk. The severity refers to the degree of harm that the risk can bring upon a person (Lippke & Plotnikoff, 2009). The more severe the risk, the higher the motivation to perform protective behaviours (Rogers, 1975). Vulnerability, on the other hand, refers to the likelihood of a person to be harmed by the situation. The more vulnerable the person is to the risk, the more likely they are to change and maintain their behaviour to protect themselves (Lippke & Plotnikoff, 2009). The coping appraisal consists of three elements. The first is self-efficacy, which is defined as the degree of confidence a person has in performing a certain behaviour (Lippke & Plotnikoff, 2009). Next is response-efficacy, which explains that a person needs to be convinced that the protective behaviour leads to a desired result (Lippke & Plotnikoff, 2009). The third element is response costs, which refers to the weighting of the costs and benefits the protective

behaviour has (Lippke & Plotnikoff, 2009). Taken together, when both risk appraisal and coping appraisal are high, a person has a higher intention to perform protective behaviours (Rogers, 1975).

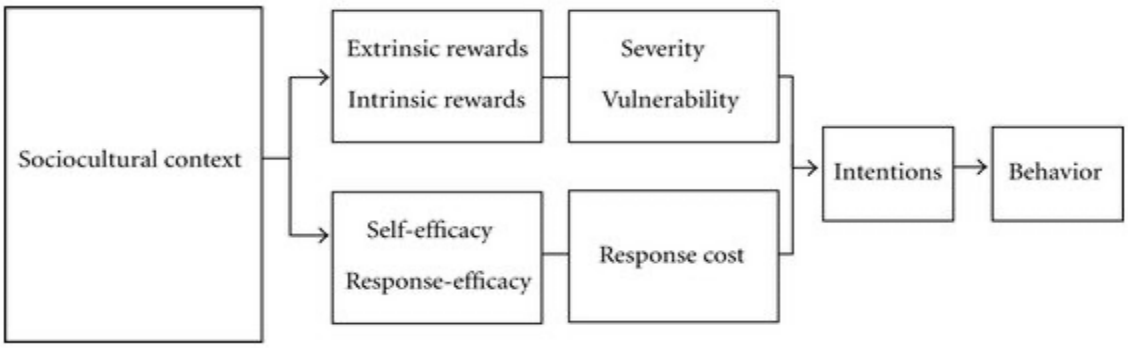

Figure 1. Protection motivation theory. From 'Evaluation of three adolescent sexual health programs in Ha Noi and Khanh Hoa Province, Vietnam' by Pham, V., Nguyen, H., Tho, L. H., Minh, T. T., Lerdboon, P., Riel, R., ... & Kaljee, L. M., 2012, AIDS research and treatment, *4*.

If we apply this model to the current topic, it can be seen that the appraisal of risk of the Dutch youth with regards to COVID-19 is low. The majority of the Dutch youngsters estimate that it is unlikely or neutral that they get infected with the virus. 14,8% thought it is likely and only 2,2% thought it is very likely to get infected (RIVM, 2020b). They estimate the virus to be close and that it spreads fast, but the perceived personal threat is still low nonetheless (RIVM, 2020b). This shows that Dutch adolescents do not perceive themselves to be vulnerable to the virus. Moreover, the severity of which the symptoms of the illness are experienced is low for adolescents, which also might explain why they perceive a smaller risk (Franzen & Wöhner, 2021; Wilson et al., 2020). 44% do not even mind if they would get infected (RIVM, 2020a). Risk-perception is an important factor in the choice to comply with the policies or not, as people are less likely to choose to follow the rules when they perceive the risk to be low (Nivette et al., 2020). The sense of vulnerability and severity determines whether people are likely to intend to engage in protective behaviours or not, which is similar to what the protection motivation theory predicts. Thus, Dutch citizens aged 18-24 are less likely to comply with the 1,5-meter policy in

small social settings, because they do not perceive the virus as severe, and they do not see themselves as vulnerable.

Furthermore, the Dutch adolescents found it difficult to cope with the COVID-19 measures. They especially have a lack of self-efficacy. Citizens perceive themselves as not able to adequately follow the rules in risk situations (Roma et al., 2020; Yıldırım & Güler, 2020a). The RIVM (2020b) has found that 57% of the interviewed Dutch youth thinks it is hard to follow the rule of 1,5-meter distance. The threat in risk situations can be reduced when citizens have high self-efficacy, as those who perceive themselves as able to follow the rules will do so (Roma et al., 2020). As for response efficacy, 69% of the young adults supports the 1,5-meter rule (RIVM, 2020a). This declines to 51% if the measures will take more than 6 weeks and even further declines to 31% if this would take up more than half a year (RIVM, 2020a). They state that they are not convinced that performing the protective behaviour will lead to the desired outcome of preventing COVID-19 from spreading. Concluding, Dutch adolescents do not have a high sense of self-efficacy and response-efficacy towards the 1,5-meter policy. This explains why they do not intend to engage in protective behaviours, like complying with this policy, as the protection motivation theory demonstrates.

From the previously noted findings can be derived that the risk appraisal and coping appraisal of the Dutch adolescents with regards to the 1,5-meter policies in small social settings has to change in order for them to have a higher intention to start performing the recommended behaviour of complying. Persuasive communication strategies can be used to achieve this. A strategy that can be used to increase the number of Dutch adolescent citizens that intend to comply with the 1,5-meter policy is small social settings is fear appeal. This communication strategy is derived from the protection motivation theory. It aims to influence the fear appraisal by evoking fear in the recipient of the message (Tunner, Day, & Crask, 1989). Only evoking fear, however, appeared not to be sufficient, which is why statements on coping appraisal also had to be added (Tunner, Day, & Crask, 1989). Thus, fear appeals influence both the risk appraisal and the coping appraisal, which were proposed by the protection motivation theory, to make a person have a higher intention to perform protective behaviours.

To make a fear appeal effective, and not counterproductive, Tannenbaum et al. (2015) have made several recommendations. First of all, fear should be evoked, as a higher appraisal of fear increases the intention to comply. Furthermore, fear appeals are more effective when an efficacy statement is added that informs the audience which behaviour is recommended to cope with the crisis situation and that reassures them of their capability to perform this behaviour, thus influencing the coping appraisal (Tannenbaum et al., 2015). What makes fear appeals more effective is stressing the vulnerability and severity to increase the risk-perception of the receiver of the message, according to Tannenbaum et al. (2015). The persuasive messages should imply that the viewer is at personal risk for negative consequences when they do not perform the desired behaviour, which improves attitudes, intention and therefore behaviour (Tannenbaum et al., 2015).

However, when a person is being persuaded by the use of fear appeals feelings of resistance can emerge (Knowles & Riner, 2011). Resistances are a key element in persuading citizens, as these resistances could be a reason that change is inhibited (Knowles & Riner, 2011). When recipients of a persuasive message feel resistant towards the change they have to make, the likelihood that they will do so is smaller. Fear appeals are known to cause a particular feeling of resistance in the recipient of the message, namely reactance (Shen & Coles, 2015). This is the negative feeling that emerges when another person limits the number of choices a person has, as their freedom of choice is reduced (Knowles & Riner, 2011). The government has set policies that the citizens have to comply with, and citizens can therefore get the feeling that their freedom of choice is limited. When the recipient experiences reactance towards the messages in the fear appeal on coping and risk appraisal, the effect on intention can fail or even be counterproductive (Shen and Coles, 2015). This indicates that reactance mediates the effect of the fear appeal with regards to coping and risk appraisal and the intention to perform the protective behaviour. For this reason, reactance can be seen in Figure 2 as a mediator.

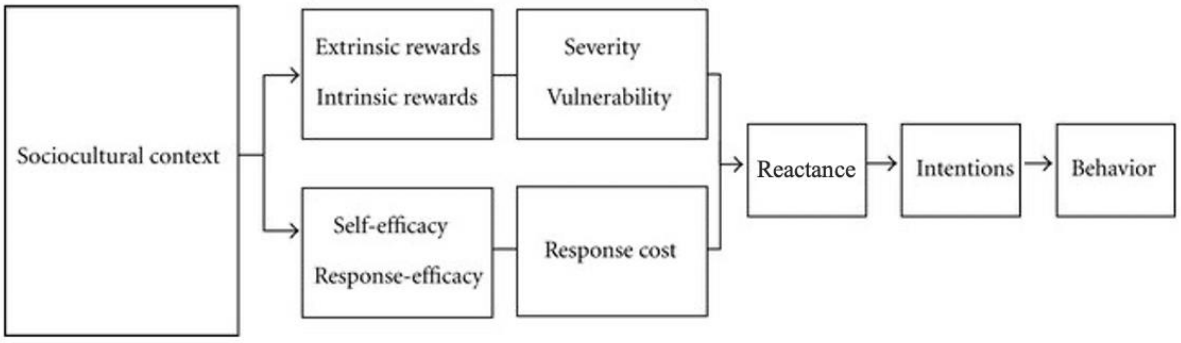

Figure 2. Protection motivation theory with reactance as mediator. Adapted from 'Evaluation of three adolescent sexual health programs in Ha Noi and Khanh Hoa Province, Vietnam' by Pham, V., Nguyen, H.,

To overcome reactance, and therefore improving the intention to engage in protective behaviours, omega approaches to persuasion can be used. These are approaches to behaviour change that aim to decrease the less appealing characteristics that come with the alternative choice and to take away the resistance towards the change (Knowles & Riner, 2011). A strategy that is frequently used in omega approaches to reduce reactance is 'acknowledging resistance' (Knowles & Riner, 2011). Acknowledging, and therefore validating the recipient's feelings of reactance, seems to lower these feelings, according to Knowles and Riner (2011). The request is not altered, and no more incentives are added, yet the acknowledgement shows empathy and understanding towards the person's emotions, which makes this technique effective (Knowles & Riner, 2011). When the reactance is lowered, the effects of the fear appeal can be increased, which ultimately leads to more intention to perform the protective behaviour, in this case complying to the 1,5-meter policy in small social settings.

Research has found that the protection motivation theory can also be linked to attitudes towards the protective behaviour. Rogers (1975) stated that attitudes were changed when a person appraises themselves to be vulnerable and the treat to be severe. Fear appeals aim to influence these aspects of the protection motivation theory, which makes this strategy also likely to effective in influencing attitudes. Furthermore, Knowles and Riner (2011) state that negative attitudes make it difficult to achieve the performance of protective behaviours, as people are resistant to change. However, when this resistance towards the behaviour change is lowered, the attitude

towards the message can also become more positive (Knowles & Riner, 2011). ‘Acknowledging resistance’ might therefore be useful to not only increase the intention to comply, but also change the attitudes to be more positive.

To investigate the effectiveness of the strategy ‘acknowledging resistance’ and of fear appeals, two posters will be made and presented to three different groups. Both posters use fear appeal, in which the risk and coping appraisal will be influenced, and in one of the posters ‘acknowledging resistance’ will be added to lower the reactance. These posters will be tested against a control group to be able to tell the effectiveness. Attitude was found to potentially be influenced by the fear appeals, and when the reactance is lowered the influence might be stronger. It can be hypothesized that (H1) the group exposed to the strategy ‘acknowledging resistance’ in combination with a fear appeal message will show the most positive attitude towards the 1,5-meter policy, followed by the group who was only exposed to the fear appeal message, with the control group having the least positive attitude. As said, fear appeals in this setting also potentially influence the intention to comply by increasing the risk and coping appraisal. The ‘acknowledging resistance’ strategy takes away the reactance towards the recommended behaviour, and therefore makes it likely that the recipient of the fear appeals has even more intention to perform the recommended behaviour. It can therefore be expected that (H2) the group exposed to the strategy ‘acknowledging resistance’ in combination with a fear appeal message will show the most intention to comply with the 1,5-meter policy, followed by the group who was only exposed to the fear appeal message, with the control group having the lowest intention to comply.

Methods

Design

In order to measure the constructs, a between-groups design was employed. There was one independent variable (condition) with three levels (control, fear appeal, combination). The fear appeal and combination condition were both experimental conditions, in which two different posters were used to potentially influence the dependent variables. The dependent variables were intention to comply with the 1,5-meter policy in small social

settings, and attitude towards the 1,5-meter rule in small social settings. The distribution of the groups was allocated randomly over the three conditions.

Participants

The original data consisted of 207 participants, of which 93 were removed. The ones excluded did not give consent and/or did not complete the study or did not fulfil the requirements of living in The Netherlands and/or being between 18 and 24 years old. This resulted in a data sample consisting of 114 participants, of which 54 were male and 60 were female ($N = 60$). Most of the participants were occupied as students, namely 103. Furthermore, 9 were full-time employed, 1 was part-time employed and 1 combined a part-time job with a full-time traineeship. All participants were citizens of The Netherlands between the ages of 18 and 24 ($M = 20{,}94$, $SD = 1.53$). As said, the groups were randomly allocated over the three conditions, which resulted in 42 participants in the control condition, 43 in the fear appeal condition, and 29 in the combination condition.

To see if the participants were randomized per condition, multiple statistical tests have been conducted. For age, Shapiro-Wilk tests indicated a violation of the normality assumption for the control condition, $W(42) = .94$, $p = .03$, and for the combination condition, $W(29) = .85$, $p = .00$. On the other hand, the normality assumption was supported for the fear appeal condition, $W(43) = .95$, $p = .06$. Inspecting histograms for the three conditions confirmed the findings of the Shapiro-Wilk tests. As for the assumption of equal variances, Levene's test showed that these are equal, $F(2,11) = .66$, $p = .52$. Since the normality assumption was violated for two of the three conditions, the non-parametric equivalent of the one-way ANOVA, Kruskal Wallis was performed. It showed there was no significant difference in age between conditions, $H(2) = .76$, $p = 0.69$. From a one-way ANOVA it became apparent that there was no significant difference in age per condition, $F(2, 111) = .34$, $p = .72$[1]. It can therefore be concluded that age was randomized successfully over the three conditions.

To check the differences in randomization for gender, a chi-square test of independence was performed. The assumptions were supported, as 0% of the cells counted less than five and the minimum expected count was 13.74. There was no significant relationship found between condition and gender, $x^2(2, 114) = 1.06$, $p = .59$. This indicated that gender was randomized successfully over the three conditions.

As for occupation, the assumptions for the chi-square test were violated, because 75% of the cells are expected to count less than five and the minimum expected count is .25. The reason is that the majority of the participants in the sample were students, with only a small number of people who had another occupation. After grouping all the people who were not students into one category 50% of the cells are expected to count less than five and the minimum expected count is 2.80, meaning that the assumptions are still not supported. There was no significant difference in occupation between the conditions, $x^2(2, 114) = 6.13$, $p = .74$. Although the assumptions were not perfectly supported, it can still be concluded that the occupation was randomized successfully over the conditions.

Furthermore, the participants had to answer questions on whether they, their family members, or other close ones have had COVID-19. To see if these are randomized over the three conditions, a chi-square test was performed. First, it was looked at the question whether the participant themselves had been infected. The assumptions for the chi-square were supported, since 0% of the cells have an expected count of less than five and the minimum count is 6.11. No significant difference between groups was found, $x^2(4, 114) = 7.27$, $p = .12$. This showed that people who had been infected, who have not been infected and people who were not sure were randomized successfully over the three conditions.

Next, it was looked at if the people whose family members had been infected or not were randomized over the conditions. The assumptions were violated, since 33,3% of the cells have an expected count of less than five and a minimum expected count of 1.78. The choice option ‘I am not sure’ was removed, as this response does not give information on whether family members have been infected. This led to 0.0% having a count less than five and a minimum expected count of 13.12. No significant difference between groups was found, $x^2(2, 107) = 1.84$, $p = .40$. This indicated that the participants of whose family have been infected with COVID-19 or not were randomized successfully over the conditions.

Last, the randomization was checked for the participants who knew any other person close to them that has been infected with COVID-19. The assumptions were violated, as 33,3% of the cells have an expected count of less than five and a minimum expected count of 1.02. The option choice ‘I am not sure’ was removed again.

The assumption was almost supported, since 16.7% have an expected count of less than five, which was one cell, and a minimum expected count of 4.73. No significant difference between groups was found, $x^2(2, 110) = 0.173$, $p = .92$. Although the assumptions were not perfectly supported, this result showed that the participants who knew any other person close to them that has been infected with COVID-19 were randomized successfully over the conditions.

Concluding, age, gender, and occupation were successfully randomized over the conditions. The participants who had been infected themselves, who knew family members that had been infected and knew other close ones who had been infected were also successfully randomized over the conditions.

Materials

An online questionnaire was created using Qualtrics, in which the two created posters were presented to the participants. These can be found in Appendices A and B. The posters both contained a fear appeal message, which was based on the previously noted study from Tannenbaum et al. (2015). They state that fear appeals are more effective when high amounts of fear are evoked when the severity and vulnerability are stressed, and when a self-efficacy message is added. To stress the severity and vulnerability, two pictures were used in combination with the following line: '(But) do you want your loved ones to end up like this?' One picture shows a man who is being treated by multiple nurses while lying on his back, while in the other picture a woman of middle age who is wearing an oxygen mask in the hospital can be seen. This picture of a woman this age is chosen for the reason that the youth does not perceive themselves as vulnerable to the virus (RIVM, 2020b). A picture of a middle or older aged person would consequently evoke more fear than a picture of an adolescent, because older people are more vulnerable than the adolescent perceives themselves to be (World Health Organization, 2021). Combining the pictures with the question if they want their loved one in this position is meant to make adolescents think and understand that this could easily happen to a person close to them, and therefore evoke feelings of fear.

To further stress vulnerability and severity, the following text is added: 'If you do not socially distance yourself, you put the lives of others at risk. Over 17.000 people have died from COVID-19 in The Netherlands (RIVM, 2021). Your loved ones can meet the same fate.' These sentences are added to make the recipient

understand that they have a personal risk for negative consequences when they do not take action. It is meant to make the recipient realize they make others vulnerable because of their behaviour, which can cause other persons, including their loved ones, to become ill (Tannenbaum et al., 2015).

An efficacy statement is also added to make sure that the recipient knows how to act in the situation and to reassure that they are capable of doing so (Tannenbaum et al., 2015). On the posters can be read: 'Stay 1,5-meters apart to keep them safe. Also with friends, family & neighbours'. This sentence is accompanied by two young-looking drawn persons, who have a line with arrows between them, indicating the 1,5-meters. This combination creates an efficacy message that shows and tells how to perform the desired behaviour, which is keeping distance in small social settings.

As for the lay-out of the posters, the choice was made to use the exact same blue the RIVM uses in their communication with the public, for example on their site or posters. As discussed before, messages come across better when the source is seen as credible by the public (Leiss, 1996). Choosing the colours of the RIVM might thus improve the credibility of the message. The font style and size were chosen based on clarity and readability to establish that the recipient has no difficulty reading the posters.

So far, all elements on the posters were the same. There is, however, one crucial difference between the two, namely the addition of the following line in the poster belonging to the combination condition: 'We know keeping distance is hard'. This is the strategy of 'acknowledging resistance' that is mentioned by Knowles and Riner (2011), which is meant to lower feelings of reactance, as was discussed before.

In a manipulation check, the two posters were tested to see if they had the intended effect of increasing risk-perception, self-efficacy, and decreasing reactance. Using a one-way between-subjects MANOVA it was looked at if these variables were significantly higher for the two conditions in which the poster was shown, compared to the control group. First was tested if the assumptions of no multivariate outliers, linear relationships, normal distribution, and multicollinearity were accounted for. A potential multivariate outlier was found, using Malahanobis distances. One participant superseded the critical value of 18.47 that belongs to 4 degrees of freedom, namely with a value of 19.23. The participant was not excluded from the sample as their Cook value

was .02, which does not indicate that this participant was an outlier. To test if the relationships were linear multiple scatterplots were created, in which can be seen that the relationships were indeed linear. Shapiro-Wilk tests showed a violation of the normality assumption for reactance, $W(114) = .96$, $p = .00$ and risk-perception, $W(114) = .97$, $p = .03$. The assumption was, however, supported for self-efficacy, $W(114) = .99$, $p = .32$. After inspecting the histograms, it can be said that these variables are approximately normally distributed. No multicollinearity was found as there were no Pearson correlations higher than .8 between risk-perception, self-efficacy, and reactance. With all the assumptions supported, the one-way between-subjects MANOVA showed there was no significant difference between the extent to which risk-perception, self-efficacy, and reactance were experienced differently in the three conditions, $F(8, 216) = .61$, $p = .77$.

The results of the manipulation check indicated that the posters did not have the intended effect of influencing risk-perception, self-efficacy, and decreasing reactance, as there was no significant difference between these variables for the groups who were presented with a poster and the group who was not.

Measures

The participants were presented with a questionnaire, which can be seen in Appendix C. In the questionnaire, the dependent variables attitude and behavioural intention were measured, as it was aimed to influence these with the posters. Self-efficacy, perceived risk and reactance are also measured, since these are the variables used in the posters. By measuring these variables, it was possible to check if the manipulation of the posters was successful or not. Furthermore, some evaluative questions were asked. This was also done to be able to tell if one group evaluated the poster differently than another, which could potentially influence the results. Lastly, some questions on demographics were asked.

Attitude. To measure attitude, a scale from Dillard and Shen (2007) was adjusted. Participants' attitude towards the 1,5-meter policy in small social settings was measured using seven word pairs, which could be scored on a 7-point semantic differential scale. The word pairs were bad/good; foolish/wise; unfavourable/favourable; negative/positive; undesirable/desirable; unnecessary/necessary; and detrimental/beneficial. A higher score on this scale points to a positive attitude. This scale has internal reliability of .87, which is good (Gliem & Gliem, 2003)

Behavioural intention. Behavioural intention was measured by adapting the Risk Perception Attitude Framework (Rimal & Real, 2003). Three items from this scale that were related to intention were adjusted to the behavioural intention towards the 1,5-meter policy in small social settings. An additional item was added to make the questionnaire more extensive, making it a total of four items. The items, e.g. 'I intent to avoid coming closer than 1,5-meters to my friends' and 'I intent to socially distance myself from my family (other than my household) ' were measured on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). A high score indicates a high level of intention to follow the 1,5-meter rule. This scale had an internal consistency of .82, which is good according to Gliem and Gliem (2003).

Self-efficacy. To measure self-efficacy, a scale was developed based on Bandura's (2006) guide for constructing self-efficacy scales. Four items were created, that measured the participant's self-efficacy with regards to the 1,5-meter setting in small social gatherings. Examples of these items are: 'I am able to keep 1,5-meters distance when I visit a friend' and 'I feel confident that I can keep the 1,5-meters distance when I am seeing my family'. These could be rated by reporting a number from 0 (*cannot do at all*) to 100 (*highly certain can do*) on a slider. A high score indicates a higher level of self-efficacy. The Cronbach's alpha was .87, which indicates a good internal consistency (Gliem & Gliem, 2003).

Perceived risk. To measure the perceived risk, the COVID-19 Perceived Risk Scale was adapted (Yıldırım & Güler, 2020b). This scale consists of eight items that were all adjusted to measure the cognitive and emotional perceived risk with regards to the 1,5-meter policy, e.g. 'I think it is likely that I get infected with COVID-19 if I do not keep 1,5-meters distance from others in small social settings' and 'I worry about a family member getting COVID-19 when I do not keep 1,5-meters distance from them'. Answers were given on a 5-point Likert scale that reaches from 1 (*strongly disagree*) to 5 (*strongly agree*). A high score indicates a high level of perceived risk. The internal reliability was .74, which is acceptable (Gliem & Gliem, 2003).

Reactance. Reactance was measured by adapting the Salzburger State Scale for the Student Scenario to the current reactance-arousing situation (Sittenthaler, Mattausch, Mühlberger & Jonas, 2015). This scale contains four questions on reactance that had to be answered on a 5-point Likert scale reaching from 1 (*not at all*) to 5

(*very much*). Examples of these questions are: 'To what extent do you perceive the 1,5-meter policy as a restriction of freedom of your social life?' and 'When you go to see other people, are you frustrated about the existence of the 1,5-meter policy?' A high score on this scale points to a high level of experienced reactance with regards to the 1,5-meter policy. Good internal consistency of .85 was found (Gliem & Gliem, 2003).

Evaluation. Lastly, some statements were used to measure the opinions of the participants on the posters they had seen. These statements do not come from one original source but were inspired by poster scoring forms from the University of South Dakota (2019) and NC State University (n.d.). Statements on both the message, e.g. 'The message on the poster is clear', and the design, e.g. 'The words on the poster are easily readable', were asked, to see how the participants evaluated the poster. These statements could be rated on a Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The higher the score, the more positive the participant viewed the poster.

Demographics. Furthermore, the participants were asked to fill in some demographic questions, namely their gender, age, country of residence and occupation. It was also asked whether the participants themselves, their family or any other people close to them had been infected with COVID-19, as this might influence their views on COVID-19. By asking these questions, it could be checked if these people were randomized over the conditions.

Procedure

Participants were presented with a survey on the site Qualtrics. The participants were recruited by distributing the questionnaire on the social media of the researcher and by publishing it on SONA, which is a site on which students from the University of Twente can fill in surveys. The study was ethically approved by the ethical committee of Behavioural, Management and Social sciences of the University of Twente.

At the start of the survey, the participants were informed about the goals of the study and their rights as a participant and were asked to fill out the informed consent. In this informed consent, not all the details on the study were given right away. They were told that the study aimed to get insight into the way Dutch adolescent citizens evaluate information about COVID-19 policies, especially the 1,5-meter policy, to be better able to adjust

information to this group. The actual goal, influencing their compliance behaviour with the 1,5-meter policy in small social settings, was not mentioned as this could lead to feelings of reactance. Provoking these feelings beforehand was undesirable, as reactance was one of the variables that was influenced in the study.

Afterwards, the respondents were divided into three different groups: the control condition, the fear appeal condition, and the combination condition. The control group was presented with the questions first, in the following order: intention to comply, risk perception, self-efficacy, reactance and attitude towards the policy. Then the fear appeal poster is shown for at least 15 seconds to make sure that the participants had taken a look at it. The poster was followed by the evaluative questions. This is different from the fear appeal and combination condition, who both were directly presented with one of the two posters. This is done to be able to test the poster groups against the control group to see if the posters had made any influence. After seeing the poster for 15 seconds, the questions had to be answered in the following order: reactance, attitude towards the policy, risk perception, self-efficacy, and intention to comply.

Next, all three groups had to fill in questions on demographics as well as questions on whether they or people they know have been infected with COVID-19. The survey ends with a debriefing, in which the actual goals of the study and reasons for not directly mentioning them were explained, namely that the goal was to influence compliance with the 1,5-meter policy in small social settings, and not to just get insight into the way Dutch adolescent citizens evaluate information about this policy. It was also explained that reactance is undesirable in persuasive communication, and this therefore was not mentioned in the informed consent. Participants had the opportunity here to choose whether or not they still give consent for their data to be used. Lastly, they are thanked for their participation and the survey ended.

Data Analysis Plan

To test the previously noted hypotheses, the data sample was analysed using SPSS. First, the randomization was checked. An ANOVA was used to see if age was randomized over the conditions, after checking the assumptions of equal variances and normal distribution. A chi-square test of independence was used to see if gender and occupation were randomized over the conditions after checking the assumptions that less than

20% of the frequencies was less than five and that the minimal expected frequency is one. The same was done for the three questions on whether the participant, their family or other close persons had been infected with COVID-19, to make sure that these were also randomized over the condition.

Next, a manipulation check was performed to test if the posters had the intended effect of influencing the risk-perception, self-efficacy, and reactance. After making sure that the assumptions of multivariate outliers, linearity, normality, homogeneity of variance and multicollinearity were checked a MANOVA was performed, in which the condition presented with the fear appeal poster and the condition with the combination poster were tested against the control condition. In the manipulation check it was also looked at if there was a difference in the way the posters were evaluated by the different conditions using an ANOVA after checking the assumptions of equal variances and normality.

Lastly, for all three hypotheses an independent samples t-test was used to compare if there was a difference in intention to comply, and attitude between the fear appeal condition and the combination condition. This was performed after checking the assumption of normality and equal variances.

Results

Descriptive statistics

Table 1, which can be seen below, shows the means of the total scores and standard deviations of intention, self-efficacy, attitude, self-efficacy, and risk perception.

Table 1

Means and standard deviations per condition and F and p values for the dependent variables

Variable	Control ($N = 42$)		Fear appeal ($N = 43$)		Combination ($N = 29$)		F	p
	M	SD	*M*	*SD*	*M*	*SD*		
Risk-perception	2.93	0.66	2.94	0.72	3.05	0.81		
Self-efficacy	54.50	22.92	52.74	18.02	51.80	25.50		
Reactance	3.58	1.06	3.26	0.92	3.34	1.08		
Attitude	4.36	1.23	4.52	0.99	4.37	1.38	.21	.81
Intention	3.83	1.38	3.62	1.23	3.99	1.49	.65	.53

Note. Risk-perception could be scored from 1 to 5. For self-efficacy a number between 0 and 100 could be recorded. Reactance was scored between 1 and 5. Attitude went from 1 (negative) to 7 (positive). Intention could be scored between 1 and 7 as well.

Table 2 shows the Pearsons' correlations between variables. There were multiple variables that correlate significantly. First of all, intention and risk-perception had a high positive correlation. This entails that participants who scored high on intention also had a high score on risk-perception, and that the ones with a higher score on risk-perception were also scoring higher on intention. A moderate positive correlation was found between intention and self-efficacy, which means that participants who had a high intention to comply were also likely to have a higher sense of self-efficacy, and vice versa. Furthermore, intention and self-efficacy appeared to have a low positive correlation, just as attitude and risk-perception. Lastly, reactance and attitude seem to correlate significantly, but this correlation was so small it could be considered negligible (Jaadi, 2019).

Table 2

Pearson correlation matrix

Variables	1.	2.	3.	4.	5.
1. Reactance	1				
2. Intention	-.13	1			
3. Risk-perception	-.071	.57**	1		
4. Self-efficacy	-.060	.50**	.16	1	
5. Attitude	-.35**	.30**	.43**	.14	1

** Correlation is significant at the 0.01 level (2-tailed).

Evaluative questions

A one-way ANOVA was conducted to test if there are any differences in the way the participants evaluated the posters between the conditions. To check the assumption of normality, the Shapiro-Wilk test was performed. It indicated a violation of the normality assumption for the control condition, $W(42) = .91$, $p = .00$. On the other hand, the assumption was supported for the fear appeal condition, $W(43) = .99$, $p = .95$, and for the combination condition, $W(29) = .98$, $p = .70$. Inspecting the histogram of the control condition, the findings of the Shapiro-Wilk were not confirmed, since the histogram looks approximately normal. As for the assumption of equal variances, Levene's test revealed that these were equal, $F(2,111) = .20$, $p = .82$. There was no significant difference in evaluation of the poster between the conditions, $F(2, 111) = 1.05$, $p = .35$. This indicated that there are no differences in the way the participants of the three different conditions evaluated the posters.

Inferential statistics

First, it was tested using an ANOVA if there was a difference in attitude between the participants who have been exposed to the fear appeal strategy and the combined strategy, as opposed to the respondents in the control condition who have not been exposed to a strategy. It was expected that the ones in the combination

condition scored the highest on attitude, followed by the fear appeal condition, and the control condition. Shapiro-Wilk tests indicated that the normality assumption was supported for the control condition, $W(42) = .96$, $p = .13$, for the fear appeal condition, $W(43) = .98$, $p = .50$ and for the combination condition, $W(29) = .95$, $p = .17$. Levene's Test indicated equal variances, $F(2, 111) = 0.56$, $p = .57$, indicating that the assumption of equal variances was also confirmed.

From a one-way ANOVA it became apparent that there was no significant difference in attitude per condition, $F(2, 111) = .21$, $p = .81$. It can therefore be concluded that there was no difference in attitude over the three conditions. The first hypothesis was rejected for this reason.

Secondly, it was looked at if there was a difference in the intention to comply between the participants in the fear appeal, combination, and control condition. It was expected that the participants in the combination condition would have to highest intention to comply, followed by the fear appeal condition, and the control condition. Shapiro-Wilk tests indicated that the normality assumption was supported for the control condition, $W(42) = .95$, $p = .08$, for the fear appea1 condition, $W(43) = .97$, $p = .38$, and for the combination condition, $W(29) = .96$, $p = .29$. Levene's Test indicated equal variances, $F(2,11) = 1.32$, $p = .27$.

The one-way ANOVA showed that there was no significant difference in age per condition, $F(2, 111) = .65$, $p = .53$. This indicates that there was no significant difference in intention to comply between the conditions. The second hypothesis was therefore rejected.

Discussion

The research question posed in the beginning was: 'What is the effect of persuasive communication strategies on compliance with the 1,5-meter policy in small social settings of Dutch citizens aged 18 to 24?' It was investigated whether the chosen persuasive communication strategy, namely fear appeal and the combination of fear appeal and 'acknowledging resistance', would influence the intention to comply compliance and the attitude towards this policy. However, the results showed that there were no differences in intention to comply and attitude between the fear appeal, combination, and the control condition. Both hypotheses were rejected.

A reason for the rejection of the hypotheses was found in the manipulation check. It showed that the posters did not have the intended effect of influencing the risk-perception, self-efficacy and reactance, as there were no differences between the control condition and the conditions who were presented with a poster. Looking at the means for reactance, there can be seen that reactance was experienced moderately for all the conditions with only minor differences. This tells us that reactance was indeed experienced, but the 'acknowledging resistance' did not have a significant effect on lowering it. For self-efficacy, the means are also moderate for all conditions with only slight differences between them. This indicates that the participants already had somewhat of a sense of self-efficacy, but the posters failed to improve this. The means on risk-perception showed an already moderately perception of risk over all the conditions, with only minor differences between groups. But again, the posters did not have an influence in increasing it further.

The randomization could potentially be an explanation for the failed manipulation, but the results show that age, gender, and occupation were randomized. The participants who had been infected with COVID-19 were also randomized, as well as participants who had a family member or any other person close to them fall ill with the disease. Furthermore, the participants in all conditions evaluated the poster approximately the same. The means of the evaluative questions indicate that the participants viewed the posters as (moderately) positive, since they reported that the posters were readable, understandable, clear, attractive, balanced, and organized. Taken together, there seems to be no problem in randomization or evaluation of the poster. This indicates there is something else that caused the manipulation not to work and the hypotheses to be rejected.

An explanation might be that the self-efficacy, risk-perception and reactance were not sufficiently influenced, causing the manipulation not to work. It is possible that the severity and susceptibility were not stressed enough, which has led to a moderate score on risk-perception. If the used pictures or text would evoke more fear or were stressed more, the risk-perception might have been higher. This would also have influenced the intention to comply and attitude (Tannenbaum et al., 2015; Rogers, 1975). For self-efficacy goes the same. It might potentially have made a difference if the message was stronger and made the recipient more confident to perform the recommended behaviour (Tannenbaum et al., 2015). As for reactance, there are more kinds of

resistance than reactance that can emerge when change is proposed, like scepticism or inertia (Knowles & Riner, 2011). There are other strategies that can lower these kinds of resistances, so these could have been a better fit when trying to lower resistance.

Another explanation why the manipulation did not work is that the survey was made in English. This was done because the study targeted Dutch adolescent citizens, which includes people who potentially are not Dutch natives. Many of the respondents, however, gave feedback that they experienced trouble filling in the survey, as the English were too difficult. It can be the case that the respondents did not understand the question, and therefore reported answers that they did not intend to give. This can lead to different answers than would be given if the question was understood correctly, and consequently can cause the results to not be true to reality.

Limitations

A limitation of the study concerns the previously noted problem that many of the respondents gave feedback that they had trouble filling out the survey, as they experienced the English in the survey to be too difficult. This potentially led to answers and results that are not reflecting reality. Moreover, it caused many of the participants to quit the survey early, which consequently made the sample sizes of the conditions unequal as many responses had to be deleted. The control condition and fear appeal condition were approximately equal, but the combination condition had fewer participants. Statistical power can be lower as a consequence, making it harder to find true effects (Button et al., 2013).

Further research

Some suggestions for future research can be made. Like was said earlier, it would be interesting to change the ways self-efficacy, risk-perception and reactance, to see if the fear appeal would work after all. It is recommended to stress the severity and susceptibility more to increase the perception of risk. The self-efficacy message should also be stronger to increase this. Also, other kinds of resistance and a suiting kind of strategy could be investigated to lower the experience of resistance. To overcome the limitation that many Dutch adolescents experienced the English to be too hard, a Dutch version can be made. Furthermore, it would be useful

to investigate other communication strategies than fear appeals that affect compliance, as the manipulation did not work in the current study.

Theoretical implications

The current findings are not in line with previously noted studies, like the study by Knowles and Riner (2011) or the one performed by Tannenbaum et al. (2015). Many other studies can be found in which fear appeals were effective in making the recipients engage more in protective behaviours. Support has also been found for the strategy of 'acknowledging resistance', in which self-efficacy was improved, the perception of risk was raised, and reactance was lowered. This study shows, however, a case in which these variables were not influenced by the manipulation with neither the fear appeal nor the combination of strategies, contradicting previous research. There might be another strategy that is more suitable for Dutch adolescent's compliance with the 1,5-meter policy in small social settings that has yet to be investigated.

Practical implications

Influencing compliance behaviour in young adults can influence the safety of the citizens during the pandemic, as high compliance rates can decrease the threat that is caused by the virus, (Cooper, 2016). This research has found that fear appeal and 'acknowledging' resistance did not work for the current setting, but now other strategies can be investigated that potentially have more effect. It is important that this is done, as the threat that COVID-19 causes can be reduced if the rules are better complied with. Doing more research into this topic can therefore be beneficial for the safety of all Dutch, if not worldwide, citizens.

References

Bandura, A. (2006). Guide for constructing self-efficacy scales. *Self-efficacy beliefs of adolescents*, *5*(1), 307-337.

van Bavel, R., Rodríguez-Priego, N., Vila, J., & Briggs, P. (2019). Using protection motivation theory in the design of nudges to improve online security behavior. *International Journal of Human-Computer Studies*, *123*, 29-39. https://doi.org/10.1016/j.ijhcs.2018.11.003

Blackwell, B. (1992). Compliance. *Psychotherapy and psychosomatics*, *58*(3-4), 161-169. https://doi.org/10.1159/000288624

Boin, A., 't Hart, P., Stern, E., & Sundelius, B. (2005). *The Politics of Crisis Management.* Cambridge University Press.

Button, K. S., Ioannidis, J. P., Mokrysz, C., Nosek, B. A., Flint, J., Robinson, E. S., & Munafò, M. R. (2013). Power failure: why small sample size undermines the reliability of neuroscience. *Nature reviews neuroscience*, 14(5), 365-376. https://doi.org/10.1038/nrn3475

Chan, E. Y. (2021). Moral foundations underlying behavioral compliance during the COVID-19 pandemic. *Personality and individual differences*, *171*. https://doi.org/10.1016/j.paid.2020.110463

Cooper, B. (2017). What drives compliance? An application of the theory of planned behaviour to urban water restrictions using structural equation modelling. *Applied Economics*, *49*(14), 1426-1439. https://doi.org/10.1080/00036846.2016.1218430

Centers for Disease Control and Prevention. (2020). *Ways COVID-19 spreads.* Retrieved 2021, March 22, from https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html

Dayton, B. W., & Bernhardsdottir, A. (2009). *Crisis management.* Retrieved 2021, March 22, from https://cdm.syr.edu/wp-content/uploads/2014/10/Crisis_Management_International_Encyclopedia_of_Peace.pdf

Dillard, J. P., & Shen, L. (2005). On the nature of reactance and its role in persuasive health communication. *Communication Monographs*, *72*(2), 144-168. https://doi.org/10.1080/03637750500111815

Franzen, A., & Wöhner, F. (2021). Coronavirus risk perception and compliance with social distancing measures in a sample of young adults: Evidence from Switzerland. *PloS one*, *16*(2). https://doi.org/10.1371/journal.pone.0247447

Gliem, J. A., & Gliem, R. R. (2003). *Calculating, Interpreting, and Reporting Cronbach's Alpha Reliability Coefficient for Likert-Type Scales*. Retrieved 2021, June 10, from https://scholarworks.iupui.edu/bitstream/handle/1805/344/Gliem%20&%20Gliem.pdf?s

Glik, D. C. (2007). Risk communication for public health emergencies. *Annu. Rev. Public Health*, *28*(1), 33-54.

Government of the Netherlands. (n.d.). *Dutch measures against coronavirus: basic rules for everyone.* Retrieved 2021, June 23, from https://www.government.nl/topics/coronavirus-covid-19/tackling-new-coronavirus-in-the-netherlands/basic-rules-for-everyone

Haleem, A., & Javaid, M. (2020). Effects of COVID 19 pandemic in daily life. *Current medicine research and practice*, *10*(2), 78-79. https://doi.org/10.1146/annurev.publhealth.28.021406.144123

Jaadi, Z. (2019). *Everything you need to know about interpreting correlations.* Retrieved 2021, June 24, from https://towardsdatascience.com/eveything-you-need-to-know-about-interpreting-correlations-2c485841c0b8

Jones, L., Palumbo, D., & Brown, D. (2021). *Coronavirus: how the pandemic has changed the world economy.* Retrieved 2021, June 9, from https://www.bbc.com/news/business-51706225

Knowles, E. S., & Riner, D. D. (2011). Omega approaches to persuasion: Overcoming resistance. In *The science of social influence* (pp. 83-114). Psychology Press.

Leiss, W. (1996). Three phases in the evolution of risk communication practice. *The Annals of the American Academy of Political and Social Science*, *545*(1), 85-94. https://doi.org/10.1177/0002716296545001009

Lippke, S., & Plotnikoff, R. C. (2009). The protection motivation theory within the stages of the transtheoretical model—Stage-specific interplay of variables and prediction of stage transitions. *British Journal of Health Psychology*, *14*, 211–229. https://doi.org/10.1348/135910708X399906

NC State University. (n.d.). *Poster review.* Retrieved 2021, May 2, from https://projects.ncsu.edu/project/posters/documents/poster-review.html

Nederlands Jeugdinstituut. (n.d.). *Gewenst gedrag van jongeren bevorderen en bevestigen*. Retrieved 2021, February 13, from https://www.nji.nl/nl/Download-NJi/Gewenst-gedrag-van-jongeren-bevorderen-en-bevestigen.pdf

Nivette, A., Ribeaud, D., Murray, A., Steinhoff, A., Bechtiger, L., Hepp, U., ... & Eisner, M. (2020). Non-compliance with COVID-19-related public health measures among young adults in Switzerland: Insights from a longitudinal cohort study. *Social Science & Medicine*, *268*. https://doi.org/10.31235/osf.io/8edbj

Panchai, N., Kamal, R., Cox, C., & Garfield, R. (2021). *The implications of COVID-19 for mental health and substance use*. Retrieved 2021, June 9, from https://www.kff.org/coronavirus-covid-19/issue-brief/the-implications-of-covid-19-for-mental-health-and-substance-use/

Pham, V., Nguyen, H., Tho, L. H., Minh, T. T., Lerdboon, P., Riel, R., ... & Kaljee, L. M. (2012). Evaluation of three adolescent sexual health programs in Ha Noi and Khanh Hoa Province, Vietnam. *AIDS research and treatment, 2012*. https://doi.org/10.1155/2012/986978

Rijksoverheid. (n.d.). *Coronavirus: overzicht communicatiemiddelen preventive en publieksvragen.* Retrieved 2021, March 22, from https://www.rijksoverheid.nl/onderwerpen/coronavirus-covid-19/coronavirus-beeld-en-video/communicatiemiddelen-campagne

Rimal, R. N., & Real, K. (2003). Perceived risk and efficacy beliefs as motivators of change: Use of the risk perception attitude (RPA) framework to understand health behaviors. *Human communication research*, *29*(3), 370-399. https://doi.org/10.1111/j.1468-2958.2003.tb00844.x

RIVM. (2021). *Epidemiologische situatie van SARS-CoV-2 in Nederland*. Retrieved 2021, April 27, from https://www.rivm.nl/sites/default/files/202104/COVID19_WebSite_rapport_wekelijks_20210427_1126_final.pdf

RIVM. (2020a). *Notitie jongeren in coronacrisis.* Retrieved 2021, February 13, from https://www.rivm.nl/documenten/notitie-jongeren-in-coronacrisis

RIVM. (2020b). *Dutch citizen's willingness to follow COVID-policies*. Retrieved from https://www.rivm.nl/gedragsonderzoek/maatregelen-welbevinden/naleven-gedragsregel

Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *The journal of psychology*, *91*(1), 93-114. https://doi.org/10.1080/00223980.1975.9915803

Roma, P., Monaro, M., Muzi, L., Colasanti, M., Ricci, E., Biondi, S., ... & Mazza, C. (2020). How to improve compliance with protective health measures during the covid-19 outbreak: testing a moderated mediation model and machine learning algorithms. *International journal of environmental research and public health*, *17*(19), 7252. https://doi.org/10.3390/ijerph17197252

Sauer, M. (2021). *What is Coronavirus?* Retrieved 2021, March 22, from https://www.hopkinsmedicine.org/health/conditions-and-diseases/coronavirus

Shen, L., & Coles, V. B. (2015). Fear and psychological reactance. *Zeitschrift für Psychologie, 223*(4), 225-235. https://doi.org/10.1027/2151-2604/a000224

Sittenthaler, S., Traut-Mattausch, E., Steindl, C., & Jonas, E. (2015). Salzburger state reactance scale (SSR scale). *Zeitschrift für Psychologie, 223*(4), 257-266. https://doi.org/10.1027/2151-2604/a000227

Sommestad, T., Karlzén, H., & Hallberg, J. (2015). The sufficiency of the theory of planned behavior for explaining information security policy compliance. *Information & Computer Security*, *23*(2), 200-217. https://doi.org/10.1108/ICS-04-2014-0025

Tannenbaum, M. B., Hepler, J., Zimmerman, R. S., Saul, L., Jacobs, S., Wilson, K., & Albarracín, D. (2015). Appealing to fear: A meta-analysis of fear appeal effectiveness and theories. *Psychological bulletin*, *141*(6), 1178-1204. https://doi.org/10.1037/a0039729

Tunner Jr, J. F., Day, E., & Crask, M. R. (1989). Protection motivation theory: An extension of fear appeals theory in communication. *Journal of Business Research, 19*(4), 267-276. https://doi.org/10.1016/0148-2963(89)90008-8

University of South Dakota. (2019). *Creating a poster.* Retrieved 2021, May 2, from https://libguides.usd.edu/c.php?g=753097&p=5394204

West, R., Michie, S., Rubin, G. J., & Amlôt, R. (2020). Applying principles of behaviour change to reduce SARS-CoV-2 transmission. *Nature Human Behaviour*, *4*(5), 451-459. https://doi.org/10.1038/s41562-020-0887-9

Wilson, R. F., Sharma, A. J., Schluechtermann, S., Currie, D. W., Mangan, J., Kaplan, B., … Gieryn, D. (2020). Factors Influencing Risk for COVID-19 Exposure Among Young Adults Aged 18-23 Years - Winnebago County, Wisconsin, March-July 2020. *Morbidity and mortality weekly report*, *69*(41), 1497–1502. https://doi.org/10.15585/mmwr.mm6941e2

World Health Organization. (2021). *Coronavirus*. Retrieved 2021, March 22, from https://www.who.int/health-topics/coronavirus#tab=tab_1

Yıldırım, M., & Güler, A. (2020a). COVID-19 severity, self-efficacy, knowledge, preventive behaviors, and mental health in Turkey. *Death studies*, 1-8. https://doi.org/10.1080/07481187.2020.1793434

Yıldırım, M., & Güler, A. (2020b). Factor analysis of the COVID-19 Perceived Risk Scale: A preliminary study. *Death studies*, 1-8. https://doi.org/10.1080/07481187.2020.1784311

Appendices

Appendix A: Poster with fear appeal

Appendix B: Poster with the combination of fear appeal and acknowledging resistance

Appendix C: Questionnaire

Informed consent

Welcome

You are invited to take part in this research study. Before you take part, it is important that you understand the purposes of this research and your rights as a participant. Please read the following information carefully.

The purpose of this study is to gain insight into the way Dutch adolescent citizens evaluate information about COVID-19 policies, especially the 1,5-meter policy in small social settings. This is relevant to investigate, as information can better be adjusted to this group when more is known about the way they evaluate the information. When you agree to take part, you are presented with a survey that takes about 10 minutes to complete.

Your participation is voluntary and you are allowed to withdraw your participation at any moment without any consequences, and without providing any reasons. Moreover, all your responses to this survey will be anonymous, since it is not possible to be identified on the basis of the collected data. All the data will be stored securely and will not be shared with external parties. It is only used for the purposes of this study. The data will be deleted after the completion of the study. University of Twente students who participate through SONA will be rewarded with credits. This study has been approved by the BMS ethics committee. If there are any questions regarding this study or the rights you have as a research participant, feel free to contact a representative of the researcher.

I have read and understood the information provided to me and I agree to voluntarily take part in this questionnaire. Yes/ No.

Behavioural intention

Please indicate the extent to which you agree on the following statements.

I intent to...

- Avoid coming closer than 1,5-meters to my friends
- Socially distance myself from my family (other than my household)
- Make sure that I keep 1,5-mters when being with others
- Keep 1,5-meters distance when I meet up with someone

Attitude

Please indicate your attitude towards the 1,5-meter policy. With regards to small social settings, I think the 1,5-meter policy is…

- Bad/ Good
- Foolish/ Wise
- Unfavourable/ Favourable
- Negative/ Positive
- Unnecessary/ Necessary
- Detrimental/ Beneficial

Self-efficacy

Rate your degree of confidence by recording a number from 0 to 100 using the scale given below.

- I am able to keep 1,5-meters distance when I visit a friend
- I feel confident that I can keep the 1,5-meters distance when I am seeing my family (other than my household)
- I am capable of keeping 1,5-meters distance when another person is visiting me
- I am able to socially distance myself when I meet up with other people

Perceived risk

For each of the following statements, please indicate whether you agree or disagree.

- I think it is likely that I get infected with COVID-19 if I do not keep 1,5-meter distance from others in small social settings
- I think I am more likely to get infected with COVID-19 when I do not keep 1,5-meters distance in small social gatherings, compared to others who do not
- I think it is more likely that I get infected with COVID-19 if I do not keep 1,5-meter distance in small social settings than getting infected with another disease
- I think it is likely that I will die of COVID-19 if I do not keep 1,5-meters distance in small social meetings
- I worry about getting COVID-19 when I do not keep 1,5-meters distance in small social gatherings
- I worry about a family member getting COVID-19 when I do not keep 1,5-meters distance from them
- I worry that COVID-19 will occur among people close to me if I do not keep the 1,5-meters
- I worry that COVID-19 will emerge as a health issue when I do not keep 1,5-meters distance in small social settings

Reactance

Please indicate the extent to which the following questions apply to you.

- To what extent do you perceive the 1,5-meter policy as a restriction of freedom of your social life?
- When you go to see other people, are you frustrated about the existence of the 1,5-meter policy?
- How much does the 1,5-meter annoy you when you meet up with someone?
- To what extent are you disturbed by the 1,5-meter policy in small social settings?

Demographics

What is your gender?

- Male
- Female

- Other
- Prefer not to say

What is your age?

What is your country of residence?

- The Netherlands
- Germany
- Other

What is your current occupation?

- Student
- Full-time employed
- Part-time employed
- Unemployed and looking for work
- Unemployed and not looking for work
- Other

Have you been infected with COVID-19?

- Yes
- No
- I am not sure

Have any of your family members been infected with COVID-19?

- Yes

- No
- I am not sure

Evaluation

Please indicate your opinion on the poster you have previously seen.

- The poster is easy to understand
- The words on the poster are easily readable
- The message on the poster is clear
- All images are relevant on the poster
- The poster is attractive in terms of design
- The poster presents content to the viewer in an organized manner
- There is good balance between images and text

Debriefing

Thank you for participating in this research study.

Beforehand, you were given only general information about the goals of this study. However, more specifically, it was investigated how information can best be presented, with the help of persuasive communication strategies, to increase compliance with the 1,5-meter policy in small social settings. This is relevant to investigate, as increasing compliance with this policy among youth can reduce the risk of people getting infected with COVID-19. The strategy used in the posters, which was fear appeal, can lead to feelings of reactance (a form of resistance). Reactance is undesirable when trying to persuade others, and therefore another strategy was added in the poster to influence it, namely acknowledgement of resistance. Hence, it was important that you did not feel any reactance after reading about this in the informed consent.

All information regarding the data protection of the participants remains correct, so your data will be confidential and will not be shared with third parties. In case of further questions, feel free to contact the representative of the researcher.

Knowing this information, do you still give consent for your data to be used in this study? Yes/ No.