

Bachelor Thesis

**The Persuasiveness of Foreign Language Use in Informational and Emotional Meat
Reduction Advertisements**

Frances van Drogenbroek (s1022811)
Radboud University, Faculty of Arts,
BA International Business Communication
Supervised by E.R. Felker
07-06-2021

Abstract

Bilinguals have frequently reported that messages feel more emotional in L1 than in L2. The experienced reduction of emotional resonance is called the foreign language effect (Caldwell-Harris & Aycicegi-Dinn, 2016; Keysar et al., 2012). Whether this effect also plays a role in emotional social advertising is investigated in the present study. The influence of L1 (Dutch) and L2 (English) use and informational, positive emotional and negative emotional message appeals on the perceived emotionality, attitude towards the issue and behavioural intention of meat reduction ads were investigated. This was done by using a between-subjects design of 2 (language) X 3 (message appeal), administered through an online questionnaire among students. While message appeal did occur to affect the perceived emotionality, an effect of language was not found. Moreover, meat reduction ads did not emerge to be more persuasive in L1 than in L2, nor did the valence of the emotion appear to have created a significant difference. Further research, preferably longitudinal and ideally focused on a different population, needs to be done to gain more insight into how to create effective and persuasive social advertising.

Introduction

Globalisation is causing a defining shift in the 21st century (Arnett, 2002). A very observable feature of the globalisation process is the increase in the number of bilingual speakers (Johar et al., 2006). While bilingualism can be defined in numerous ways, Grosjean (2018) defines it as the regular usage of two or more languages by one speaker. He argues that bilingualism can be seen and experienced everywhere, such as at the workplace, in education, and science. Another way in which the increasing bilingualism can be noticed is in advertising. Puntoni et al. (2009) argue that marketing messages are decreasingly shown in the mother tongue of the consumer. In addition, marketing professionals make progressively more use of foreign languages in advertisements. To be more specific, Puntoni et al. (2009) declare that English is steadily more seen as a world language. English is not only a dominant language in various fields but also the language of consumers around the world (Crystal, 2003). In the Netherlands, 94% of all citizens can hold a conversation in at least one other language than Dutch, while 77% speak at least two foreign languages; the most spoken foreign language is English (Eurobarometer, 2012).

Bilingualism creates opportunities for communication specialists but also raises the question of how effective foreign language (FL) advertising is. Can second language (L2) advertisements be more effective and have a greater persuasive impact than first language (L1) advertisements, and in what circumstances? Previous research has looked at many aspects of FL advertising, such as ad comprehension (e.g. Gerritsen et al., 2000), product perceptions (e.g., Leclerc et al., 1994), and ad recall and recognition (e.g., Ahn & Ferle, 2008). Another important feature that is investigated, is the perceived emotionality of FL ads (e.g., Caldwell-Harris & Aycicegi-Dinn, 2016). Investigating this is useful, as emotion takes an important part in advertising, since building emotional experiences is an essential aim of brand communication (Puntoni et al., 2009).

The Effect of Foreign Language Use on Emotionality

Language has a significant function in the perception of emotions. Bilingual speakers have frequently reported that emotional expressions feel stronger in their native language than in a foreign language (Caldwell-Harris & Aycicegi-Dinn, 2016). This is not only the case for swear words and insults but also for marketing slogans (Puntoni et al., 2009). The effect of reduced emotionality in a foreign language is called *emotional blunting* (Caldwell-Harris & Aycicegi-Dinn, 2016). Keysar et al. (2012) discovered that language use influences decision-making, what they referred to as *the foreign language effect*. They suggest that the use of a

foreign language reduces decision biases, which can be explained by the greater emotional and cognitive distance that is experienced in a foreign language in comparison with a native language. This theory was tested by Pavlenko (2012), who found that L1 use leads to increased automaticity of affective processing, while the automaticity of affective processing decreased for L2 use. In addition, Puntoni et al. (2009) did several experiments where L1 and L2 ads were compared on how emotionality charged messages were perceived. They found that textual information presented in L1 tends to be perceived as more emotional than similar information in L2.

Several reasons for the foreign language effect are stated in previous research. Possibly, the reduced emotionality in a foreign language is caused by differences in the processing of L1 and L2. First language use activates automatic, effortless, and initiative processing (which is referred to as System 1 thinking) while foreign language use activates reflective, slower, and more controlled processing (System 2 thinking). Moreover, System 1 thinking is described as more emotional, while System 2 thinking is much more neutral (Kahneman, 2003). Caldwell-Harris and Aycicegi-Dinn (2016) state two possible explanations for the processing differences of L1 and L2. A first language may be more connected to emotional systems in the brain, which may cause emotional stimuli to be more salient when presented in an L1. This can lead to System 1 thinking, which is less controlled, and, therefore, decision-making could take place more automatically. However, processing a foreign language may take more cognitive effort and therefore capture System 2 thinking, which can lead to more analytical and deliberative decision-making, as the processing of an L2 is more controlled than that of an L1. Another possible explanation for differences in emotional resonance between L1 and L2 is given by Dewaele and Palgrave (2010). They argue that, when a language is learned in a classroom, fewer emotional memories are attached to it in comparison with naturally learned languages. In addition, classroom learning results in reduced emotional resonance for foreign languages compared to languages that are learned in a natural setting (Pavlenko, 2012). Moreover, the emotionality of the language diminishes as the age of learning increases: languages that are learned earlier in life are generally perceived as more emotional than languages that are learned at a later age (Dewaele, 2004). Another feasible cause is that the use of a foreign language activates specific stereotypes or that it is caused by a lack of comprehension of the L2 (Puntoni et al., 2009). On top of that, Degner et al. (2012) found that the usage frequency of a foreign language can also play a role, as more frequent L2 use may increase the accessibility of affective associations.

Because of the reduced emotional resonance that is experienced in L2, L1 ads are generally more effective (Puntoni et al., 2009). Caldwell-Harris and Aycicegi-Dinn (2016) argue that L1 advertising is the best option when little information is known about the target group. More knowledge about differences in emotional resonance in FL advertising could, therefore, be very helpful for communication professionals because it allows them to gain more insight into what type of advertising is the most persuasive for their target group, issue, or product.

Emotion and Persuasion

The goal of persuasion is changing the attitudes of people, which often is a result of delivering a message (Petty & Briñol, 2015). Emotions can influence the persuasive effect of a message in multiple possible ways, as it affects perception, cognition, and motivation (Dillard & Nabi, 2006). Moreover, decision-making often relies on emotion, consciously or unconsciously (Forgas, 2001). Emotional effects are elicited via emotional message appeals (Jorgensen, 1996). A message appeal should give the consumer a reason to pay attention to the ad and a motive to do what the advertisement promotes, for example, to change behaviour. Kotler and Keller (2015) proposed a distinction between the two types of message appeals. Informational or rational message appeals focus on the objective characteristics of the product or promoted behaviour, while emotional message appeals focus on the emotions that are associated with the promoted behaviour and try to elicit those to arouse an attitude and a behavioural change (Jorgensen, 1996). An emotional message appeal can either be positive (e.g., happiness) or negative (e.g., sadness) (Noble et al., 2014).

Persuasion Research on Social Advertising

While investigation on the persuasive effects of FL emotional advertising in marketing has been done (e.g., Caldwell-Harris and Aycicegi-Dinn, 2016), similar research has not yet been conducted in the field of social advertising. Social advertising is defined by Noble et al. (2014) as sponsored communication to change individual behaviour that is in accordance with social goals. Campaigns that focus on environmental issues are covered in this definition. An example of a subject of social advertising is the reduction of meat consumption.

Consumers' food choices highly affect the environment. It is estimated that food production has contributed 20-30% of the total environmental impact that is caused by human behaviour (Tukker & Jansen, 2006). Especially the consumption of animal proteins plays a large role in climate change (Aiking, 2011). Despite the environmental impact of their

behaviour, the readiness of consumers to reduce their meat intake is still low (Hartmann & Siegrist, 2017). According to Stoll-Kleemann and Schmidt (2017), emotional messages are preferred in food choice advertisement because information alone is not effective to reach dietary change. Kollmuss and Agyeman (2002) state that stronger emotional responses of consumers make the displaying of the desired behavioural change more likely. The study of Carfora et al. (2019) confirms this conclusion. Results of their longitudinal study illustrated that participants who were exposed to emotional messages reduced their (red processed) meat consumption, while this was not the case for the participants that had received informational messages.

Whereas research thus suggests that the use of emotional appeals in meat reduction advertisements is more effective than the use of informational appeals, the valence of emotions may also play a role. As stated by Donovan and Henley (2003), negative emotional appeals are commonly used in social advertising. Noble et al. (2014) found that the use of negative emotional appeals had a greater effect on the attitude towards the issue of climate change and the intention to engage in behavioural change. Although meat reduction adverts can focus on health, disgust, and environmental factors of meat consumption, findings suggest that focusing on animal welfare is more persuasive than focusing on other effects (Palomo-Vélez et al., 2018). Therefore, the current study uses meat reduction adverts that are focused on the consequences of meat consumption on animal welfare.

As the effect of FL use on emotionality and persuasiveness has not been investigated yet for (pro-environmental) social advertising, it may be interesting to explore how FL use affects the perceived emotionality and persuasiveness of social advertisements. Gaining insight and understanding into the persuasiveness of FL meat reduction ads creates more clarity into how to achieve effective persuasive communication, which is important from an environmental point of view. Knowledge about how to create effective campaigns can help communication professionals to motivate consumers to reduce their meat intake (Palomo-Vélez et al., 2018). The present study can thus lead to more insight into how to promote behavioural change concerning meat reduction among bilinguals.

To measure the effectiveness and persuasive impact of the advertisements, the perceived emotionality, attitude towards the reduction of meat consumption and the intention to engage in behavioural change are measured in the present study, Noble et al. (2014) namely found that the attitude towards the promoted behaviour in social advertisements influences behaviour. Moreover, emotion plays an important role in forming attitudes, as it is one of the

three components that shape attitudes, together with cognition and behaviour (Jorgenson, 1996).

Research Questions and Hypotheses

To find out what the persuasive effect is of foreign language use in meat reduction advertisements with informational, positive, and negative emotional appeals, several sub-questions are asked with corresponding hypotheses.

- I. Are meat reduction advertisements perceived as more emotionally charged in L1 than in L2?

Since the foreign language effect proposes that emotional expressions feel stronger in L1 messages (Caldwell-Harris & Aycicegi-Dinn, 2016; Keysar et al., 2012) and, as a consequence, are perceived as more emotional than L2 messages (Puntoni et al., 2009), the following hypothesis is stated:

H1: Meat reduction ads with an emotional appeal (whether positive or negative) will be perceived as more emotionally charged in L1 than in L2.

As the informational advertisement consists of neutral words, while the emotional advertisements contain emotional words, it can be assumed that informational meat reduction advertisements will be perceived as less emotionally charged than emotional meat reduction advertisements, both in L1 as in L2. Therefore, hypothesis 2 is:

H2: Meat reduction ads with an informational appeal will be perceived as less emotionally charged than ads with an emotional appeal, both in L1 as in L2.

- II. Are meat reduction advertisements more persuasive when presented in L1 than in L2?

Kollmuss and Agyeman (2002) conclude that stronger emotional responses are more likely to lead to behavioural change, and the study by Carfora et al. (2019) confirms that idea. Bearing in mind that messages are perceived as more emotionally charged in L1 than in L2 (Puntoni et al. 2009), it can be assumed that emotional meat reduction advertisements are more persuasive in L1 than in L2. Therefore, the third hypothesis derived from the literature is:

H3: Meat reduction ads with an emotional appeal (whether positive or negative) will lead to a more positive attitude towards the issue of meat reduction and a greater intention to engage in behavioural change when presented in L1 than in L2.

According to Kahneman (2003), FL use activates reflective, controlled processing, as it is less automatically processed than a first language. This can cause the decision-making process in being more systematic. Participants should therefore be less influenced by decision biases like emotionality in L2 than in L1 (Keysar et al., 2012). Derived from literature, the fourth hypothesis is:

H4: Meat reduction ads with an informational appeal will lead to a more positive attitude towards the issue of meat reduction and a greater intention to engage in behavioural change when presented in L2 than in L1.

III. Are meat reduction ads more persuasive when a negative appeal is used than when a positive emotional appeal is used?

Noble et al. (2014) found that the use of negative emotional appeals in a message of social advertising had a greater effect on the attitude towards the issue and the intention to engage in behavioural change than the use of positive emotional appeals. A similar pattern is expected in the present study, both for L1 ads as for L2 ads. Therefore, hypothesis 5 is:

H5: Meat reduction ads will lead to a more positive attitude towards the issue of meat reduction and a greater intention to engage in behavioural change when a negative emotional appeal is used than when a positive emotional appeal is used, both in L1 and in L2.

Method

Materials

The stimuli material consisted of three fictional text advertisements that were aimed at the reduction of meat consumption (see Figure 1, Figure 2, Figure 3, and Appendix A). More specifically, these ads focused on the animal welfare consequences of meat reduction. Every ad used one message appeal: either an informational message appeal, a positive emotional appeal that focused on self-image or a negative emotional appeal that focused on guilt, based on the study by Noble et al. (2014). A Dutch and English version were created for every version of the advertisement. Besides the language of the ad, no other elements were changed to make sure the semantic content of both advertisement versions was equivalent. To check this, a back-translation exercise was conducted by an independent translator. The length of the copy was similar in all six versions of the advertisement to ensure that the cognitive processing load was equal. Moreover, the headline was held constant to avoid confound effects, and all versions of the ad ended with a question. Besides that, the same design was used for every ad, namely white text on a black background. This neutral background was used to prevent an overwhelming effect of sensory appeal, as was done by Dubé and Cantin (2000), so that participants could completely focus on the message of the ad.

All three mock advertisements from based on the fictional ads used by Noble et al. (2014) and made use of information about meat production and consumption in the Netherlands from Centraal Bureau voor de Statistiek (2021) and Dagevos et al. (2020). To make sure that the right words were used in terms of the message appeal in the English versions of the advertisement, the dictionary of Warriner et al. (2013) was consulted. The dictionary of Zijlstra et al. (2014) was used to check the word use of the Dutch versions of the advertisement.

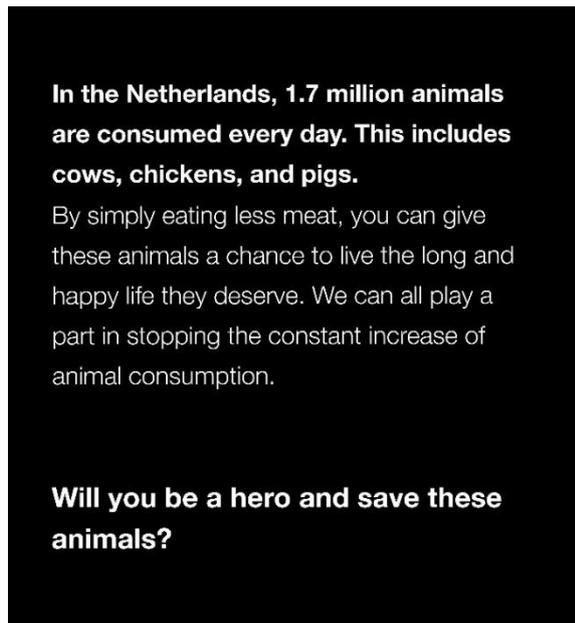
Figure 1. English informational advertisement.



Figure 2. English negative emotional advertisement.



Figure 3. English positive emotional advertisement.



Subjects

After the removal of a large amount of data (108 participants), due to participation conditions that were not met, 149 participants remained. Participants that were older than 18 years old, were a student, did eat meat, learned English after the age of 5, did not have a different mother tongue than (only) Dutch, and finished the complete questionnaire could participate in the experiment.

The participants were divided automatically and randomly among every condition. In each condition, 20-31 respondents participated. Participants did not consist of an equal distribution of gender, namely 22.1% men, 77.2% women, and 0.7% non-binary people. The age range was 18-30 years, with a mean age of 21.43 ($SD = 1.94$). Participants consisted of students at universities: bachelor (45%), master (15.4%), universities of applied sciences (HBO) (34.2%) and intermediate vocational education (MBO) (4%). A small number of participants reported that they did another kind of study via the option “Other” (1.3%). All participants were native speakers of Dutch with English as their second language. The self-reported English reading proficiency of participants was measured at a single item 7-point Likert scale (based on Krishna and Ahluwalia, 2008), anchored by “poor – excellent”. The average proficiency score was good ($M = 5.36$, $SD = 1.25$), good. Since this study used advertisements that were aimed at reducing meat consumption, the amount of meat that participants weekly ate was measured. Participants had to indicate how many days a week they ate meat on a 7-point Likert scale, anchored by never (0 days) – daily (6+ days), which is

replicated from the study of Kunst and Hohle (2016). The average score was 3.95 ($SD = 1.64$), close to 4 days a week of eating meat.

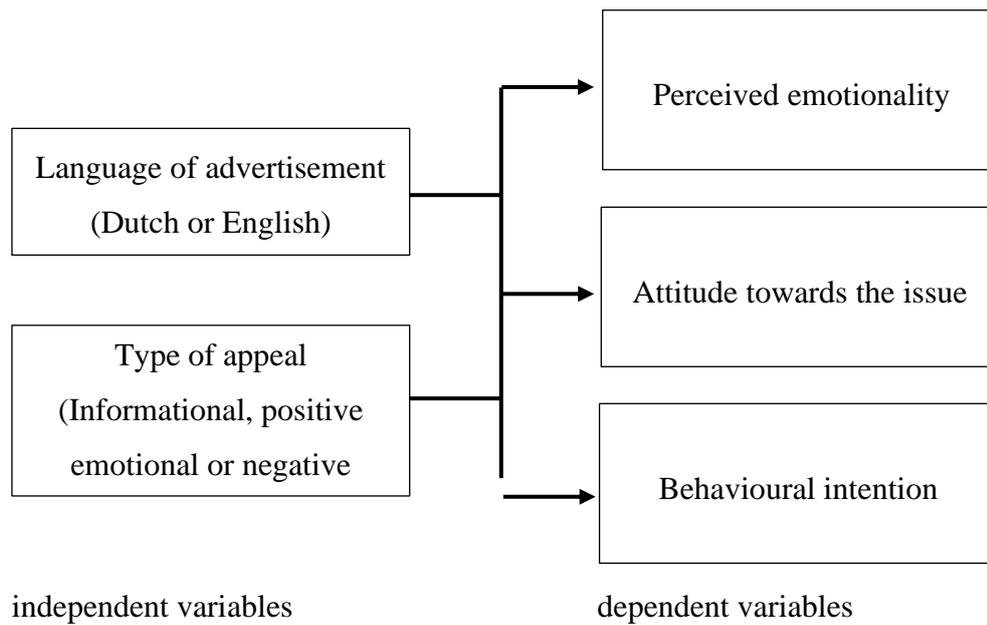
To limit potential differences in the groups that were not created by the researchers, it was checked to see if they were equal, several analyses of variance (ANOVA) were conducted. Results illustrate that groups were equal in terms age ($F(5, 143) = 1.37, p = .239$) and meat consumption ($F(5, 143) < 1$). Groups were not equal on English reading proficiency ($F(5, 143) = 3.74, p = .003$). There was a significant difference between the proficiency of the participants that saw the English informative appeal ($M = 5.88, SD = .992$) and the Dutch informative appeal ($p < .013$, Bonferroni-correction; $M = 4.77, SD = 1.38$). Another significant difference in proficiency was between the Dutch informative appeal ($M = 4.77, SD = 1.38$) and the English positive emotional appeal ($p < .030$, Bonferroni-correction; $M = 5.85, SD = .671$). Nevertheless, the found differences did not influence the results, as there were no significant differences between the English conditions. Two chi-square tests were conducted to see if groups were equal in terms of gender and educational level. The results indicated that the groups were equal regarding gender ($\chi^2(10) = 16.39, p = .089$) and educational level ($\chi^2(20) = 17.01, p = .652$).

The present study has used a convenience sampling method, which means that potential participants were personally asked to fill in the survey by the researchers. Participants were contacted via social media and text messages. They did not receive any (financial) reward for the participation in the study.

Design

The present study used a between-subjects of 2 (language of ad) X 3 (message appeal) factorial design. The independent variable language of the advertisement consisted of two levels, namely Dutch (L1) and English (L2). The independent variable message appeal consisted of three levels, namely informational, positive emotional (self-image), and negative emotional (guilt) appeal. Participants were randomly assigned to one of the six conditions. A between-subjects design was chosen to ensure that participants were not able to guess the objective of the experiment, as that could have influenced their evaluations. An analytical model is presented in Figure 4.

Figure 4. Analytical model of design.



Instruments

Three dependent measures were used post-exposure to test the effectiveness of the advertisements: perceived emotionality of the ad, attitude towards the issue and intention to engage in behavioural change. To measure the perceived emotionality, the scale by Puntoni et al. (2009) was used, which consisted of one item, measured on a 5-point Likert scale that was anchored by “strongly disagree - strongly agree”: “I think this ad is emotional.”. To measure the attitude towards the issue, the scale presented in the research by Noble et al. (2014) was used, only adjusted to the topic of meat reduction: “Because of this ad I would be concerned with eating less meat”. The scale consisted of a single item, measured on a 5-point Likert scale that was anchored by “strongly disagree - strongly agree”. Behavioural intention was measured by four items on a 7-point Likert scale, anchored by “strongly disagree - strongly agree”. The measurement was an adjusted version based on the measurements used by Hunter & Rööös (2012), which was inspired by Garnett (2011). The measurement consisted of the statement “Because of this ad, I intend to” followed by four meat reduction actions: “cut the number of meals with meat to half”, “refrain from eating meat/replace meat with meat substitutes”, “vegetables or beans/eat vegetarian food twice as often as today”. The reliability of the dependent measure behavioural intention comprising four items was good: $\alpha = .86$.

Procedure

The experiment was run via an online questionnaire that was designed in the web programme *Qualtrics*. The questionnaire was programmed in a way that every participant was

exposed to one condition only, namely an L1 or an L2 ad with an informational, positive emotional or negative emotional appeal. Accordingly, all participants saw only one version of the ad. The programme selected these conditions randomly. Participants took part in the experiment individually and could do this at home, on a device with an Internet connection. Before the questionnaire started, participants were informed about the questionnaire and had to sign a consent form to continue. The topic of the experiment was described shortly, without indicating the expected effects.

In the first part of the questionnaire, participants were asked to give certain demographics. Before showing the ad, participants filled in their age, gender, and educational background. The questionnaire was either in Dutch or English, depending on the language of the advertisement (and thus the condition to which the participant is assigned). Besides indicating their demographic information, participants were asked to indicate their weekly meat consumption.

In the second part of the questionnaire, participants were exposed to the ad. Beforehand, participants received a short instruction about the upcoming questions, in which was also explained that they could not return to the ad afterwards. Participants could go to the third section of the questionnaire whenever they were ready and felt like they had correctly seen and understood the ad.

In the third and last part of the questionnaire, participants were asked to rate their attitude towards the advertisement, their behavioural intention, and how emotionally charged they perceived the advertisement. After rating the attitude and intention, the participants were asked to rate how emotionally charged they perceived the language of the ad to be. To prevent that rating their perceived emotionality influenced the rating of their attitude and behavioural intention, this measure was asked after the other two dependent measures. When all questions were answered, participants were asked to rate their English reading proficiency. Lastly, participants had to indicate their age of learning English and if their native language was Dutch or another language, to ensure that they had Dutch as mother tongue and were not native speakers of English.

Participants were not debriefed at the end of the questionnaire, nor were they at the end of the research. However, participants had the chance to make a comment or complaint if they felt like that was necessary at the end of the questionnaire.

Statistical Treatment

To test the five presented hypotheses, statistical analyses were performed using IBM SPSS Statistics, version 25. The dependent variables, that were measured on 5-point and 7-point Likert scales, were changed into numeric variables to be able to conduct analyses of variance (ANOVA) and t-tests. A multivariate analysis of variance (MANOVA) was conducted for perceived emotionality, attitude towards the issue and behavioural intention with language and message appeal as factors. Follow up two-way ANOVA's and t-tests were conducted to check if there were any significant differences between groups.

Results

To answer the three proposed research questions, namely if there is a significant difference in perceived emotionality, attitude towards the issue and behavioural intention as a function of language (Dutch and English) and appeal (informational, positive emotional, negative emotional) in meat reduction advertisements, a two-way MANOVA was conducted. The analysis did not demonstrate a significant result ($F(6, 282) = 1.26, p = .274$).

Influence of Message Appeal and Language on Perceived Emotionality

A follow-up two-way ANOVA for perceived emotionality with language and message appeal as independent variables was used to investigate whether meat reduction advertisements with an emotional appeal were perceived as more emotionally charged in L1 than in L2, and to explore if meat reduction ads with an informational appeal were perceived as less emotionally charged than ads with an emotional appeal, both in L1 as in L2. The ANOVA revealed a significant effect of message appeal on perceived emotionality ($F(2, 143) = 10.26, p < .001$). Neither a significant effect for language ($F(1, 143) = 2.30, p = .132$), nor an interaction effect between language and message appeal ($F(2, 143) < 1$) was found. Hence, message appeal did appear to have an influence on perceived emotionality, but language did not reveal to affect. Dutch emotional advertisements were thus not perceived as more emotionally charged than English emotional advertisements. The condition means for language and message appeal on perceived emotionality are presented in Table 1.

Table 1. Number of participants, means and standard deviations of the dependent variable perceived emotionality with message appeal and language as factors, measured on a 5-point scale of strongly disagree (1) – strongly agree (5).

Language	Appeal	Perceived emotionality	
		<i>N</i>	<i>M (SD)</i>
Dutch	Informational	31	2.29 (1.01)
	Positive emotional	29	2.34 (.82)
	Negative emotional	22	3.14 (1.17)
	Total	82	2.54 (1.05)
English	Informational	24	2.33 (1.40)

Positive emotional	20	2.80 (1.40)
Negative emotional	23	3.48 (.90)
Total	67	2.87 (1.33)
Total	149	2.68 (1.19)

Several post hoc tests were conducted to investigate where the significant differences in perceived emotionality caused by message appeal between groups occurred. The means are presented in Table 2. An independent t-test on perceived emotionality with message appeal as factor (informational, negative emotional) revealed a significant difference ($t(97.475) = 4.50, p < .001$). Informational meat reduction ads ($M = 2.31, SD = 1.18$) were perceived as less emotional than meat reduction ads with a negative appeal ($M = 3.31, SD = 1.04$). Another independent t-test on perceived emotionality with message appeal as factor (positive emotional, negative emotional) revealed a significant difference ($t(92) = 3.52, p = .001$) between the two groups. Meat reduction ads with a positive emotional appeal ($M = 2.53, SD = 1.10$) were perceived as less emotional than meat reduction ads with a negative emotional appeal ($M = 3.31, SD = 1.04$). The independent t-test on perceived emotionality with message appeal as factor (informational, positive emotional) did not illustrate a significant difference ($t(102) = .98, p = .327$). Informational meat reduction ads ($M = 2.31, SD = 1.18$) were not perceived as significantly less emotional than meat reduction ads with a positive emotional appeal ($M = 2.53, SD = 1.10$). Accordingly, informational meat reduction ads were perceived as less emotional than negative meat reduction ads, but not less emotional than positive meat reduction ads, regardless of the used language.

Table 2. Number of participants, means and standard deviations of the dependent variable perceived emotionality with message appeal as factor, measured on a 5-point scale of strongly disagree (1) – strongly agree (5).

Appeal	<i>N</i>	<i>M (SD)</i>
Informative	55	2.31 (1.18)
Positive emotional	49	2.53 (1.10)
Negative emotional	45	3.31 (1.04)

Total	149	2.68 (1.19)
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Influence of Message Appeal and Language on Persuasiveness

A two-way ANOVA was used to follow-up the MANOVA, to investigate if meat reduction ads were more persuasive when presented in L1 than in L2. The two-way ANOVA for attitude towards the issue, with language and message appeal as factors, did not reveal a significant effect of message appeal ($F(2, 143) = 1.62, p = .202$), neither an effect of language ($F(1, 143) < 1$), nor an interaction effect of language and message appeal ($F(2, 143) = 2, p = .140$). The condition means for attitude towards the issue are presented in Table 3 and 4.

Table 3. Number of participants, means and standard deviations of the dependent variable attitude towards the issue with message appeal and language as factors, measured on a 5-point scale of strongly disagree (1) – strongly agree (5).

Language	Appeal	<i>N</i>	<i>M (SD)</i>
Dutch	Informational	31	2.68 (1.17)
	Positive emotional	29	2.97 (.91)
	Negative emotional	22	3.00 (1.07)
	Total	82	2.87 (1.05)
English	Informational	24	3.04 (1.16)
	Positive emotional	20	3.40 (1.14)
	Negative emotional	23	2.61 (1.20)
	Total	67	3.00 (1.19)
Total		149	2.93 (1.12)

Table 4. Number of participants, means and standard deviations of the dependent variable attitude towards the issue with message appeal as factor, measured on a 7-point Likert scale of strongly disagree (1) – strongly agree (7).

Appeal	<i>N</i>	<i>M (SD)</i>
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Informative	55	2.84 (1.17)
Positive emotional	49	3.14 (1.02)
Negative emotional	45	2.80 (1.14)
Total	149	2.93 (1.12)

For the dependent variable behavioural intention, a two-way ANOVA was conducted, with language and message appeal as factors. There was no significant effect found for message appeal ($F(2, 143) < 1$) and language ($F(1, 143) < 1$). An interaction effect of language and message appeal was also not found ($F(2, 143) = 1.87, p = .157$). Language and message appeal did thus not appear to cause any significant differences in attitude towards the issue and intention to engage in behavioural change. Hence, emotional meat reduction ads were not apparently more persuasive in L1 than in L2, regardless of the valence of the emotion. Moreover, informational meat reduction ads did not turn out to have a greater persuasive impact in L2 than in L1. The condition means for behavioural intention are presented in Table 5 and 6.

Table 5. Number of participants, means and standard deviations of the dependent variable behavioural intention with message appeal and language as factors, measured on a 7-point Likert scale of strongly disagree (1) – strongly agree (7).

Language	Appeal	<i>N</i>	<i>M (SD)</i>
Dutch	Informational	31	2.73 (1.28)
	Positive emotional	29	3.22 (1.21)
	Negative emotional	22	3.31 (1.40)
	Total	82	3.06 (1.30)
English	Informational	24	3.34 (1.39)
	Positive emotional	20	3.44 (1.53)
	Negative emotional	23	2.88 (1.30)
	Total	67	3.21 (1.40)

Total	149	3.13 (1.34)
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Table 6. Number of participants, means and standard deviations of the dependent variable behavioural intention with message appeal as factor, measured on a 7-point Likert scale of strongly disagree (1) – strongly agree (7).

Appeal	<i>N</i>	<i>M (SD)</i>
Informative	55	3.00 (1.35)
Positive emotional	49	3.31 (1.34)
Negative emotional	45	3.09 (1.35)
Total	149	3.13 (1.34)

Influence of Valence of Emotional Appeal on Persuasiveness

To find out if meat reduction advertisements were more persuasive when a negative appeal was used than when a positive emotional appeal was used, an independent samples t-test was conducted. The t-test for attitude towards the issue for positive emotional appeal ($M = 3.14$, $SD = 1.02$) and negative emotional appeal ($M = 2.80$, $SD = 1.14$) did not demonstrate a significant difference in attitude towards the issue between positive emotional ads and negative emotional ads ($t(88.60) = 1.53$, $p = .129$). An independent t-test on behavioural intention with emotional message appeal as factor did also not uncover a significant difference between positive emotional ($M = 3.31$, $SD = 1.34$) and negative emotional ads ($M = 3.09$, $SD = 1.35$) ($t(91.16) = .80$, $p = .426$). Hence, the type of emotional appeal of the advertisement did not appear to cause any significant differences for attitude towards the issue, nor behavioural intention. Meat reduction ads with a negative appeal did thus not appear to be more persuasive than meat reduction ads with a positive appeal.

Discussion

The present study explored the influence of first and second language use and informational and emotional message appeals on the effectiveness of meat reduction advertisements. Dutch students took part in a questionnaire where they saw one of the six manipulated advertisements and afterwards rated their perceived emotionality, attitude towards the issue and behavioural intention.

The first addressed research question of the present study was on the influence of language (L1 and L2) and message appeal (informational, positive, and negative) on the perceived emotionality of the ads. The results illustrated that there were significant differences in perceived emotionality that were caused by message appeal, but no significant differences for language, nor an interaction effect of language and message appeal. Hence, the first hypothesis cannot be confirmed: meat reduction ads with an emotional appeal (whether positive or negative) were not perceived as more emotionally charged in L1 than in L2. The second hypothesis can be partly confirmed: informational appeals were perceived as less emotionally charged than negative emotional ads, but not less than positive emotional ads. While message appeal partly showed the expected effect on perceived emotionality, the lack of an effect of language is incongruent with the study of Caldwell-Harris and Aycicegi-Dinn (2016). They described the presence of a feeling of reduced emotionality experienced by bilingual speakers in foreign language use. Puntoni et al. (2009) found a similar pattern in their study, namely that L1 messages tend to be perceived as more emotional than L2 messages. This is contradictory with the findings of the present study.

The second addressed research question of this study was on the influence of language and message appeals on the persuasiveness of meat reduction advertisements. Results did not show any significant differences in attitude towards the issue, nor in behavioural intention that were caused by language, message appeal or by the interaction of language and message appeal. Consequently, H3 has been rejected: meat reduction ads with an emotional appeal (whether positive or negative) did not lead to a more positive attitude towards the issue and a greater intention to engage in behavioural change when presented in L1 rather than L2. H4 has also been rejected: meat reduction ads with an informational appeal did not lead to a more positive attitude towards the issue and a greater intention to engage in behavioural change when presented in L2 than L1. These results are incongruent with the study of Noble et al. (2014), in which emotional appeals did influence attitude towards the issue and behavioural intention. According to the foreign language effect, proposed by Keysar et al. (2012) and tested by Pavlenko (2012), it was expected that the use of L2 would reduce decision biases,

like emotionality, and would therefore be less effective than L1 ads, as building emotional experiences is essential for effective marketing messages (Puntoni et al., 2009).

Lastly, the influence of the valence of the emotional appeal on persuasiveness, namely attitude towards the issue and behavioural intention, has been researched in this study. The results were not significant: positive emotional advertisements were not more persuasive than negative emotional advertisements, neither in L1 nor in L2. Therefore, H5 has also been rejected: meat reduction ads did not lead to a more positive attitude towards the issue and a greater intention to engage in behavioural change when a negative emotional appeal is used than when a positive emotional appeal is used, neither in L1 nor in L2. This finding is inconsistent with the study of Noble et al. (2014), who found that negative ads were more persuasive than positive ones.

While the results differ from similar studies on the foreign language effect and emotional appeals in social advertising, the lack of confirmation of hypotheses has some possible explanations. In this research, meat reduction advertisements were manipulated, which is a topic of so-called pro-environmental social advertising. As much research on the topic of meat reduction has been done (e.g., Aiking, 2011; Hartmann & Siegrist, 2017; Tukker & Jansen, 2006), it is assumable that the issue of meat reduction is also a well-known and familiar topic of the participants. Potentially, a large part of Dutch citizens already know that meat consumption often goes hand in hand with animal cruelty, as it is a topic that has received much media attention over the past years. Hence, neither the angle (animal cruelty) nor the topic (reduction of meat consumption) is new or original to the participants. It is plausible that attitude and behavioural intention change is more difficult when attitudes and intentions are already formed. Accordingly, it is explainable that the message appeal of the advertisement did not show an effect on the attitude towards the issue and behavioural intention of participants, as the present stimuli were not new. It may be helpful for further studies to include prior issue involvement as a variable. According to Lewis (2008), prior issue involvement can influence the ad's effectiveness, especially in social advertising (Noble et al., 2014).

Furthermore, many factors can influence the presence of the foreign language effect, such as age and context of learning (Dewaele, 2004; Dewaele & Palgrave, 2010; Pavlenko, 2012). As the participants of this experiment were Dutch students, who are a group of highly proficient English speakers (Eurobarometer, 2012), it is possible that the foreign language effect did not occur. In addition, results of the present study showed that the participants had a high emotional grounding in their L2, which certifies this idea. According to Caldwell-Harris

and Aycicegi-Dinn (2016) and Degner et al. (2012), frequent usage and high proficiency of an L2 can even cause an opposite effect and make the foreign language feel more emotional than an L1. Correspondingly, the average score of self-reported English reading proficiency confirms the high proficiency of the participants of this study. However, the frequency of L2 use was not measured in the present study, which may be interesting for further research.

The failure to confirm the stated hypotheses can also be explained by several limitations of this study. As the manipulated advertisements, both the Dutch, English and the informational and emotional versions, were not pretested on the strength and valence of the emotionality, the ads may not have been successful in eliciting the right emotional responses. Consequently, this could be an explanation of the limited differences in perceived emotionality, attitude towards the issue and behavioural intention caused by the message appeals. A pre-test of advertisements, as was done in the study by Noble et al. (2014) is recommended for a similar study in the future, to check whether the message appeals are indeed successful in eliciting the intended emotional responses. Moreover, the manipulated ads were rather short, as they consisted of five sentences each. A longer message may cause more differences in persuasiveness. As it costs more time to process more text, participants may possibly have shown a stronger reaction to presented stimuli if the ads were longer. However, an advertisement that consists of more text is presumably less common with real-world practices and therefore not ideal for the validity of the study.

The size and the population from which the sample was derived were also a limitation of this study. Some analysis revealed an almost significant result, which demonstrates that the researchers were slightly underpowered in terms of sample size. While the sample of this study was not exceptionally small, a larger number of participants could have led to the revelation of other significant effects. Unfortunately, a bigger sample was not attainable for the researchers. In addition, the group of participants only consisted of Dutch students and is therefore not generalizable to the whole Dutch population. It is not unlikely that older age groups would score differently on perceived emotionality, attitude towards the issue and behavioural intention, as they may have a lower proficiency and a less frequent usage of English than students. On top of that, as Dutch citizens are one of the most proficient in English, compared to other countries in the European Union (Eurobarometer, 2012), native speakers of other languages should be investigated as well, to see whether differences in proficiency among groups also causes differences in perceived emotionality and persuasiveness.

Lastly and perhaps most importantly, the present study only tested the effect of the advertisement after one single exposure. As Bozinoff and Ghingold (1983) state, multiple exposures to an advertisement, preferably over a longer period, may cause more significant effects on attitude towards the issue and behavioural intention. On top of that, multiple exposures are more equivalent to real-world practices. A longitudinal study is therefore expected to be much more effective and desirable in testing the persuasiveness of an ad.

Overall, further research should thus consist of a longitudinal study, in which advertisements ideally contain more text. Additionally, the foreign language effect should be investigated among different groups, not only high-proficient Dutch students. To find out if the foreign language effect occurs in social advertisements, preferably, an unestablished topic of pro-environmental social advertising should be used. In this way, it can be investigated if it is possible to have more influence on the attitude towards the issue and behavioural intention when these are not formed yet.

Since the present study did not find an effect of language and message appeal on persuasiveness, more research should be done to discover if the use of language and message appeals can be used to make meat reduction ads more persuasive. The reduction of meat consumption will expectedly be an important topic in the upcoming years, and advertisements are expected to be shown even less often in the mother tongue of the consumer, as marketing experts will increasingly use foreign languages in their advertising messages (Puntoni et al., 2009). Investigating how meat reduction ads, and social advertisements in general, can be made more effective is therefore valuable. It can help to bring effective change in individual behaviour to reach important social goals, such as reducing meat consumption, and consequently, limit the human impact on climate change.

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Appendix A. Dutch Versions of the Manipulated Advertisements

Figure 5. Dutch informational advertisement

In Nederland worden dagelijks 1,7 miljoen dieren geconsumeerd. Dit omvat koeien, kippen en varkens.

De consumptie van vlees wordt geassocieerd met een verminderd dierenwelzijn. De gemiddelde Nederlander eet ongeveer 77 kg vlees per jaar. Deze consumptie stijgt voortdurend, maar jij kunt helpen dit aantal omlaag te brengen.

Ga jij je vleesconsumptie verminderen of niet?

Figure 6. Dutch negative advertisement

In Nederland worden dagelijks 1,7 miljoen dieren geconsumeerd. Dit omvat koeien, kippen en varkens.

Jouw vleesconsumptie draagt bij aan de uitbuiting en slachting van onschuldige dieren. Het aantal doden en de gruwelijkheid in deze industrie neemt voortdurend toe en we zijn allemaal verantwoordelijk daarvoor.

Is de smaak van vlees het waard om bloed aan je handen te hebben?

Figure 7. Dutch positive advertisement

In Nederland worden dagelijks 1,7 miljoen dieren geconsumeerd. Dit omvat koeien, kippen en varkens.

Door simpelweg minder vlees te eten, kan je deze dieren een kans geven om het lange en gelukkige leven te leiden dat ze verdienen.

We kunnen allemaal een rol spelen bij het stoppen van de constante toename van de consumptie van dieren.

Word jij een held en red je deze dieren?

Appendix B. Dutch and English Version of the Questionnaire

English Version

Welcome to the survey.

Dear participant,

Thank you for participating in our study. This questionnaire is part of the International Business Communication Bachelor's programme at Radboud University. This one-time survey, consisting of 13 questions, will take approximately 5 minutes to finish. We are conducting research on social advertisements in society. In order to do so, Dutch native speakers are needed.

All the obtained data will be confidential and will only be available to the researchers conducting this questionnaire. Your participation is completely anonymous and voluntary. You can withdraw from this questionnaire at any given point.

If you have any questions or complaints about this study, please send an e-mail to annabel.schwarz@student.ru.nl.

By filling out this form, you declare that you have been sufficiently informed about the study and that you want to voluntarily participate.

Thank you for your time,

Frances van Drogenbroek, Isi Omole, Annabel Schwarz, Bente Nijkamp, Fleur de Jong, Mees Bartholomeus, and Nguyễn Lương.

By selecting "I agree" you are consenting to the conditions as described above.

- I agree
- I disagree

Are you a student?

- Yes
- No

Are you above the age of eighteen?

- Yes
- No

What is your age?

Which gender do you identify as?

- Male
- Female
- Non-binary/other
- Prefer not to say

What is your current educational level?

- MBO
- HBO
- University (Bachelors)
- University (Masters)
- PhD
- Other

Eating habits

How many days a week do you eat meat?

- Never (0)
- Once per week
- Twice per week
- 3 times a week
- 4 times a week
- 5 times a week
- 6 or more time a week

Below you will see an advertisement. The next questions in the questionnaire will be about this ad. Take your time to read it carefully as you will not be able to go back once you

proceed.

Please answer this question on the basis of the previously viewed advertisement

Because of the ad I would be concerned about eating less meat

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

Please answer this question on the basis of the previously viewed advertisement

Because of this ad, I intend to cut the number of meals with meat to half

Because of this ad, I intend to refrain from eating meat

Because of this ad, I intend to replace meat with meat substitutes, vegetables or beans

Because of this ad, I intend to eat vegetarian food twice as often as today

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

Please answer this question on the basis of the previously viewed advertisement

I think this ad is emotional

- Strongly agree,
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

Proficiency

I consider my English reading proficiency as

- Very poor
- Poor
- Below average
- Average
- Good
- Very good
- Excellent

What is your native language (the language in which you were raised from birth)?

- Dutch
- Dutch plus another language
- Other

At what age did you start learning English? (For example at school or at home)

- Before age 5
- At age 5 or later
- I've never learned English

If you experienced any technical difficulties or have any comments about the study that you would like to share, please let us know here.

Dutch version

Welkom bij deze enquête.

Beste deelnemer,

Bedankt voor het bijdragen aan onze studie. Deze vragenlijst is deel van de studie Communicatie- en Informatiewetenschappen aan de Radboud Universiteit. Deze eenmalige enquête, bestaande uit 13 vragen, zal ongeveer 5 minuten duren. Dit onderzoek betreft sociale advertenties in de maatschappij. Hiervoor zijn mensen met Nederlands als moedertaal nodig.

Alle verkregen gegevens worden als vertrouwelijk behandeld en zijn alleen beschikbaar voor de onderzoekers. Jouw bijdrage in deze studie is compleet anoniem en op vrijwillige basis. Je kunt stoppen op ieder gewenst moment.

Mocht je vragen of opmerkingen hebben betreffende dit onderzoek, kun je deze mailen naar: annabel.schwarz@student.ru.nl

Door het invullen van deze enquête verklaar je voldoende ingelicht te zijn over dit onderzoek en vrijwillig deel te nemen.

Bedankt voor je tijd,

Frances van Drogenbroek, Isi Omole, Annabel Schwarz, Bente Nijkamp, Fleur de Jong, Mees Bartholomeus en Nguyễn Lương.

Door "Ik stem toe" te selecteren ga je akkoord met de voorwaarden als hierboven omschreven.

- Ik stem toe
- Ik stem niet toe

Ben je student?

- Ja

- Nee

Ben je 18 jaar of ouder?

- Ja
- Nee

Wat is je leeftijd?

Waarmee identificeer je jezelf?

- Man
- Vrouw
- Non-binair/anders
- Wil ik liever niet zeggen

Wat is je huidige opleidingsniveau?

- MBO
- HBO
- Universiteit (Bachelor)
- Universiteit (Master)
- PhD
- Anders

Eetgewoontes

Hoe vaak per week eet je vlees?

- Nooit (0)
- 1 keer per week
- 2 keer per week
- 3 keer per week
- 4 keer per week
- 5 keer per week
- Dagelijks

Hieronder zie je een advertentie. De volgende vragen in de vragenlijst gaan over deze advertentie. Neem de tijd om het aandachtig door te lezen, want je kan niet meer teruggaan als je eenmaal doorklikt.

Beantwoord deze vraag alsjeblieft op basis van de advertentie die je hiervoor hebt gezien

Door deze advertentie zou ik me interesseren in het eten van minder vlees

- Helemaal mee eens
- Mee eens
- Niet mee eens en niet mee oneens
- Mee oneens
- Helemaal mee oneens

Please answer this question on the basis of the previously viewed advertisement

Door deze advertentie ben ik van plan om mijn aantal maaltijden met vlees te halveren

Door deze advertentie ben ik van plan om af te zien van het eten van vlees

Door deze advertentie ben ik van plan om vlees te vervangen door vleesvervangers, groenten of bonen

Door deze advertentie ben ik van plan om vanaf vandaag twee keer zo vaak vegetarisch te eten

- Helemaal mee eens
- Mee eens
- Een beetje mee eens
- Niet mee eens en niet mee oneens
- Een beetje mee oneens
- Mee oneens
- Helemaal mee oneens

Beantwoord deze vraag alsjeblieft op basis van de advertentie die je hiervoor hebt gezien

Ik vind deze advertentie emotioneel

- Helemaal mee eens
- Mee eens
- Een beetje mee eens
- Niet mee eens en niet mee oneens

- Een beetje mee oneens
- Mee oneens
- Helemaal mee oneens

Bekwaamheid

Ik beschouw mijn Engelse leesvaardigheid als...

- Erg slecht
- Slecht
- Ondergemiddeld
- Gemiddeld
- Goed
- Heel goed
- Uitstekend

Wat is je moedertaal? (De taal waarmee je opgevoed bent vanaf je geboorte)

- Nederlands
- Nederlands plus andere taal
- Anders

Op welke leeftijd ben je begonnen met Engels leren? (Bijvoorbeeld op school of thuis)

- Voor de leeftijd van 5 jaar
- Op de leeftijd van 5 jaar of later
- Ik heb nooit Engels geleerd

Als je technische problemen hebt ondervonden of opmerkingen hebt over het onderzoek die je zou willen delen, laat het ons dan hier weten.

Appendix C. Checklist EACH (version 1.6, november 2020)

1. Is a health care institution involved in the research?

Explanation: A health care institution is involved if one of the following (A/B/C) is the case:

- A. One or more employees of a health care institution is/are involved in the research as principle or in the carrying out or execution of the research.
- B. The research takes place within the walls of the health care institution and should, following the nature of the research, generally not be carried out outside the institution.
- C. Patients / clients of the health care institution participate in the research (in the form of treatment).

No → continue with questionnaire

Yes → Did a Dutch Medical Institutional Review Board (MIRB) decide that the Wet Medisch Onderzoek (Medical Research Involving Human Subjects Act) is not applicable?

Yes → continue with questionnaire

No → This application should be reviewed by a Medical Institutional Review Board, for example, the Dutch CMO Regio Arnhem Nijmegen → end of checklist

2. Do grant providers wish the protocol to be assessed by a recognised MIRB?

No → continue with questionnaire

Yes → This application should be reviewed by a Medical Institutional Review Board, for example, the Dutch CMO Regio Arnhem Nijmegen → end of checklist

3. Does the research include medical-scientific research that might carry risks for the participant? No → continue with questionnaire

Yes → This application should be reviewed by a Medical Institutional Review Board, for example, the Dutch CMO Regio Arnhem Nijmegen → end of checklist

Standard Research Method

4. Does this research fall under one of the stated standard research methods of the Faculty of Arts or the Faculty of Philosophy, Theology and Religious Studies?

Yes → Standard evaluation and attitude research (1)→ continue with questionnaire

No → assessment necessary, end of checklist

Participants

5. Is the participant population a healthy one?

Yes → continue with questionnaire

No → assessment necessary, end of checklist → go to assessment procedure

6. Will the research be conducted amongst minors (<16 years of age) or amongst (legally) incapable persons?

Yes → assessment necessary, end of checklist → go to assessment procedure

No → continue with questionnaire

Method

7. Is a method used that makes it possible to produce a coincidental finding that the participant should be informed of?

Yes → assessment necessary, end of checklist → go to assessment procedure

No → continue with questionnaire

8. Will participants undergo treatment or are they asked to perform certain behaviours that can lead to discomfort?

Yes → assessment necessary, end of checklist → go to assessment procedure

No → continue with questionnaire

9. Are the estimated risks connected to the research minimal?

- No → assessment necessary, end of checklist → go to assessment procedure
- Yes → continue with questionnaire

10. Are the participants offered a different compensation than the usual one?

- Yes → assessment necessary, end of checklist → go to assessment procedure
- No → continue with questionnaire

11. Should deception take place, does the procedure meet the standard requirements?

- No → assessment necessary, end of checklist → go to assessment procedure
- Yes → continue with questionnaire

12. Are the standard regulations regarding anonymity and privacy met?

- No → assessment necessary, end of checklist → go to assessment procedure
- Yes → continue with questionnaire

Conducting the Research

13. Will the research be carried out at an external location (such as a school, hospital)?

- No → continue with questionnaire
- Yes → Do you have/will you receive written permission from this institution?

No → assessment necessary, end of checklist → go to assessment procedure

- Yes → continue with questionnaire

14. Is there a contact person to whom participants can turn to with questions regarding the research and are they informed of this?

- No → assessment necessary, end of checklist → go to assessment procedure
- Yes → continue with questionnaire

15. Is it clear for participants where they can file complaints with regard to participating in the research and how these complaints will be dealt with?

- No → assessment necessary, end of checklist → go to assessment procedure
- Yes → continue with questionnaire

16. Are the participants free to participate in the research, and to stop at any given point, whenever and for whatever reason they should wish to do so?

- No → assessment necessary, end of checklist → go to assessment procedure
- Yes → continue with questionnaire

17. Before participating, are participants informed by means of an information document about the aim, nature and risks and objections of the study? (zie explanation on informed consent and sample documents).

- No → assessment necessary, end of checklist → go to assessment procedure
- Yes → continue with questionnaire

18. Do participants and/or their representatives sign a consent form? (zie explanation on informed consent and sample documents).

- No → assessment necessary, end of checklist → go to assessment procedure
- Yes → checklist finished

Appendix D. Statement of Own Work

Student name: Frances van Drogenbroek

Student number: s1022811

PLAGIARISM is the presentation by a student of an assignment or piece of work which has in fact been copied in whole or in part from another student's work, or from any other source (e.g., published books or periodicals or material from Internet sites), without due acknowledgement in the text.

DECLARATION:

- a. I hereby declare that I am familiar with the faculty manual (<https://www.ru.nl/facultyofarts/stip/rules-guidelines/rules/fraud-plagiarism/>) and with Article 16 "Fraud and plagiarism" in the Education and Examination Regulations for the Bachelor's programme of Communication and Information Studies.
- b. I also declare that I have only submitted text written in my own words
- c. I certify that this thesis is my own work and that I have acknowledged all material and sources used in its preparation, whether they be books, articles, reports, lecture notes, and any other kind of document, electronic or personal communication.

Signature: 

Place and date: Nijmegen, 07-06-2021