

Bachelor's Thesis

**Does a Foreign Language Influence the Emotionality and Effectiveness of Traffic Safety
Campaigns?**

Johanna Ebben

Supervisor: Dr. Felker, E.R.

June 9th, 2023

Word Count: 7692

Abstract

The widespread use of English across the globe has given rise to the question of whether public safety campaigns can be globalized using English and be equally effective as localized campaigns. The aim of the present study was to investigate whether persuasive messages in a native language arouse more emotions than in a foreign language and whether fear or sadness appeals are more effective in persuasive traffic safety communication. In an experiment, 174 native German participants rated their emotionality after exposure to a persuasive poster concerning texting while driving and were asked about their attitudes and behavioural intentions. Findings showed that neither language nor type of appeal influenced emotionality, attitudes, or behavioural intentions. This suggests that a native language does not necessarily always arouse more emotions than a foreign language and thus globalization of such campaigns may be efficient. Furthermore, the findings imply that multiple appeal types can be equally effective. However, conclusions must be drawn with caution since general low emotionality of participants is likely to have impacted the results.

Keywords: disembodied cognition, emotional blunting, native vs foreign language, emotionality, persuasion, traffic safety communication, texting while driving

Introduction

Traffic safety, specifically the issue of texting while driving (TWD), has gained great research attention with the increase in mobile phone usage (Cismaru, 2014). Research has shown that TWD leads to a strongly increased crash risk (e.g. Dingus et al., 2006; Victor et al., 2014). Consequently, persuasive communication is employed to initiate attitude change and eventually cause behavioural change concerning TWD (Cismaru, 2014).

To be effective, campaigns often include emotional appeals to persuade the public to refrain from TWD, especially fear appeals are frequently employed (Cismaru, 2014). Fear appeals are characterized by stressing the harmful, sometimes even fatal, consequences of dangerous actions or behaviours (Tannenbaum et al., 2015). Whereas fear appeals are frequently used and discussed, sadness appeals have not been studied in the field of traffic safety communication. Sadness appeals are characterized by evoking feelings of separation, loss, and failure (Zheng, 2020). The present study aims to compare the effectiveness of fear and sadness appeals.

Due to the widespread use of English in print advertising in European countries such as Germany, Spain, and the Netherlands (Gerritsen et al., 2007) it becomes relevant to present public safety messages in English as globalized campaigns. Hilgendorf (2007) set up a qualitative, macrosociolinguistic profile of the impact of English in Germany and found that English is prevalent in domains such as politics, law, business, advertising, science, research, and popular music. Given the widespread use of English in Germany, it is of societal relevance to investigate the effectiveness of English public safety messages in Germany, which the present experiment is designed to do.

Evidently, the use of English in persuasive campaigns may be problematic as research has shown that automatic affective processing and emotional arousal may be weaker in a foreign language (FL) than in a native language (L1) (e.g., Caldwell-Harris & Aycicegi-Dinn, 2016; Pavlenko, 2012). For instance, marketing messages in an L1 generally arouse more emotions in multilinguals than messages in an FL (Puntoni, de Langhe, & van Osselaer, 2009). This effect has been referred to as ‘disembodied cognition’ (Pavlenko, 2012) or ‘emotional blunting’ (Caldwell-Harris & Aycicegi-Dinn, 2016) which may negatively influence the effectiveness of persuasive communication, as employed emotional appeals may be less powerful in an FL (e.g. Jorgensen, 1996; Petty & Briñol, 2014).

The present study aims to provide insights into the effectiveness of traffic safety campaigns in an FL compared to an L1 for the purpose of promoting public safety. Moreover, this research aims to add to the literature on disembodied cognition and persuasion and

addresses the research gap of emotional blunting in persuasive public safety communication. Additionally, this study intends to provide new insights into the effectiveness of fear compared to sadness appeals in traffic safety communication. Especially sadness appeals have had little research attention and it is not yet clear whether fear or sadness appeals are more effective in traffic safety communication.

The following literature review will present the scientific insights on which this study is based, namely theories on disembodied cognition, theoretical frameworks linking emotion and persuasion, scientific insights on different emotional appeals in persuasive communication, and traffic safety literature.

Research on Disembodied Cognition

Pavlenko (2012) highlights the importance of clearly defining terms related to bilingualism to be able to distinguish between different populations. Bilinguals and multilinguals are defined as ‘speakers who use two or more languages or dialects in their everyday lives, regardless of their levels of proficiency in the respective languages’ (Pavlenko, 2012, p. 407). The present study investigates disembodied cognition in late or adult bilinguals, who acquired a second language (L2) after the age of six. Simultaneous bilinguals, ‘speakers who acquired two or more languages from birth’, are purposely excluded as both languages may trigger similar levels of emotional resonance due to the early age and context of acquisition (Pavlenko, 2012, p. 411). The present study aims to investigate disembodied cognition in bilinguals who learned English as an FL, meaning that English was acquired in a classroom. This is important as the context of language acquisition influences the emotionality of a language; languages learned in a naturalistic context are more emotional (Pavlenko, 2012, p. 411).

Neuroimaging approaches suggest individuals take longer to access words in an L2 in their mental lexicon; consequently, affective processing may be less automatic (Pavlenko, 2012). However, introspective approaches studying disembodied cognition revealed four main factors moderating emotional arousal: order of acquisition, language dominance, age of acquisition, and context of acquisition (Pavlenko, 2012). Thus, emotional blunting is more complex than a straightforward claim that an L1 is always more emotional than an FL. However, in the context of traffic safety communication, it can be expected that an L1 elicits greater emotionality than an FL as the topical domain includes words closely connected to experiences in the L1 such as words in the field of driving, family, and death.

Puntoni, de Langhe, and van Osselaer (2009) conducted an experiment investigating emotional blunting in advertising and propose a language-specific episodic trace theory of language emotionality. This proposal is based on episodic trace models of memory from cognitive psychology (Raaijmakers & Shiffrin, 1992) which posit that every experience leaves a separate episodic trace in memory containing perceptual and contextual details, which later influence the emotional experience of new stimuli which are similar to the previous experience.

In their experiment, Puntoni, de Langhe, and van Osselaer (2009) exposed bilingual participants to marketing slogans in their L1 or L2. They found that marketing messages in an L1 were generally evaluated as more emotional than messages in an FL. By conducting several experiments, the researchers ruled out explanations based on country stereotypes and comprehension effects. Puntoni, de Langhe, and van Osselaer (2009) found that perceived emotionality ‘depends on the frequency with which words have been experienced in native-versus second-language contexts’.

Additionally, Caldwell-Harris and Aycicegi-Dinn (2016) suggest that advertisers should consider several factors when deciding on the language of advertisements targeted at bilinguals, such as type of product and the language context that bilinguals connect with a product, as bilingual ads could be effective if the language switches in congruence with the emotional language context.

In summary, messages formulated in an FL lead to disembodied cognition which may affect persuasive communication.

Theoretical Frameworks Linking Emotion and Persuasion

Persuasion can be defined as attempting to change attitudes by providing information about an issue (Petty & Briñol, 2014). Attitudes are learned tendencies to always respond positively or negatively to a particular object (Fishbein & Ajzen, 1975).

Reduced emotionality due to disembodied cognition may reduce the effectiveness of persuasive communication in an FL, since persuasive messages are more effective when a receiver’s emotions are aroused (Arnold, 1985). Additionally, emotions have been shown to change opinions and strengthen existing attitudes (Lulofs, 1991).

Petty and Cacioppo’s (1986) Elaboration Likelihood Model (ELM) theorizes the processing of persuasive messages and the role of emotions in the process. The core of the model is: ‘argument elaboration mediates the route to persuasion’ (Jorgensen, 1996, p. 409). Emotional appeals are categorized as peripheral cues, superficial processing factors (Jorgensen, 1996), which are most effective when the does not process the cognitive aspects of a message

(Jorgensen, 1996). According to the ELM there are ‘four ways in which emotions can influence attitudes by impacting primary cognition’ (Petty & Briñol, 2014, p. 3). Firstly, emotions can serve as simple cues when elaboration is low. Secondly, emotions can serve as arguments when elaboration is high. Thirdly, emotions can bias cognition when elaboration is high and lastly, emotions can influence the amount of thinking when elaboration is unconstrained. Emotions can thus influence the persuasiveness of a message in many ways.

In a realistic setting, drivers would process the message designed for this study largely peripherally as the message would be depicted on a highway billboard which they would quickly pass. However, as subjects in this study will have unlimited time to think about the message and will be asked to evaluate it, elaboration may be high, and the aroused emotion may serve as an argument. If due to disembodied cognition in an FL the emotional arousal is weakened, it may also weaken the effect of emotion as an argument and thus decrease the effectiveness of the message.

In summary, emotional appeals and emotional arousal play a significant role in persuasive communication and its effectiveness. Due to disembodied cognition, an FL may be less emotional than an L1, decreasing the effectiveness of persuasive messages in an FL. In this study, the effectiveness of the message will be evaluated in terms of emotionality, attitudes, and behavioural intentions.

Emotional Appeals in Persuasive Communication

Fear appeals are frequently employed in persuasive communication, though their effectiveness is often debated among scholars (Tannenbaum et al., 2015). Tannenbaum et al. (2015) conducted the largest meta-analysis on the effectiveness of fear appeals to date. The researchers found that fear appeals have a positive effect on attitude, intentions, and behaviour and that there is no evidence that fear appeals backfire. Moreover, the effectiveness of fear appeals can be increased by including efficacy statements, as well as by depicting high susceptibility and severity (Tannenbaum et al., 2015). This study tests whether fear appeals will be more or less effective than sadness appeals in influencing attitudes and behavioural intentions regarding TWD and whether they will be more or less effective in an L1 versus an FL.

Besides fear, sadness is a common negative emotion in advertisements (Zheng, 2020). In advertising, sadness appeals have been shown to generate emotional immersion and empathy which has been suggested to make an audience more likely to take action (Zheng, 2020). Biener, McCallum-Keeler, and Nyman (2000) showed that anti-tobacco advertisements

eliciting strong feelings of sadness and fear were considered most effective by respondents. However, the researchers did not differentiate and compare the two emotional appeals, which the present study aims to do.

According to the valence and arousal emotion model (Russell, 1980), fear has negative valence and high arousal, whereas sadness has negative valence and low arousal. This makes the two negatively valenced emotions a relevant combination to contrast in the context of emotional blunting in persuasive communication as differing levels of arousal between the two emotions may influence the perceived emotional state of the viewer as influenced by the message, as well as the effectiveness of the message. This is hypothesized as greater emotional arousal has been connected to greater effectiveness of persuasive communication (Arnold, 1985). If arousal is low, viewers may falsely underestimate the strength of their emotional state and in turn, also misinterpret how much the message has affected them. Consequently, if subjects perceive a fear appeal as more emotional than a sadness appeal, a fear appeal may be more effective in influencing attitude and behavioural intentions in persuasive communication. Additionally, the high arousal of the fear appeal may increase the emotional blunting effect as when general emotional arousal is high, differences between emotionality caused by language are likely to be greater.

Traffic Safety Communication

Persuasive communication aimed at convincing the public to refrain from TWD is highly relevant given the threat this behaviour constitutes to public health and safety. Vollrath et al. (2016) conducted an observational study observing 11,837 drivers in three large German cities and reported an alarmingly high rate of texting while driving (4.5%) as compared to other international studies. This underlines the societal relevance of situating the present study in Germany.

TWD research frequently applies the Theory of Planned Behaviour (TPB) (Ajzen, 1991) which is a widely applied and supported theoretical framework, used to inform the design of persuasive communication campaigns (Cismaru, 2014). The TPB proposes that ‘intentions are a precursor to behaviour, which in turn are influenced by a number of socio-cognitive variables, namely, attitudes, subjective norms, and perceived behavioural control.’ (Benson, McLaughlin, & Giles, 2015). The present study focuses on the effect of emotion on attitudes and behavioural intentions.

In an experiment, Lennon, Rentfro, and O’Leary (2010) investigated whether campaigns including fear appeals changed participants’ beliefs about unsafe driving behaviours

and their behavioural intention to engage in them. The researchers reported a boomerang effect; participants indicated an increased behavioural intention of engaging in risky behaviours after exposure to the campaigns compared to before viewing the stimuli. This contrasts with Tannenbaum et al. (2015) who found that fear appeals have a positive effect on attitude, intentions, and behaviour and that there is no evidence that fear appeals backfire. Lennon, Rentfro, and O’Leary (2010) explained their findings by the low-to-moderate self-reported fear indicated by the participants. If low emotional arousal following fear appeals leads to a boomerang effect, this implies that disembodied cognition due to the use of an FL may lead to a boomerang effect as well, undermining the effectiveness of persuasive communication. The same may hold for sadness appeals, as sadness is generally characterized as a low-arousal emotion. In any case, the possibility of a boomerang effect due to low emotional arousal highlights the importance of comparing both types of appeals and a native versus foreign language in persuasive communication.

Present Study

To date, few studies have researched disembodied cognition in persuasive communication. It is of theoretical importance to test whether emotional blunting in an FL, already well-attested in research, has an impact on the effectiveness of persuasive messages. More specifically, no studies have investigated emotional blunting in traffic safety communication, a type of communication building on the arousal of strong emotions. Furthermore, no studies have investigated whether there is an interaction between language and type of appeal. There might be an interaction as both language and type of appeal have individually been shown to influence emotional arousal (Pavlenko, 2012; Russell, 1980).

The purpose of this study is to investigate disembodied cognition in persuasive traffic safety communication. Moreover, this study aims to fill a research gap by comparing the persuasiveness of fear and sadness appeals in traffic safety communication. Therefore, the following research questions will be investigated including the following hypotheses based on the literature.

RQ1: Does an L1 elicit greater emotionality than an FL in persuasive traffic safety communication?

RQ2: Does the language of the campaign (L1 vs. FL) influence attitudes and behavioural intention towards TWD?

RQ3: Does the type of appeal (fear vs. sadness) influence the emotionality of the campaign, attitudes towards TWD, and behavioural intention?

RQ4: Is there an interaction effect between language and type of appeal on each of the variables emotionality, attitudes towards TWD, and behavioural intention?

H1: Persuasive traffic safety communication in an L1 elicits greater emotionality than in an FL.

H2.1: Persuasive communication in an L1 leads to more negative attitudes towards TWD.

H2.2: Persuasive communication in an L1 leads to lower behavioural intentions to engage in TWD.

H3.1: A fear appeal elicits greater emotional arousal than a sadness appeal.

H3.2: The appeal that elicits greater emotional arousal may be more effective in influencing attitude and behavioural intentions in persuasive communication.

H4: The effect of language on emotionality might be greater in fear appeals than in sadness appeals.

Method

Materials

The materials consisted of four advertising posters; for each language (L1: German, FL: English) there was one fear and one sadness appeal poster (Appendix A). The three researchers individually came up with ideas for the sadness and fear appeal and decided on a final version after discussing the proposals. Besides other materials, Kareklas and Muehling's (2014) materials were taken into consideration since the researchers found a significant effect of their operationalisation of fear on attitudes and behavioural intention. For instance, the notion of 'texting kills' as well as the phrase 'please don't text and drive' were adopted. To create a sense of immediacy and guilt, the researchers added the phrase 'Is that text worth it?'

The text on the posters differed per type of appeal. The fear appeal read 'Is that text worth it? It only takes one second to crash. Texting kills. Keep your eyes on the road!'. Typical for fear appeals, the message focuses on creating a threatening scenario (Tannenbaum et al., 2015). The sadness appeal read 'Is that text worth it? I wish my dad hadn't sent that text, I miss

him so much. Please don't text and drive!', focusing on evoking feelings of separation, loss, and failure (Zheng, 2020).

All posters had a black background to keep the materials as similar as possible and to ensure that potential differences are due to the manipulated text and not due to uncontrollable differences in the background pictures.

The posters were translated into German using the Back Translation Method involving the researchers and an independent native speaker of German with good English proficiency.

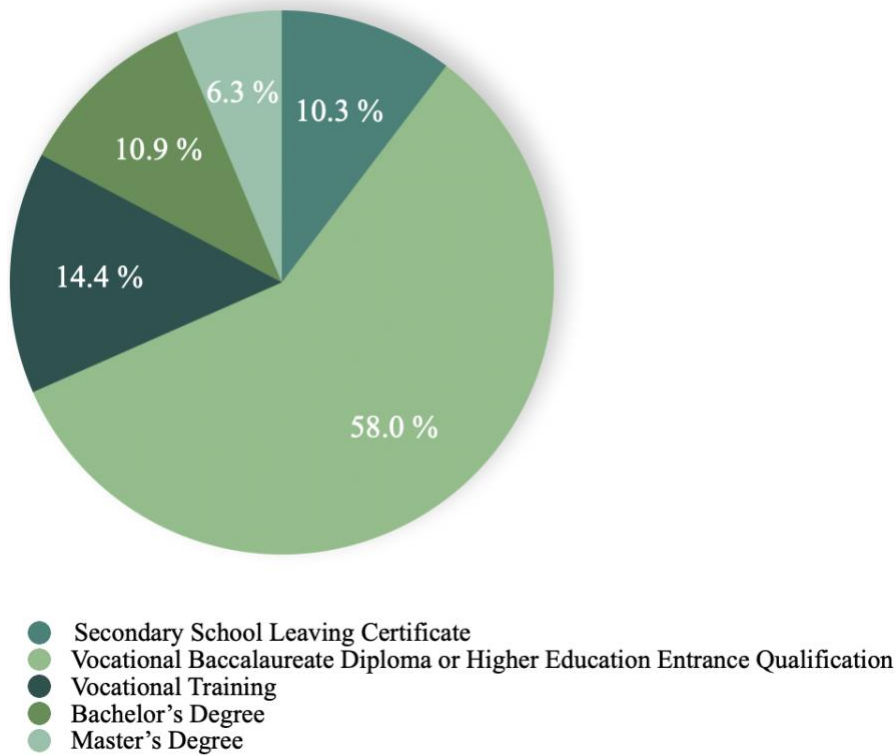
Subjects

174 native speakers of German participated in the experiment (age: $M = 28.44$, $SD = 14.12$, range 17-75; 32.2% male, 67.2% female, 0.6% non-binary). Prerequisites for taking part in the study were being a native speaker of German, having basic knowledge of English, ownership of a valid driver's licence, and having a mobile phone. 46 participants had been excluded from the study as they did not fulfil the requirements. Moreover, four additional participants who had later in the questionnaire indicated to have started learning English before the age of 5, the age at which children can start going to primary school in Germany, had been excluded before any analyses as this experiment was targeted at a population which learned English as an FL. This resulted in the total number of 174 participants.

Participants' highest completed education level ranged from a secondary school leaving certificate (10.3%) to a master's degree (6.3%), with most participants having completed a vocational baccalaureate diploma or higher education entrance qualification (58%) (Figure 1). Additionally, participants were asked to indicate the approximate age at which they started learning English ($M = 8.83$, $SD = 2.81$; range: 5-25). Most participants started learning English around the age of nine, which is in line with the start of English classes in German primary schools. Participants' self-reported English skills were generally medium ($M = 5.05$, $SD = 1.36$, range: 1-7), see instruments for scale details.

Figure 1

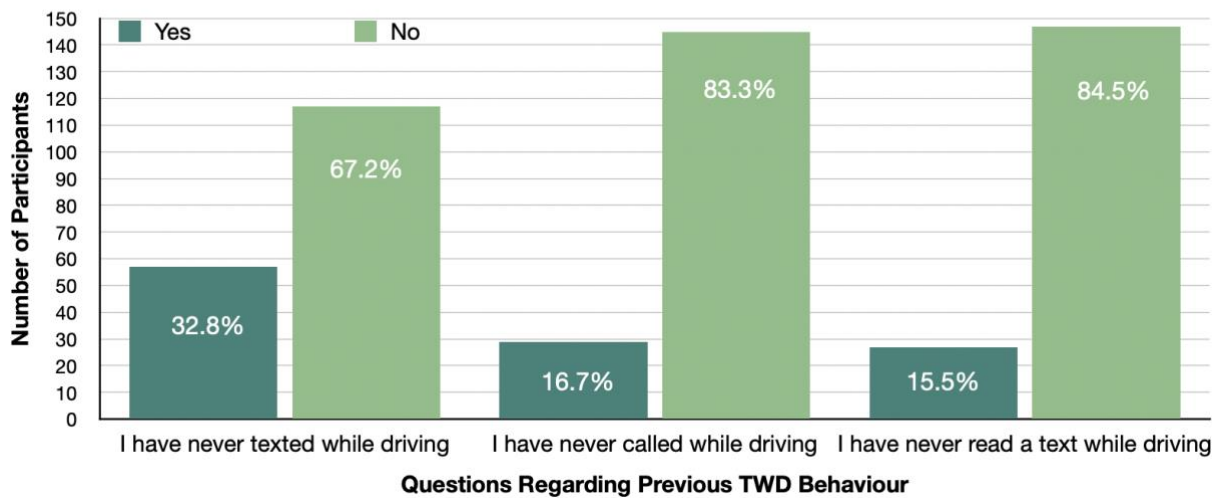
Percentages Concerning Participants' Highest Completed Level of Education



Moreover, most participants indicated to have used their phones to text, call, and read messages while driving before (Figure 2).

Figure 2

Numbers and Percentages Concerning Participants' Previous TWD Behaviour



There were no differences across the four experimental groups regarding the distribution of age ($F(3, 170) = .39, p = .763$), gender ($\chi^2(6) = 5.17, p = .522$), education ($\chi^2(12) = 10.85, p = .542$), age of English acquisition ($F(3, 170) = 2.45, p = .065$), English proficiency ($F(3, 170) = .12, p = .946$), and TWD habits ($F(3, 170) = .46, p = .712$).

Research Design

The experiment employed a 2 (Language: L1 German, FL English) x 2 (Type of appeal: fear, sadness) between-subjects design.

Instruments

To avoid an Anchor Contraction Effect, ‘the systematic tendency to report more intense emotions when answering questions using rating scales in a non-native language than in the native language’ (De Langhe et al., 2011), the questionnaire which was originally designed in English was translated into German. The three native German researchers independently translated the questionnaire and agreed on a final version. The English and German questionnaire items can be found in Appendices B and C, respectively.

Before being exposed to the conditions, participants were asked to indicate their prior TWD experience by answering yes or no to three statements established by the researchers. The reliability of the three items ‘I have never texted while driving’, ‘I have never called while driving’, and ‘I have never read a text while driving’ measuring prior TWD experience, was acceptable ($\alpha = .77$) (Appendix B3).

After exposure to the stimuli, a combination of established scales was used to measure emotionality, attitudes towards texting while driving, and behavioural intention.

To measure general emotionality, participants were asked to rate the emotional intensity of the poster on a 7-point unipolar scale with the anchoring points unemotional and emotional, adopted from Puntoni, de Langhe, and van Osselaer (2009) (Appendix B4a). Furthermore, emotional arousal and pleasure were measured using the “Affective Slider” as put forward by Betella and Verschure (2016), composed of two slider scales each anchored by two emojis measuring emotional arousal (top) and pleasure (bottom) on a continuous scale ranging from 0 to 100 (Appendix B4b). General emotionality as measured by these three items was unacceptable ($\alpha = .32$). Thus, subsequent analyses were run individually for each measure.

Moreover, items of the Discrete Emotions Questionnaire (Harmon-Jones, Bastian, & Harmon-Jones, 2016) measuring fear and sadness were included (Appendix B4c). Participants

were asked to indicate their response to the question ‘While viewing the poster to what extent did you experience these emotions?’ on a 7-point scale ranging from not at all (1) to at an extreme amount (7). The reliability of the four items measuring fear (fear, panic, scared, and terror) was excellent ($\alpha = .93$). The reliability of the four items measuring sadness (sad, grief, lonely, and empty) was good ($\alpha = .82$).

Instruments to measure attitudes, and behavioural intention concerning TWD were adopted from Benson, McLaughlin, and Giles’ (2014) study. Attitudes were measured using five 7-point semantic differential scales (Appendix B5). Participants saw the stem ‘texting while driving is...’ followed by scales consisting of both affective and instrumental bipolar adjectives. Furthermore, the researchers added a sixth pair ranging from ‘acceptable’ to ‘unacceptable’. The reliability of the six items measuring attitudes towards TWD was good ($\alpha = .89$).

Behavioural intentions regarding texting while driving were measured with three items (Appendix B6) composed by Benson, McLaughlin & Giles (2014). The statements were evaluated on a semantic differential scale ranging from strongly disagree (1) to strongly agree (7). The reliability of the three items measuring behavioural intention was excellent ($\alpha = .91$).

English proficiency of the participants was self-assessed with four 7-point Likert scales anchored by ‘very bad-very good’ following the statement ‘Please indicate how fluent your English is in the following areas: (1) speaking, (2) writing, (3) reading and (4) listening’ (based on Hendriks, van Meurs & Usmany 2021) (Appendix B8). The reliability of the four items measuring English proficiency was excellent ($\alpha = .94$).

Procedure

Firstly, participants were recruited through volunteer and snowball sampling. Participants accessed the experiment via a link provided by advertisements on the researchers’ social media, which led them to the online survey tool Qualtrics. Before exposure to the experimental conditions, participants were asked about their L1, basic English knowledge, as well as their possession of a valid driver’s license and mobile phone. The aim of the study was not stated in advance to prevent knowledge of the purpose of the study from distorting the results of the experiment. The study was merely introduced as a study about traffic safety campaigns. Participants were randomly assigned to a condition and given the following instructions: ‘Imagine you see this advertising poster on the side of the road. Please look at the poster carefully and answer the following questions.’ After exposure to one of the materials,

participants were asked to fill out a questionnaire measuring their emotionality, attitude, and behavioural intention. Lastly, participants were asked to provide demographic details. Moreover, participants were asked to self-report their English proficiency. There was no reward for participation. As predicted, completion of the study on average took participants around 6 minutes ($M = 5.63$, $SD = 10.61$, range: 2.07 – 119.42).

Statistical Treatment

Two-way ANOVAs were used to test whether the independent variables language (L1 German/FL English) and emotional appeal (fear/sadness) had an effect on the dependent variables emotionality, attitude, and behavioural intention. Moreover, interaction effects between the independent variables on each dependent variable were analysed.

Results

General Emotionality

A two-way ANOVA with language and type of appeal as factors showed no main effect of language ($F(1, 170) < 1$) and no main effect of type of appeal ($F(1, 170) = 3.43$, $p < .066$) on general emotionality. The interaction effect between language and type of appeal was also not statistically significant ($F(1, 170) = 3.46$, $p = .064$). For descriptives see Table 1.

Table 1

Means, Standard Deviations and n for General Emotionality in Function of Language and Type of Appeal (1 = Low; 7 = High)

Dependent Variable: General Emotionality				
Language	Appeal	<i>M</i>	<i>SD</i>	<i>n</i>
German	Fear	4.18	1.77	38
	Sadness	4.18	1.79	44
	Total	4.18	1.77	82
English	Fear	3.44	1.56	48
	Sadness	4.41	1.77	44
	Total	3.90	1.72	92
Total	Fear	3.77	1.69	86
	Sadness	4.30	1.78	88
	Total	4.03	1.75	174

To examine if emotional arousal is influenced by language and type of appeal, two two-way ANOVAs with language and type of appeal as factors were conducted. The analysis

showed no main effect of language on emotional arousal ($F(1, 170) = 1.05, p = .306$). In contrast, type of appeal was found to have a main effect on emotional arousal ($F(1, 170) = 5.41, p = .021$). As expected, the fear appeal emotionally aroused participants more ($M = 51.87, SD = 28.29$) than the sadness appeal ($M = 41.69, SD = 25.88$). The interaction effect between language and type of appeal was not statistically significant ($F(1, 170) = 2.73, p = .1$). For descriptives see Table 2.

Whether pleasure is influenced by language and type of appeal was investigated applying two two-way ANOVAs with language and type of appeal as factors. The analysis showed no main effect of language ($F(1, 170) < 1$) and type of appeal ($F(1, 170) = 1.37, p < .243$) on pleasure. The interaction effect between language and type of appeal was not statistically significant ($F(1, 170) = 2.57, p = .111$). For descriptives see Table 3.

Table 2

Means, Standard Deviations and n for Emotional Arousal in Function of Language and Type of Appeal (0 = Low; 100 = High)

Dependent Variable: Emotional Arousal				
Language	Appeal	<i>M</i>	<i>SD</i>	<i>n</i>
German	Fear	45.74	30.44	38
	Sadness	42.98	25.88	44
	Total	44.26	27.94	82
English	Fear	56.73	25.75	48
	Sadness	40.41	26.12	44
	Total	48.92	27.06	92
Total	Fear	51.87	28.29	86
	Sadness	41.69	25.88	88
	Total	46.72	27.50	174

Table 3

Means, Standard Deviations and n for Pleasure in Function of Language and Type of Appeal (0 = Low; 100 = High)

Dependent Variable: Pleasure				
Language	Appeal	<i>M</i>	<i>SD</i>	<i>n</i>
German	Fear	28.16	18.74	38
	Sadness	29.43	19.27	44
	Total	28.84	18.92	82
English	Fear	35.40	19.42	48

	Sadness	27.20	20.12	44
	Total	31.48	20.07	92
Total	Fear	32.20	19.35	86
	Sadness	28.32	19.62	88
	Total	30.24	19.53	174

Fear and Sadness Emotions

The arousal of fear emotions, as targeted with the fear appeal manipulation, was checked. A two-way ANOVA with language and type of appeal as factors showed no main effect of language on fear emotions ($F(1, 170) < 1$). Contrary to expectations, the type of appeal was not found to have a main effect on fear emotions ($F(1, 170) < 1$). For descriptives see Table 4. The interaction effect between language and type of appeal on fear emotions was statistically significant ($F(1, 170) = 4.85, p = .029$). Two independent samples t-tests showed that no two conditions differed from each other; holding language constant, there was no effect of appeal ($t(73.18) = 1.67, p = .099$; $t(85.63) = 1.39, p = .168$) and holding appeal constant, there was no effect of language ($t(70.15) = 1.42, p = .162$; $t(85.41) = 1.67, p = .099$).

Table 4

Means, Standard Deviations and n for Fear Emotions in Function of Language and Type of Appeal (1 = Low; 7 = High)

Dependent Variable: Fear Emotions				
Language	Appeal	<i>M</i>	<i>SD</i>	<i>n</i>
German	Fear	3.16	1.69	38
	Sadness	2.58	1.44	44
	Total	2.85	1.58	82
English	Fear	2.69	1.36	48
	Sadness	3.11	1.56	44
	Total	2.89	1.47	92
Total	Fear	2.90	1.52	86
	Sadness	2.85	1.52	88
	Total	2.87	1.52	174

Additionally, the arousal of sadness emotions, as targeted with the sadness appeal manipulation, was checked. A two-way ANOVA with language and type of appeal as factors showed no main effect of language on sadness emotions ($F(1, 170) < 1$). Type of appeal was found to have a main effect on sadness emotions ($F(1, 170) = 12.16, p < .001$). As expected, the sadness appeal aroused relatively more sadness ($M = 3.19, SD = 1.36$) than the fear appeal

($M = 2.47$, $SD = 1.29$). The interaction effect between language and type of appeal was not statistically significant ($F(1, 170) = 1.44$, $p = .232$). For descriptives see Table 5.

Table 5

Means, Standard Deviations and n for Sadness Emotions in Function of Language and Type of Appeal (1 = Low; 7 = High)

Dependent Variable: Sadness Emotions				
Language	Appeal	<i>M</i>	<i>SD</i>	<i>n</i>
German	Fear	2.70	1.32	38
	Sadness	3.16	1.46	44
	Total	2.95	1.41	82
English	Fear	2.28	1.24	48
	Sadness	3.23	1.28	44
	Total	2.73	1.34	92
Total	Fear	2.47	1.29	86
	Sadness	3.19	1.36	88
	Total	2.83	1.37	174

Attitudes Towards TWD

A two-way ANOVA with language and type of appeal as factors showed no main effect of language ($F(1, 170) < 1$) and type of appeal ($F(1, 170) < 1$) on attitude towards TWD. The interaction effect between language and type of appeal was not statistically significant ($F(1, 170) < 1$). For descriptives see Table 6.

Table 6

Means, Standard Deviations and n for TWD Attitude in Function of Language and Type of Appeal (1 = Low; 7 = High)

Dependent Variable: TWD Attitude				
Language	Appeal	<i>M</i>	<i>SD</i>	<i>n</i>
German	Fear	2.17	1.44	38
	Sadness	2.35	1.46	44
	Total	2.27	1.44	82
English	Fear	2.18	1.31	48
	Sadness	2.17	1.20	44
	Total	2.18	1.25	92
Total	Fear	2.18	1.36	86

Sadness	2.26	1.33	88
Total	2.22	1.34	174

Behavioural Intention Regarding TWD

A two-way ANOVA with language and type of appeal as factors showed no main effect of language ($F(1, 170) = 2.5, p = .116$) and type of appeal ($F(1, 170) < 1, p = .501$) on behavioural intention. The interaction effect between language and type of appeal was not statistically significant ($F(1, 170) < 1$). For descriptives see Table 7.

Table 7

Means, Standard Deviations and n for TWD Behavioural Intention in Function of Language and Type of Appeal (1 = Low; 7 = High)

Dependent Variable: TWD Behavioural Intention				
Language	Appeal	<i>M</i>	<i>SD</i>	<i>n</i>
German	Fear	2.64	1.63	38
	Sadness	2.71	1.78	44
	Total	2.68	1.70	82
English	Fear	2.17	1.36	48
	Sadness	2.42	1.51	44
	Total	2.29	1.43	92
Total	Fear	2.38	1.49	86
	Sadness	2.57	1.65	88
	Total	2.48	1.57	174

Exploratory research

All analyses reported above were repeated including only participants who indicated to have texted while driving before, which amounted to 114 participants of the sample (65.2%). This was done as the persuasive messages concerned texting while driving and thus the message might have been more relevant, possibly showing greater effects, for participants who have engaged in this behaviour since persuasion research suggests differences between low and high involvement regarding message effectiveness (Petty & Cacioppo, 1981). For descriptives see Appendix D.

The findings were the same as for the whole sample regarding general emotionality, pleasure, and attitudes; there were neither main effects nor interaction effects concerning the variables. Additionally, the findings for emotional arousal were the same, the fear appeal

emotionally aroused participants more ($M = 54.17, SD = 23.50$) than the sadness appeal ($M = 40.22, SD = 25.33; F(1, 53) = 4.36, p = .042$). However, in contrast to results including the whole sample, no interaction effect of language and type of appeal on fear emotions was found. Moreover, contrary to the findings above, there was no main effect of type of appeal on sadness emotions. Interestingly, in contrast to the findings above, there was a main effect of language on behavioural intention ($F(1, 53) = 4.26, p = .044$). Contrary to expectations, the behavioural intention to engage in TWD in the future was higher for participants who saw the German poster ($M = 1.65, SD = 1.11$) than for participants who saw the English poster ($M = 1.23, SD = 0.31$).

Conclusion

This experiment aimed to investigate disembodied cognition in persuasive traffic safety communication. Moreover, this study aimed to fill a research gap by comparing the persuasiveness of fear and sadness appeals in traffic safety communication. Unexpectedly, the present study only found support for one hypothesis; H3.1: A fear appeal elicits greater emotional arousal than a sadness appeal, which had already been established in previous literature (e.g. Russell, 1980). Contrary to expectations, no emotional blunting effect was found. Neither language nor the type of appeal affected the emotionality and effectiveness of the present traffic safety campaign. The following sections discuss the results grouped by research question.

Discussion

RQ1: Does an L1 Elicit Greater Emotionality Than an FL in Persuasive Traffic Safety Communication?

H1: 'Persuasive traffic safety communication in an L1 elicits greater emotionality than in an FL' obtained no support from the data which is contradictory to previous disembodied cognition literature which strongly suggests such an effect (e.g. Pavlenko, 2012). In this part, several possible reasons will be discussed.

One explanation could be that previous experiments finding an effect of language on emotionality investigated quite different materials. For instance, previous research looked at words in isolation or short phrases in a marketing context (e.g. Puntoni, de Langhe, & van Osselaer, 2009). Moreover, marketing messages oftentimes aim to arouse positively valenced emotions and oftentimes apply gain-frames whereas the present campaign aimed to arouse

negatively valenced emotions, applying a loss-frame. The genres may thus be too different and disembodied cognition may not apply to traffic safety communication.

Another explanation may be overall low or neutral general emotionality and emotional arousal ratings (see Table 1 & 2) because to find an effect of language on emotionality people must be emotional in the first place.

Moreover, participants completed the experiment online, meaning that there was no control in terms of point in time and setting in which participants completed the questionnaire, which may have affected the receptiveness of the participants and consequently the emotionality of the message.

It could also be the case that the operationalization of the emotional appeals was not successful, or at least did not arouse strong emotions. However, since the operationalization was partially shown to have been successful, it is more plausible to assume that the materials probably failed to arouse strong emotions.

RQ2: Does the Language of the Campaign (L1 vs FL) Influence Attitudes and Behavioural Intention Towards TWD?

In the present study, attitudes towards TWD were not affected by language; however, based on the literature the following results were predicted: ‘Persuasive communication in an L1 leads to more negative attitudes towards TWD’ (H2.1). Possibly, the absence of differences in attitudes can be affiliated with the results that language did not impact emotionality and that general emotionality and emotional arousal were low. It was predicted that an L1 would lead to more negative attitudes towards TWD as persuasive messages are more effective when a receiver’s emotions are aroused (Arnold, 1985) and in contrast to an L1, an FL was predicted to arouse weaker emotions due to disembodied cognition, possibly decreasing the effectiveness of the message (Pavlenko, 2012). However, since language did not affect emotionality and emotionality was overall low, it is plausible that the materials did not impact attitudes differently.

Moreover, behavioural intention was not influenced by the conditions in this study which was predicted in H2.2: ‘Persuasive communication in an L1 leads to lower behavioural intentions to engage in texting while driving’. This was predicted because persuasive messages are more effective, also in influencing people’s behavioural intentions, when a receiver’s emotions are aroused (Arnold, 1985). The missing effect may be associated with the insignificant results regarding emotionality and attitudes. Since behavioural intention is directly influenced by attitude and indirectly by emotions (Fishbein & Ajzen, 2009), a possible

explanation for the lack of differences may be found in the unsuccessful manipulation of emotionality and attitudes.

Another explanation for both the missing effect on attitude as well as behavioural intention might be the social desirability bias, ‘the tendency to underreport socially undesirable attitudes and behaviors and to overreport more desirable attributes’ (Latkin et al., 2017), because these variables were measured in a direct manner (Appendix B5, B6) and as attitudes and behavioural intentions regarding TWD were uniformly low (Table 7).

RQ3: Does the Type of Appeal (Fear vs Sadness) Influence the Emotionality of the Campaign, Attitudes Towards TWD, and Behavioural Intention?

Type of appeal did not influence the emotionality of the campaign, attitudes and behavioural intentions towards TWD.

To correctly interpret findings, firstly, a manipulation check for the arousal of fear and sadness emotions was conducted which showed mixed results. As expected, language conditions did not affect the arousal of fear and sadness, suggesting successful translations. Furthermore, the data indicates a successful manipulation of sadness emotions. Participants who saw the sadness appeal indicated to have felt more sadness emotions than participants who were exposed to the fear appeal.

Contrary to expectations, the fear appeal did not arouse significantly more fear than the sadness appeal, meaning that the manipulation of fear emotions was not successful. A possible explanation for this may be that it might be more difficult to arouse fear emotions than sadness emotions. This may be theorized based on differences in the intensity of emotional arousal between fear and sadness; sadness is a low-arousal emotion whereas fear is a high-arousal emotion (Russell, 1980). The present materials were able to evoke a low-arousal emotion; however, the materials combined with the setting were seemingly not appropriate to evoke a high-arousal emotion.

Unexpectedly, the interaction effect between language and type of appeal on fear emotions was statistically significant. However, two independent samples t-tests showed that no two conditions significantly differed from each other. This unclear pattern remains difficult to interpret.

Notwithstanding the missing difference between conditions in arousal of fear emotions, the operationalization of the emotional appeals was partially deemed successful as type of appeal had a main effect on emotional arousal. As predicted, based on the literature (e.g. Russell, 1980), the fear appeal elicited greater emotional arousal than the sadness appeal

(H3.1). Notably, this effect was only found for one of the three instruments measuring general emotionality: the instrument measuring emotional arousal. This will be further discussed in the limitations.

The predicted effect ‘The appeal that elicits greater emotional arousal may be more effective in influencing attitude and behavioural intentions in persuasive communication.’ (H3.2), was not supported. Even though the fear appeal caused more emotional arousal than the sadness appeal, the fear appeal did not influence attitudes and behavioural intention more effectively. This may be because the fear appeal did not successfully arouse fear emotions specifically. Nonetheless, it led to generally higher emotional arousal, and it remains questionable why it was not more effective. As reasoned above, this may be explained by the social desirability bias or previously existing negative attitudes and set behavioural intentions towards TWD in the population.

RQ4: Is There an Interaction Effect Between Language and Type of Appeal on Each of the Variables Emotionality, Attitudes Towards TWD, and Behavioural Intention?

No interaction effect between language and type of appeal on each of the dependent variables emotionality, attitudes towards TWD, and behavioural intention was found. With H4 it was predicted that ‘the effect of language on emotionality might be greater in fear appeals than in sadness appeals’. As fear is a high-arousal emotion whereas sadness is a low-arousal emotion (Russell, 1980) it was hypothesised that the differing levels of arousal between the two emotions may influence the perceived emotional state of the viewer as influenced by the message. Since there were no main effects of language and type of appeal on the dependent variables, it is plausible that there were also no interaction effects.

Exploratory Research

In contrast to results including the whole sample, no interaction effect of language and type of appeal on fear emotions was found. However, this is not concerning since results regarding the interaction effect were inconclusive.

Moreover, contrary to the findings above, there was no main effect of type of appeal on sadness emotions, indicating that the manipulation of sadness emotions was not successful.

Contrary to expectations, the behavioural intention to engage in TWD in the future was higher for participants who saw the German poster than for participants who saw the English poster. This suggests that the materials in the FL (English) were more effective than the ones in the participants’ L1 (German). However, since there were no differences between language

conditions regarding emotionality or differences between types of appeals, the findings remain difficult to interpret. Notably, the difference was rather small and both groups displayed a very low behavioural intention regarding TWD.

Limitations & Recommendations

The present study had several limitations which result in recommendations for future research.

Firstly, direct instruments were employed to measure attitudes and behavioural intention which may have affected the results due to the social desirability bias. Future studies should measure attitudes and behavioural intentions with both direct and indirect measures to increase reliability. An indirect measurement instrument of behavioural intentions regarding TWD was already established by Benson, McLaughlin, and Giles (2014) which was not used in this study to keep the questionnaire as short as possible.

Moreover, attitude and behavioural intention were not measured before exposure to the stimuli, impeding the possibility to make inferences about changes in attitude or behavioural intention. Future studies should implement such a measure.

Additionally, a differentiated approach is required to evaluate that only one of the three instruments measuring general emotionality, the scale measuring emotional arousal, found an effect of type of appeal on emotionality. Considering that this instrument is set out to specifically measure emotional arousal, while the third measure that was used is set out to measure pleasure, i.e. valence of emotions, it is logical that there is no significant result for the pleasure instrument, as it simply measured the positive or negative valence of the emotions participants felt. However, it is questionable why the same effect was not found with the general emotionality instrument. This may have had to do with the anchoring points ‘not emotional – emotional’ as the instrument that measured emotional arousal uses emojis as anchoring points. Participants may have been reluctant to explicitly state that they are emotional whereas the emojis captured participants’ emotions indirectly. Future studies should employ other, less subjective, and indirect instruments to measure emotional arousal such as skin conductance response. Additionally, the instrument measuring general emotionality was a 7-point scale whereas the scale measuring emotional arousal ranged from 0-100 which was thus more precise and allowed for more variability. Future research should aim for a more consistent measurement of items comprising one variable to raise the internal consistency of scales.

Other limitations concern the materials. The researchers decided on a plain black background with a white font. This decision was based on personal observations of such simply designed billboards in Germany, but not on a scientific basis. While this design allowed for as little variation as possible between appeal types, it is questionable whether it was suitable for the aim of arousing strong emotions. However, this decision was made to be able to make inferences regarding causality concerning the effect of language on emotionality. Moreover, the length and the content of the message were, even though designed after some initial research, arbitrarily decided on by the researchers. Future studies should more heavily base their design decisions on scientific literature. Furthermore, it is suggested to pre-test the materials regarding their general emotional arousal as well as their arousal of target emotions (e.g. with the Geneva Emotion Wheel; see Scherer, 2005; Scherer, Shuman, Fontaine, & Soriano, 2013).

Moreover, the term ‘texting while driving’, as frequently used in English traffic safety campaigns, was translated into German as ‘Handy am Steuer’. This is not a direct translation of the term. However, a direct translation of TWD cannot be found in German, which is why it was decided to use the frequently employed term ‘Handy am Steuer’ which roughly translates to ‘Phone usage while driving’. The German term, however, entails more activities than solely texting while driving; it for instance implies calling or scrolling through social media. This translation caused an asymmetry between language conditions possibly influencing the results as participants in the German condition had different associations with the term or were possibly confused about what exactly it entails. For instance, it was unclear whether calling with a hands-free speaking system falls under calling while driving. Future studies should design campaigns for issues for which direct translations are available or find more suitable translation options. Moreover, providing a definition of the issue or terminology before the start of the experiment could prevent unclarity.

Additionally, the presentation of the materials lacked ecological validity. The posters were designed as billboards which drivers quickly pass on the street and thus process peripherally. However, in the present study, participants were not driving, which would add urgency and relevance to the message, and there was no time limitation, possibly allowing for high elaboration of the message. This, in turn, may also have affected language processing. Future studies should aim for a setting that is as realistic as possible, for instance using a driving simulator.

Other limitations concern the subjects. Due to volunteer and snowball sampling, most participants were young, educated individuals from the researcher’s network. This sample is

not representative of the whole driver population in Germany. Moreover, even though most participants were around 20 years old, the age range was quite high (17-75 years old) which may have impacted the results due to generational differences in views on TWD, based on which an age limit would have made sense (Benson, McLaughlin, & Giles, 2014). Furthermore, the sample may represent a population with a comparatively high English language proficiency which may be an explanation for the missing emotional blunting effect as a foreign language is increasingly emotional with higher proficiency (Pavlenko, 2012). Additionally, the sample only included German people on the road, whereas, in reality, many different nationalities are present on German streets and highways. Future research should aim for a more representative sample.

Implications

The present study carries several scientific and theoretical implications.

Pavlenko (2012) theorized that there are several factors that moderate how an L1 versus an FL affects emotional arousal. Thus, emotional blunting is more complex than a straightforward claim that an L1 is always more emotional than an FL. This was supported in the present study. Even though an emotional blunting effect was expected since the topic of family and death are primarily connected to a native language, maybe factors other than the word domain have influenced the emotionality as induced by the different languages. For instance, emotionality in response to persuasive traffic safety campaigns may be the same in an L1 and an FL for the written modality; however, exposure to an FL is likely to be lower in the auditory modality, consequently leading to an emotional blunting effect. Future studies should investigate disembodied cognition in spoken messages, for instance, public safety messages on the radio and compare them to written messages.

Puntoni, de Langhe, and van Osselaer (2009) suggested that bilingual ads could be effective. Since no differences between language conditions were found, bilingual ads could indeed be employed in Germany and their effectiveness should be tested in future research. Since language did not have an effect, another idea would be to globalize campaigns using English to be cost-efficient and reach larger audiences. However, it is questionable whether the English proficiency of all German drivers is as high as that of the investigated sample.

According to the valence and arousal emotion model (Russell, 1980), fear has negative valence and high arousal, whereas sadness has negative valence and low arousal. This has been supported in the present study. However, instruments measuring specifically fear emotions did not indicate successful arousal of fear. This might imply that it is easier to induce low-arousal

emotions than high-arousal emotions, at least in an online experimental setting. It has already been theorized that the strength of arousal might affect cognition and behaviour differently (Russell, 1980).

Additionally, the present study was the first to compare fear and sadness appeals in persuasive communication. The findings indicate that they do not differ in effectiveness, suggesting that multiple appeal types can be equally persuasive. Future research should compare different appeal types to investigate this idea.

Previous studies found a boomerang effect of fear appeals, meaning that participants indicated increased behavioural intention of engaging in risky behaviours (Lennon, Rentfro, & O'Leary, 2010). The researchers explained this by the low-to-moderate self-reported fear indicated by the participants (Lennon, Rentfro, & O'Leary, 2010). In the present study, neither low fear emotionality nor low emotional arousal for the sadness appeal led to a boomerang effect. Either the boomerang effect is not correlated with emotionality, or it is possible that the present study did not find such an effect due to the social desirability bias or established previous negative attitudes and behavioural intentions. Future studies should further examine the boomerang effect and its causes.

Overall, this study has contributed to a better understanding of language use and emotional appeals in persuasive communication which researchers can build on for future investigations. Moreover, designers of traffic safety campaigns can now draw on these insights which can hopefully add to the success of prospective campaigns.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Arnold, V. D. (1985). The importance of pathos in persuasive appeals. *The Bulletin*, pp. 26-27.
- Benson, T., McLaughlin, M., & Giles, M. (2015). The factors underlying the decision to text while driving. *Transportation Research Part F*, 35, 85-100.
- Betella, A., & Verschure, P. F. (2016). The affective slider: a digital self-assessment scale for the measurement of human emotions. *PloS one*, 11(2), e0148037. <https://doi.org/10.1371/journal.pone.0148037>
- Biener, L., McCallum-Keeler, G. & Nyman, A. L. (2000). Adults' response to Massachusetts anti-tobacco television advertisements: impact of viewer and advertisement characteristics. *Tobacco Control*, 9, 401-407.
- Caldwell-Harris, C. & Aycicegi-Dinn, A. (2016). Emotionality differences between a native and foreign language: Implications for cultural marketing strategies. *Journal of Cultural Marketing Strategy*, 2(1), 9–20.
- Cismaru. (2014). Using the extended parallel process model to understand texting while driving and guide communication campaigns against it. *Social Marketing Quarterly*, 20(1), 66-82.
- De Langhe, B., Puntoni, S., Fernandes, D., & Van Osselaer, S. M. J. (2011). The anchor contraction effect in international marketing research. *Journal of Marketing Research*, 48(2), 366–380. <https://doi.org/10.1509/jmkr.48.2.366>
- Dingus, T.A., Klauer, S.G., Neale, V.L., Petersen, A., Lee, S.E., Sudweeks, J.D., Perez, M.A., Hankey, J., Ramsey, D., Gupta, S., Bucher, C., Doerzaph, Z.R., Jermeland, J., & Knippling, R.R. (2006). The 100-car naturalistic driving study, Phase II-results of the 100-car field experiment (No. HS-810 593). Virginia Polytechnic Institute and State University, Blacksburg, National Highway Traffic Safety Administration, United States.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behaviour: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Fishbein, M. & Ajzen, I. (2009). *Predicting and changing behavior: The reasoned action approach*. New York: Psychology Press.
- Gerritsen, M., Nickerson, C., van den Brandt, C., Crijns, R., Dominguez, N., van Meurs, F., & Nederstigt, U. (2007). English in print advertising in Germany, Spain and the

- Netherlands: Frequency of occurrence, comprehensibility and the effect on corporate image. In G. G. a. C. Ilie (Ed.), *The role of English in institutional and business settings*. Berlin: Peter Lang, 79-98.
- Harmon-Jones, C., Bastian, B., & Harmon-Jones, E. (2016) The discrete emotions questionnaire: A new tool for measuring state self-reported emotions. *PLoS ONE*, *11*(8): e0159915. doi:10.1371/journal.pone.0159915
- Hendriks, B., van Meurs, F., & Usmany, N. (2021). The effects of lecturers' non-native accent strength in English on intelligibility and attitudinal evaluations by native and non-native English students. *Language Teaching Research*. *0*(0).
<https://doi.org/10.1177/1362168820983145>
- Hilgendorf, S. (2007). English in Germany: contact, spread and attitudes. *World Englishes*, *26*(2), 131-184.
- Jorgensen, P. F. (1996). Chapter 15 – Affect, persuasion, and communication process. In P. A. Andersen & L. K. Guerrero (Eds.), *Handbook of Communication and Emotion* (pp. 403–422). Academic Press. <https://doi.org/10.1016/B978-012057770-5/50017-5>
- Kareklas, I., & Muehling, D.D. (2014). Addressing the texting and driving epidemic: mortality salience priming effects on attitudes and behavioral intentions. *The journal of consumer affairs*, *48*(2), 223-250.
- Latkin, C. A., Edwards, C., Davey-Rothwell, M. A., & Tobin, K. E. (2017). The relationship between social desirability bias and self-reports of health, substance use, and social network factors among urban substance users in Baltimore, Maryland. *Addictive behaviors*, *73*, 133–136.
- Lennon, R., Rentfro, R., & O'Leary, B. (2010). Social marketing and distracted driving behaviors among young adults: the effectiveness of fear appeals. *Academy of Marketing Studies Journal*, *14*, 95-113.
- Lulofs, R. S. (1991). *Persuasion: Contexts, people, and messages*. Scottsdale, AZ: Gorsuch-Scarbrick.
- Pavlenko, A. (2012). Affective processing in bilingual speakers: disembodied cognition? *International Journal of Psychology*, *47*(6), 405–428.
<https://doi.org/10.1080/00207594.2012.743665>
- Petty, R. E. & Briñol, P. (2014). Emotion and persuasion: Cognitive and meta-cognitive processes impact attitudes. *Cognition and Emotion*, *29*(1), 1–26.
<https://doi.org/10.1080/02699931.2014.967183>

- Petty, R. E. & Cacioppo, J. T. (1981). Issue involvement as a moderator of the effects on attitude of advertising content and context. *NA - Advances in Consumer Research*, 8, 20-24.
- Petty, R., E. & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In L. Berkowitz, *Advances in experimental social psychology* (pp. 123-205). San Diego, CA: Academic Press.
- Puntoni, S., De Langhe, B., & Van Osselaer, S. (2009). Bilingualism and the emotional intensity of advertising language. *Journal of Consumer Research*, 35, 1012–1025. <https://doi.org/10.1086/595022>
- Raaijmakers, J. G. W., & Shiffrin, R. M. (1992). Models for recall and recognition. *Annual Review of Psychology*, 43, 205–34.
- Russell, J. A. (1980). A circumplex model of affect. *Journal of Personality and Social Psychology*, 39(6), 1161–1178.
- Scherer, K. R. (2005). What are emotions? And how can they be measured? *Social Science Information*, 44(4), 693-727.
- Scherer, K.R., Shuman, V., Fontaine, J.R.J, & Soriano, C. (2013). The GRID meets the Wheel: Assessing emotional feeling via self-report. In Johnny R.J. Fontaine, Klaus R. Scherer & C. Soriano (Eds.), *Components of Emotional Meaning: A sourcebook* (pp. 281-298). Oxford: Oxford University Press.
- Tannenbaum, M., Hepler, J., Zimmerman, R. S., Saul, L., & Jacobs, S. (2015). Appealing to fear: A meta-analysis of fear appeal effectiveness and theories. *Psychological Bulletin*, 141(6), 1178-1204.
- Victor, T., Bärghman, J., Boda, C.-N., Dozza, M., Engström, J., Flannagan, C., Lee, J.D. & Markkula, G. (2014). *Analysis of naturalistic driving study data: safer glances, driver inattention, and crash risk (Strategic Highway Research Program, SHRP 2)*. Transportation research board of the national academics.
- Vollrath, M., Huemer, A. K., Teller, C., Likhacheva, A., & Fricke, J. (2016). Do German drivers use their smartphones safely?-Not really! *Accident Analysis and Prevention*, 96, 29-38.
- Zheng, M. X. (2020). When and why negative emotional appeals work in advertising: A review of research. *Open Journal of Social Sciences*, 8, 7-16.

Appendix A
Materials

English Fear

Is that text worth it?
It only takes one
second to crash.

Texting kills. Keep
your eyes on the
road!

German Fear

Ist diese Nachricht
es wert? Es braucht
nur eine Sekunde
zum Crash.

Handy am Steuer
tötet. Augen auf die
Straße!

English Sadness

Is that text worth it?
I wish my dad
hadn't sent that
text, I miss him so
much.

Please don't text
and drive!

German Sadness

Ist diese Nachricht es
wert? Ich wünschte,
mein Vater hätte diese
Nachricht nicht
geschrieben, ich
vermisse ihn so sehr.

Bitte leg das Handy
weg!

Appendix B

English Questionnaire Items

Please note that the subheadings were not visible to participants.

Thank you for wanting to participate in our study.

We are five 'International Business Communication' students at Radboud University in the Netherlands. As part of our bachelor thesis, we are investigating campaigns against texting while driving.

The questionnaire takes about 5 to 10 minutes to fill in. There are no wrong answers.

Participation in this study is anonymous. You have the right to quit the questionnaire at any time without giving a reason.

For possible questions or comments, please feel free to contact Lina Martens (lina.martens@ru.nl).

B1. Consent to participate in the study

- I have read and understood the above information. I agree to participate in this study.
- I do not agree to participate in this study.

B2. Selective control variables

Are you a native German?	Yes	No
Do you have a basic knowledge of English?	Yes	No
Do you own a valid driver's license?	Yes	No
Do you own a smartphone?	Yes	No
Are you older than 16 years?	Yes	No

B3. Prior TWD experiences

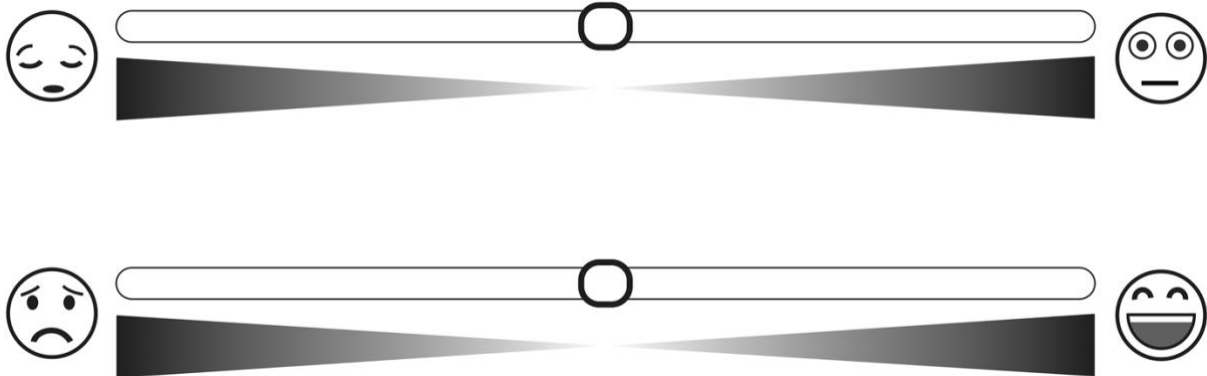
- I have never texted while driving Yes No
- I have never called while driving Yes No
- I have never read a text while driving Yes No

B4. Emotionality

a. How did you feel while viewing the poster?

unemotional 1 2 3 4 5 6 7 emotional

b. Rate your emotional state when looking at the poster by moving the sliders.



c. While viewing this poster, to what extent did you experience these emotions?

	1 not at all	2 slightly	3 somewhat	4 moderate	5 quite a bit	6 very much	7 at an extreme amount
fear							
panic							
scared							
terror							
sadness							

grief								
loneliness								
emptiness								

B5. Attitude towards TWD

Texting while driving is...

Dangerous	1	2	3	4	5	6	7	Safe
Useful	1	2	3	4	5	6	7	Worthless
Good	1	2	3	4	5	6	7	Bad
Unpleasant	1	2	3	4	5	6	7	Pleasant
Stress-free	1	2	3	4	5	6	7	Stressful
Acceptable	1	2	3	4	5	6	7	Unacceptable

B6. Behavioral Intention

I expect to text while driving

Strongly disagree	1	2	3	4	5	6	7	Strongly agree
-------------------	---	---	---	---	---	---	---	----------------

It is likely that I will text while driving

Strongly disagree	1	2	3	4	5	6	7	Strongly agree
-------------------	---	---	---	---	---	---	---	----------------

I intend to text while driving

Strongly disagree	1	2	3	4	5	6	7	Strongly agree
-------------------	---	---	---	---	---	---	---	----------------

B7. Demographics

How old are you? → own age indication

What gender do you identify most with? Female Male Non-binary Other

B8. Education

What is your highest completed level of education?

- secondary school leaving certificate

- vocational baccalaureate diploma or higher education entrance qualification
- vocational training
- bachelor's degree
- master's degree

When did you start learning English? → own age indication

Please indicate how fluent your English is in the following areas:

(1) speaking	very bad	1	2	3	4	5	6	7	very good
(2) writing	very bad	1	2	3	4	5	6	7	very good
(3) reading	very bad	1	2	3	4	5	6	7	very good
(4) listening	very bad	1	2	3	4	5	6	7	very good

B9. End of survey

- Unfortunately, you do not meet the participation requirements of this study. Nevertheless, we thank you for your time and effort.
- Thank you for your participation in this survey. Your responses have been recorded.

Appendix C

German Questionnaire Items

Please note that the subheadings were not visible to participants.

Danke, dass Sie an unserer Studie teilnehmen möchten.

Wir sind fünf 'International Business Communication' Studenten an der Radboud Universität in den Niederlanden. Im Rahmen unserer Bachelorarbeit untersuchen wir Kampagnen gegen die Nutzung vom Handy am Steuer.

Das Ausfüllen des Fragebogens dauert etwa 5 bis 10 Minuten. Es gibt keine falschen Antworten.

Die Teilnahme an dieser Studie ist anonym. Sie haben das Recht, den Fragebogen jederzeit abzubrechen, ohne einen Grund dafür angeben zu müssen.

Für mögliche Fragen oder Anmerkungen kontaktieren Sie gerne Lina Martens (lina.martens@ru.nl).

C1. Zustimmung zur Teilnahme an der Studie

- Ich habe die oben genannten Informationen gelesen und verstanden. Ich stimme der Teilnahme an dieser Studie zu.
- Ich stimme der Teilnahme dieser Studie nicht zu.

C2. Kontrollvariablen zum Aussortieren

Ist Deutsch Ihre Muttersprache?	Ja	Nein
Haben Sie die grundlegenden Englischkenntnisse?	Ja	Nein
Besitzen Sie einen gültigen Führerschein?	Ja	Nein
Besitzen Sie ein Smartphone?	Ja	Nein
Sind Sie älter als 16 Jahre?	Ja	Nein

C3. Erfahrungen mit Handy am Steuer

Ich habe noch nie eine Nachricht beim Autofahren verschickt.	Ja	Nein
Ich habe noch beim Autofahren telefoniert.	Ja	Nein
Ich habe noch nie eine Nachricht beim Autofahren gelesen.	Ja	Nein

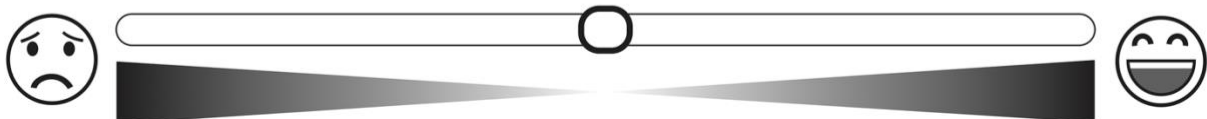
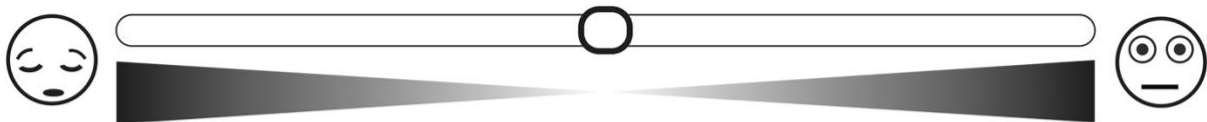
Condition

C4. Emotionalität

a. Wie haben Sie sich beim Ansehen des Werbeplakats gefühlt?

Emotionslos 1 2 3 4 5 6 7 Emotional

b. Bewerten Sie Ihre Emotionslage beim Ansehen des Werbeplakats indem Sie die Regler verschieben.



c. In welchem Maß haben Sie beim Betrachten des Werbeplakats diese Gefühle verspürt?

	1 überhaupt nicht	2 ein wenig	3 etwas	4 mittelmäßig	5 relativ viel	6 sehr viel	7 extrem viel
Angst							
Panik							

Furcht								
Schrecken								
Traurigkeit								
Trauer								
Einsamkeit								
Leere								

C5. Stellung gegenüber Handy am Steuer

Handy am Steuer ist...

Gefährlich	1	2	3	4	5	6	7	Sicher
Nützlich	1	2	3	4	5	6	7	Nutzlos
Gut	1	2	3	4	5	6	7	Schlecht
Bedauerlich	1	2	3	4	5	6	7	Erfreulich
Stressfrei	1	2	3	4	5	6	7	Stressig
Akzeptabel	1	2	3	4	5	6	7	Inakzeptabel

C6. Verhaltensabsicht

Ich erwarte in Zukunft mit Handy am Steuer zu fahren.

Trifft gar nicht zu	1	2	3	4	5	6	7	Trifft voll zu
---------------------	---	---	---	---	---	---	---	----------------

Es ist wahrscheinlich, dass ich in Zukunft mit Handy am Steuer fahre.

Trifft gar nicht zu	1	2	3	4	5	6	7	Trifft voll zu
---------------------	---	---	---	---	---	---	---	----------------

Ich beabsichtige in Zukunft mit Handy am Steuer zu fahren.

Trifft gar nicht zu	1	2	3	4	5	6	7	Trifft voll zu
---------------------	---	---	---	---	---	---	---	----------------

C7. Demografische Details

Wie alt sind Sie? → eigene Angabe

Mit welchem Geschlecht identifizieren Sie sich am meisten?

Weiblich Männlich Nicht-Binär Andere

C8. Bildung

Was ist Ihr höchster Schulabschluss?

Mittlere Reife (Fach)-Abitur Bachelor Master
PhD/Doktor Lehre/Ausbildung Kein Abschluss

In welchem Alter haben Sie angefangen Englisch zu lernen? → eigene Angabe

Bitte geben Sie Ihre Englischkenntnisse in den folgenden Bereichen an.

(1) Sprechen

Sehr schlecht 1 2 3 4 5 6 7 Sehr gut

(2) Schreiben

Sehr schlecht 1 2 3 4 5 6 7 Sehr gut

(3) Lesen

Sehr schlecht 1 2 3 4 5 6 7 Sehr gut

(4) Hören

Sehr schlecht 1 2 3 4 5 6 7 Sehr gut

C9. Ende der Umfrage

- Leider erfüllen Sie nicht die Teilnahmebedingungen dieser Studie. Wir danken Ihnen trotzdem für Ihre Zeit und Mühe.
- Wir danken Ihnen für Ihre Teilnahme an dieser Umfrage. Ihre Antworten wurden erfasst.

Appendix D
Descriptive Statistics Exploratory Research

Table D1

Means, Standard Deviations and n for General Emotionality in Function of Language and Type of Appeal (1 = Low; 7 = High)

Dependent Variable: General Emotionality				
Language	Type of Appeal	<i>M</i>	<i>SD</i>	<i>n</i>
German	Fear	4.54	1.05	13
	Sadness	4.08	1.78	12
	Total	4.32	1.44	25
English	Fear	3.35	1.54	17
	Sadness	4.20	1.97	15
	Total	3.75	1.78	32
Total	Fear	3.87	1.46	30
	Sadness	4.15	1.85	27
	Total	4.00	1.65	57

Table D2

Means, Standard Deviations and n for Emotional Arousal in Function of Language and Type of Appeal (0 = Low; 100 = High)

Dependent Variable: Emotional Arousal				
Language	Type of Appeal	<i>M</i>	<i>SD</i>	<i>n</i>
German	Fear	55.38	23.21	13
	Sadness	43.00	25.24	12
	Total	49.44	24.52	25
English	Fear	53.24	24.39	17
	Sadness	38.00	26.05	15
	Total	46.09	25.94	32
Total	Fear	54.17	23.50	30
	Sadness	40.22	25.33	27
	Total	47.56	25.16	57

Table D3

Means, Standard Deviations and n for Pleasure in Function of Language and Type of Appeal (0 = Low; 100 = High)

Dependent Variable: Pleasure				
Language	Type of Appeal	<i>M</i>	<i>SD</i>	<i>n</i>
German	Fear	26.69	14.26	13
	Sadness	29.42	21.10	12
	Total	28.00	17.54	25
English	Fear	35.71	22.63	17
	Sadness	26.00	17.99	15
	Total	31.16	20.85	32
Total	Fear	31.80	19.68	30
	Sadness	27.52	19.12	27
	Total	29.77	19.36	57

Table D4

Means, Standard Deviations and n for Fear Emotions in Function of Language and Type of Appeal (1 = Low; 7 = High)

Dependent Variable: Fear Emotions				
Language	Type of Appeal	<i>M</i>	<i>SD</i>	<i>n</i>
German	Fear	3.42	1.40	13
	Sadness	2.44	1.31	12
	Total	2.95	1.42	25
English	Fear	2.66	1.46	17
	Sadness	3.10	1.89	15
	Total	2.87	1.66	32
Total	Fear	2.99	1.46	30
	Sadness	2.81	1.66	27
	Total	2.90	1.55	57

Table D5

Means, Standard Deviations and n for Sadness Emotions in Function of Language and Type of Appeal (1 = Low; 7 = High)

Dependent Variable: Sadness Emotions				
Language	Type of Appeal	<i>M</i>	<i>SD</i>	<i>n</i>
German	Fear	2.88	0.94	13
	Sadness	3.27	1.31	12
	Total	3.07	1.13	25
English	Fear	2.44	1.35	17
	Sadness	3.12	1.35	15
	Total	2.76	1.37	32
Total	Fear	2.63	1.19	30
	Sadness	3.19	1.31	27
	Total	2.89	1.27	57

Table D6

Means, Standard Deviations and n for TWD Attitude in Function of Language and Type of Appeal (1 = Low; 7 = High)

Dependent Variable: TWD Attitude				
Language	Type of Appeal	<i>M</i>	<i>SD</i>	<i>n</i>
German	Fear	2.01	1.63	13
	Sadness	2.18	1.71	12
	Total	2.09	1.64	25
English	Fear	2.03	1.33	17
	Sadness	1.79	1.35	15
	Total	1.92	1.32	32
Total	Fear	2.02	1.44	30
	Sadness	1.96	1.50	27
	Total	1.99	1.46	57

Table D7

Means, Standard Deviations and n for TWD Behavioural Intention in Function of Language and Type of Appeal (1 = Low; 7 = High)

Dependent Variable: Behavioural Intention				
Language	Type of appeal	<i>M</i>	<i>SD</i>	<i>n</i>
German	Fear	1.51	1.01	13
	Sadness	1.81	1.24	12
	Total	1.65	1.11	25
English	Fear	1.22	0.29	17
	Sadness	1.24	0.34	15
	Total	1.23	0.31	32
Total	Fear	1.34	0.70	30
	Sadness	1.49	0.89	27
	Total	1.42	0.79	57