The role of humor and threat on predicting resistance and persuasion

Master thesis in Resistance & Persuasion

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Table of Contents

Abstract

Recent studies on resistance and persuasion have pointed to humor as a helpful technique to reduce resistance towards threatening health communication. The current experiment is a 2 (high threat vs. low threat) x 3 (humor absent vs. content humor vs. source humor) between-subjects experimental design investigating the influence of threat and humor on different resistance strategies and how those are related to persuasion in a context of alcohol abuse prevention campaigns for young populations. The participants did not show high resistance overall and resistance did not seem to directly relate to persuasion. The most common resistance type elicited was negative affect and humor and threat behaved differently on eliciting different types of resistance.

1. Introduction

Alcohol abuse prevention is of utmost importance for society, and especially for youngsters. Even if most of the occidental countries invest a fair amount of resources to face this issue, the rates of alcohol consumption are fairly high among youngsters, who are in the main life period for initiation of alcohol use (Degenhardt, Stockings, Patton, Hall and Lynskey, 2016). Health communication practitioners design and spread campaigns in online and offline media to let the population understand the risks of alcohol consumption (cancer, stroke, irrational behavior and impulsive behavior among others). However, several studies support that many health persuasive campaigns do not achieve their goals of attitudinal and behavioral change (Fishbein, Hall-Jamieson, Zimmer, Von Haeften and Nabi, 2002), and sometimes these campaigns may produce less healthful behaviors in participants than the ones they already have as a defensive response (Hornik, 2002).

These reverse effects have been especially shown in the college students' context, in which alcohol abuse is a pressing issue (Richards & Banas, 2015). The undesired effects entailing increased abuse of alcohol as a response to health campaigns revealed in these studies show the difficulty of anti-alcohol campaigns and the need for more research to increase the persuasiveness of the health messages. The current research aims to get useful findings on the ways in which an audience reacts to anti-alcohol abuse messages to help health communication

practitioners to be more effective when communicating the risks and negative consequences of alcohol abuse to the population, and especially to young people. Furthermore, the study also aims to gain scientific and theoretical insights on this topic.

The defensive responses people present to health messages are known as resistance, which is known to be negatively correlated with persuasion (Knowles & Linn, 2004). Health communication practitioners often find high resistance to health information in their audience (Van't Riet & Ruiter, 2013), which reduces the effectiveness of the health communication campaigns. Therefore, health communication practitioners must focus on creating health communication campaigns able to overcome the resistance presented by their audience (Hendriks & Janssen, 2018). If this resistance is overcome, the messages will be conveyed in a more effective way and the persuasive health campaigns will be more successful. The current research focuses on the resistance process and its relationship with persuasion, which is a topic largely overlooked in research until now.

In the marketing field, Knowles and Linn (2004) classified a number of strategies to reduce the resistance presented by an audience. Fransen, Verlegh, Kirmani, and Smit (2015), further argue that these strategies to neutralize resistance increase persuasiveness when they are presented in a way specifically facing the type of resistance a receiver presents. These findings should be taken into account in the health communication field since the persuasive purpose is similar to advertisers. Predicting the types of resistance to persuasive messages in health communication and using the proper tactics to neutralize them represents an important challenge for researchers nowadays.

Recent studies on resistance and its influence on persuasion (Blanc & Brigaud, 2014; Lyttle, 2001) have pointed to humor as a helpful technique to reduce high levels of resistance towards persuasive health communication. Indeed, when communicated with humor, health information perceived as threatening is more likely to be processed (Blanc & Brigaud, 2014). Work by other authors such as Lyttle (2001) supports that humor increases the effectiveness of the persuasive message when it is connected either to the content or the source of the message. In any case, these studies focused on the behavioral reactions of participants rather than on the different types of resistance presented, and how strong the resistance was. As a consequence,

there is not much known about how and why humor may reduce resistance in the health persuasive communication context.

The current research aims to explain how and why humor can be effective for health communication practitioners, especially exploring the effectiveness of humor in reducing specific types of resistance responses, and how these types of resistance influence persuasion.

RQ1: To what extent do humor connected to the message source and humor connected to the message content reduce different types of resistance in response to a threatening health message?

RQ2: To what extent do the different types of resistance predict persuasion?

2. Framework

2.1 Health communication and threatening messages

Many governments invest in alcohol abuse prevention campaigns and institutions to help the young population to avoid unhealthy behaviors (e.g. "Parents, Young People and Alcohol" campaign - a joint initiative between the Mental Health Commission, Curtin University and the Telethon Institute for Child Health Research from Australia). This type of communication activities is usually focused on the young population since they are one of the most vulnerable groups to suffer the alcohol abuse consequences as cancer or irrational behavior among others (Simons-Morton, Donohew and Davis, 1997). Communicating how harmful alcohol abuse is to youngsters is of utmost importance to avoid short term consequences, as well as to prevent problematic drinking behaviors which may appear later in life (Read, Kahler, Strong and Colder, 2006).

Health communication practitioners communicate threatening messages with the purpose of getting the attention of the public in an overcrowded media context. These are known as fear appeals, as they arouse fear to allow practitioners to reach the population to inform them about the social and health risks coming from some unhealthy behaviors (Baron, Logan, Lilly, Inman and Brennan, 1994). Besides the capacity to reach big audiences, fear appeals also lead to negative consequences as the target group showing resistance to the emotions presented, and

more specifically reactance, which leads to very low effectiveness of the message (Richards & Banas, 2015).

Health communication campaigns are often perceived as threatening by their target audience (Hendriks & Janssen, 2018). The level of threat perceived in the message influences the receivers' reaction. If the receivers feel their freedom is been restricted, the threatening perception of the message will be higher than if they do not feel that way (Brehm, 1966). In their study, Witte and Allen, distinguish high threatening messages (e.g. alcohol abuse leads to mortal cancer) from low threatening messages (e.g. alcohol abuse leads to irrational behavior) depending on how severe the consequences of the unhealthy behavior stated in the message are (2000). Different levels of threat are believed to elicit different types of reaction and influence persuasion in a different way. In any case, the threat of a message depends on the receiver's perception, which means that the severity of the consequences is assessed by the audience of a campaign.

The ongoing project aims to provide more insights on how to communicate anti-alcohol abuse messages through fear appeals in a way that allows health communication practitioners to reach the young population, as well as to mitigate the defensive responses presented by the youngsters and therefore increase the effectiveness of these campaigns.

2.2 Resistance strategies

The term resistance has received different definitions over the years but all of them respond to the idea of opposing and withstanding other's influence (Knowles & Linn, 2004). The resistance presented by the receivers of a message is known to be negatively correlated to the effectiveness of the persuasive message. This means, the higher the resistance presented by the receivers, the lower the persuasion (Knowles & Linn, 2004). Therefore, it can be stated that resistance has a main role in any persuasive intent, which makes it an important subject of study for health communication researchers. Surprisingly, the resistance process has been largely overlooked in health communication research until now. Part of the present research is to analyze not only the resistance presented by participants in response to anti-alcohol abuse messages but also the different types of resistance elicited and its relationship with persuasion.

The main purpose of the current research is predicting the different types of resistance strategies elicited by threatening messages about the consequences of alcohol abuse and to understand how they affect persuasion. This requires a method to differentiate these different tactics in which resistance is shown by the target group. I consider the ACE (Avoidance, Contesting, Empowering) model described in the paper by Fransen et al. (2015), the most suitable to classify the different responses of the participants into three main categories of resistance types.

ACE is a model conceived for marketing research, which is used to study resistance to marketing communication messages (e.g. advertisements). Fransen et al. (2015) propose the ACE typology to identify the three main categories of resistance participants can present to a persuasive message: "avoiding, contesting and empowering". They further explain that each of these three categories also includes three subcategories: physical, mechanical or cognitive avoidance, contesting the content, the source or the persuasive tactics, and empowering through attitude bolstering, social validation or self-assertion Fransen et al. (2015).

An especially interesting way in which people show resistance for the current research is contesting the message. In my opinion, contesting the message strategy is extremely important in health communication since communication practitioners rely on their arguments to elicit behavioral and attitudinal change. This strategy, also investigated for marketing purposes, is based on challenging the content of the ads or communications, as well as the source and the persuasive tactics used for it (Fransen et al., 2015). Contesting the content of a message is also known as counter-arguing and it is used by people who try to give reasons refuting the arguments against their position. Receivers can also discredit the source to show that their position and attitude are the correct ones. In this strategy also known as "source derogation", the expertise and the motives of the source are usually queried (Jacks & Cameron, 2003). Furthermore, when consumers are suspicious and perceive the communication tactics as manipulative, they may not agree with the arguments and not show any behavioral or attitudinal change (Fransen et al., 2015). The current investigation focuses especially on source derogation and counter-arguing since these are the two categories expected to be mitigated with the use of humor related to the content and the source of the message.

In addition to contesting the message, ACE also entails avoidance and empowering tactics. Avoidance has been broadly studied by marketing researchers as young populations are eager to avoid all the information not fitting with their attitude and beliefs (Freedman & Sears, 1965). Fransen et al. (2015) specify three ways in which receivers can avoid a message. One of the most common is physical avoidance, which implies to lose contact with the message. For instance, turning off the electronic device in which the message is shown or not looking at the persuasive message. Another tactic, mechanical avoidance, is involuntary and appears when people zap or zip during commercial breaks (Sternberg, 1987; Tse & Lee, 2001), or in a computer zapping to different windows. However, physical and mechanical avoidance are difficult to measure in an electronic experiment context as the one designed for the current research. Therefore, these two types of avoidance will be measured by asking the participant's avoiding intentions while reading the persuasive message. The third strategy is cognitive avoidance and it is related to the way receivers pay attention to the persuasive messages, resulting in "selective exposure" and "selective attention" (Fransen et al., 2015) to avoid the arguments presented in the message. Even if these examples are originally related to the marketing field, based on Van't Riet and Ruiter (2013), it is my belief that the same processes occur when receivers are exposed to health communication messages. For example, if someone who usually incurs in binge drinking is confronted with an anti-alcohol campaign, he may just not listen or look at it.

The third type of resistance strategies in the ACE model, empowering tactics, is also believed to be of interest for health communication purposes. Empowering tactics depend on the receivers themselves, rather than the message and its arguments. One of the most common empowering strategies is attitude bolstering, consisting of defending one's attitudes and beliefs without clearly refuting the persuasive message (Fransen et al., 2015). Another strategy to empower one's behavior is social validation. This is based on using significant others to validate your current attitude and behavior (Jacks & Cameron, 2003) since people following this tactic feel supported by relevant persons believing and acting in the same way as they do (Jacks & Cameron, 2003). For instance, if someone's best friend drinks more than 3 glasses of alcohol in every occasion he goes out and defends this is not a problem at all, a person could rely on the best friend's behavior to be empowered and affirm his behavior is the correct one. Asserting the self is the last of the empowering strategies and it is used by people feeling comfortable with

their behavior. In this case, receivers usually argue that there is no way in which a persuasive intent can influence their attitude and behavior (Fransen et al., 2015).

Apart from the ACE model, the current study also measures the mechanisms of resistance and persuasion when participants present negative affect type of resistance. This strategy makes the receiver of a message "angry, irritated or upset" (Jacks & Cameron, 2003) and there is no doubt it must be taken into account for the investigation. Young people confronted with threatening messages against their current behavior can respond with negative affect.

The three resistance typologies in the ACE model and negative affect are likely to appear in a young target group when they are confronted with a message explaining the negative consequences of alcohol abuse, similarly to Jacks and Cameron (2003), who studied the variety of resistance strategies presented in response to persuasive health challenges. Jacks and Cameron (2003) results show that strategies focused on the message (e.g. counter arguing or attitude bolstering) are most likely to occur, specifically, attitude bolstering was the most repeated among the participants in Jacks and Cameron (2003). Similarly, this project's purpose is to understand which the most common resistance strategies are when a young audience is confronted with anti-alcohol abuse messages and test whether attitude bolstering is the most likely to appear as it happened in (Jacks & Cameron, 2003).

H1: Anti-alcohol abuse messages lead to more cases of attitude bolstering resistance than the other types of resistance entailed in the ACE model and negative affect.

2.3 Resistance affecting persuasion

Persuasive health campaigns are often communicated with the objective of producing an attitudinal change and more positive behavior intent in their audiences (Witte & Allen, 2000). Based on this, it can be stated that persuasion is a process in which attitudinal change and behavior intent play a main role and in which high levels in both of them indicate high levels of persuasion. These two concepts are used as indicators of persuasion in the present study.

To understand the relationship between resistance and persuasion, studies as Jacks and Cameron (2003) have studied this phenomenon and have pointed out different connections between several resistance strategies and persuasion. Jacks and Cameron (2003) support that different types of resistance influence persuasion in different ways. For instance, Jacks and

Cameron (2003) found that contesting strategies as counter arguing have higher effectiveness in resisting persuasion, and therefore lead to less behavioral change intentions. One of the main purposes of the study is to gain more insights on the relationship between different resistance strategies and persuasion. Based on the previous literature, I expect receivers who presented contesting resistance to the anti-alcohol abuse message to rank lower in attitudinal change and to present unhealthier behavioral intentions than the ones presenting either avoidance or empowering strategies.

H2: High levels of contesting resistance predict lower attitudinal change and unhealthier behavioral intentions than high levels of avoiding strategies, empowering strategies and negative affect.

Even if high resistance produces low persuasiveness, it has been supported that when threatening messages which are supposed to create a high resistance are combined with other factors as humor, positive behavioral change can be elicited (Witte & Allen, 2000). The current investigation studies how and why the persuasion can be favored by humor. Furthermore, I aim to explore and understand the implications of using humor in persuasive health communication and especially test whether it may mitigate specific types of resistance strategies.

2.4 Humor in health messages

Providing health communication messages with humorous content can mitigate the negative responses and reactions to a health persuasive message (Hendriks & Janssen, 2018), and therefore make the health message more effective. Humor facilitates the processing of threatening health information since it may distract the receivers from the emotions (fear) they are exposed to (Hendriks & Janssen, 2018). Accordingly, humor is proposed as a moderator of the effect of the threat of the messages on the types of resistance participants will present in the current study. The research's intention is to contribute to the literature about the interaction between threat and humor in persuasive health communication, testing whether different types of humor interact differently with threatening messages, eliciting different types of resistance.

To date, little research has been conducted on the interaction between threat and humor on persuasion and it has largely overlooked the importance of this interaction on eliciting different resistance types. The few studies conducted (Mukherjee & Dubé, 2012; Yoon &

Tinkham, 2013) supported that persuasive messages were more effective when combining humor and high threat. For instance, Mukherjee and Dubé (2012) support that the increment of threat in the message elicits lower effectiveness of persuasion when humor is absent. However, when humor is present, the increment of threat in the message leads to higher persuasion effectiveness than when the threat is low. Yoon and Tinkham (2013) also support that humor helps highly threatening messages to be especially persuasive. Despite these two studies being conducted in the marketing field, it is my belief that they are also relevant for health communication. However, both focused on persuasion rather than on resistance.

Gaining more insights on an intermediate step between threat and persuasion, as it is resistance (Jacks & Cameron, 2003), is part of this project. Hence, the interaction between threat and humor is tested on resistance with anti-alcohol abuse messages. Similar effects as the ones in Mukherjee and Dubé (2012) are expected to be found on resistance.

H3: Humor moderates the effect of threat on resistance, in that high threat results in less resistance when humor is present than when humor is absent

To understand the different ways in which humor can act in persuasive health communication eliciting or mitigating resistance, first, it is important to understand the two routes for persuasion since different types of humor can be helpful to persuade from either one or the other route, which may be related to different resistance types. Petty, Cacioppo and Goldman (1981), explain that there are two paths in which a person can be persuaded. On the one hand, there is the so-called central route in which the receivers of a message evaluate the arguments presented in it. When someone is confronted with a message trying to persuade him from the central route, the receiver will thoughtfully considerate the arguments and will base his attitudinal change and behavioral intentions on the core arguments of the message (Petty et al., 1981). On the other hand, there is a different route in which persuasion may occur through peripheral cues related to the situation in which the persuasion message appears. This is the so-called peripheral route and it works through situational aspects as the credibility, attractiveness, and power of the source. In this case, the receiver of a threatening message ponders these secondary aspects of the message rather than the core arguments (Petty et al., 1981).

Communication practitioners use different techniques to maximize the persuasiveness of both the central and peripheral route of persuasion and the use of humor can be effective through

both paths (Lyttle, 2001). This means, humor can be effective if it is related to the core arguments or content of the message, but also when it is related to other aspects as the source (Hennigan, Cook, and Gruder, 1982) or situational factors (Jorgensen, 1996). Hence, I am convinced that different resistance strategies related to either the core arguments or peripheral cues can be presented depending on the route in which the message has been designed to persuade.

Using humor to increase the likability of the source of the message, which is a way to persuade through the peripheral route, is a common technique among communication practitioners aiming to persuade their audience (Lyttle, 2001). A proper message aiming to increase the source likability should illustrate a source perceived as likable thanks to shared humor and values between sender and receiver (Meyer, 1997). Therefore, a humorous source may reduce the resistance of the receiver and especially source derogation. To create a more likable source, studies such as Burns (1999) suggest using cartoons together with the message to make the persuasive message more effective. It should be noted that these cartoons must be well-known among the receivers of the message for the source to be perceived as likable. In the analysis, I expect to find less source derogation to an ad in which the message appears close to a well-recognized cartoon increasing the likeability of the source. This study compares ads in which humor is connected to the source with others in which humor is either connected to the content or absent.

H4: When humor is connected to the source of the message, it produces a lower amount of source derogation than when humor is connected to the content of the message or humor is absent

Humor may also be effective to reduce persuasion when it is present in the content of the message. Humorous content is thought to act as a distraction from the threat of a message. This idea of distracting as an effective way to increase persuasiveness has been broadly studied and supported in the advertising field in studies as Osterhouse and Brock (1970). In their research, the authors found that participants showed less counter-arguing responses if they were distracted while they were exposed to messages opposed to their beliefs. Due to the similarities between advertising persuasive messages and health communication ones, it is my perception that using

humor as a distraction can mitigate resistance and reduce counter-arguing when communicating alcohol prevention campaigns.

Lyttle further explains that the effects of the distraction might be especially stronger when the message contains ironic humor (2001). According to the Oxford dictionary, ironic humor is based on "expression of one's meaning by using language that normally signifies the opposite, typically for humorous or emphatic effect". This type of humor creates a bigger distraction since it requires a higher comprehension capacity for the receivers while they are being distracted, which leads to higher persuasiveness. The current research also focuses on ironic content to create a big distraction from the threat of the alcohol preventive message. Getting participants distracted, I expect to find less counter-arguing and an especially reduced amount of counter-arguing responses. This study compares ads in which humor is connected to the content with others in which humor is either connected to the source or absent.

H5: When humor is connected to the content of the message, it produces a lower amount of counter-arguing than when humor is connected to the source of the message or humor is absent

As part of the investigation is exploratory, one of the main purposes is to find out which the effects of humor and threat on the different types of resistance strategies in the ACE model and negative affect are. This effect of humor and threat on eliciting different resistance strategies and how these strategies may mediate on persuasiveness, as it can be found in Figure 1, have been largely overlooked by research until the date and the current study aims to understand how these relations work. Therefore, the research questions previously mentioned must be tested:

RQ1: To what extent do humor connected to the message source and humor connected to the message content reduce different types of resistance in response to a threatening health message?

RQ2: To what extent do the different types of resistance predict persuasion?

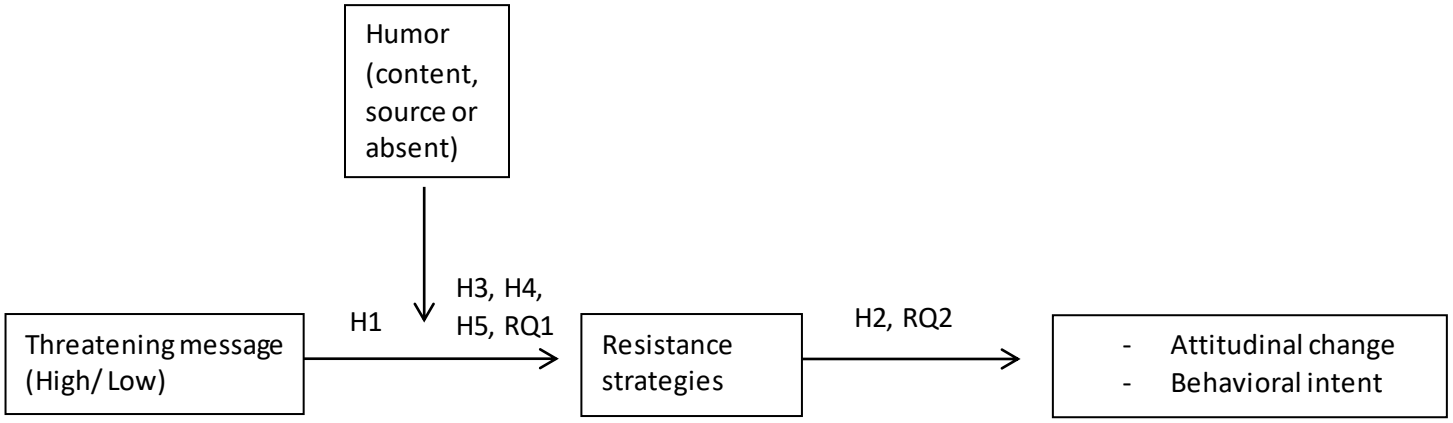


Figure 1 Conceptual model

3. Method

This section explains the details about participants, design, stimuli, and measures for the current research.

3.1 Participants and design

As alcohol abuse prevention campaigns are especially needed among youngsters, due to their high vulnerability (Simons-Morton et al, 1997) to alcohol abuse consequences, having a large amount of young people (between 18 and 30) was a priority in the current research sample. A convenience sample was used with the participants using the social media platforms Facebook and Whatsapp, as well as the survey exchange platforms Surveycircle and Surveyswap, where the participants received an invitation to participate in the experiment through the Qualtrics tool.

In total 284 participants took part in the study. However, twelve of them did not complete the study. Hence the expectations of having minimum 240 participants (as the current research entails 6 conditions, 40 participants per condition are a fair amount to foster the validity of it and get valuable insights after the multiple mediation analysis) were met. Participants were on average 26.35 years old (*SD* = 7.30) (105 male, 167 female and 12 unknown).

As shown in Figure 1, the current research is a 2 (high threat vs. low threat) x 3 (humor absent vs. content humor vs. source humor) between-subjects experimental design. One of the six health messages was shown to each participant combining high and low threatening messages

with humorous content, humorous source, and humor absent. The division between the 6 conditions was not equal but each condition had at least 40 respondents.

3.2 Stimuli

The messages were presented as an image which could appear in any social media platform, either combining a text and a cartoon or showing just a text. The health messages shown in the experiment informed about the consequences of alcohol abuse among the population, trying to convince the receivers to change their behavior and attitude towards alcohol into healthier ones.

The manipulation of threat and humor in the message resulted in six manipulated versions of the message. Firstly, these versions varied in the extent of threat, with three messages communicating highly severe consequences of alcohol abuse and three messages communicating less severe consequences. Each of the three messages per threat condition was combined with a different humor condition. The six message versions also varied in the type of humor they presented. Two messages were written in an ironical way to fit the content humor type, two messages included a cartoon to make the source humorous and the last two messages were written in a way avoiding any type of humor. Each of the pairs was combined with the threat conditions. Participants were randomly assigned to conditions through the Qualtrics tool, allowing each participant to respond to only one condition.

To emulate a social media publication, a logo and name related to a Health association (Alcohol Focus Scotland) were used in the image containing the message shown to participants. For the different humor conditions, different images were created based on Burns (1999), who used cartoons for the source humor condition. To this end, different designs with several cartoons were pretested to know which would fit better the idea of the humorous source. After the results of the pretest, it was decided to use a design including a well-known cartoon character as Homer Simpson $M = 4.00$ ($SD = 2.59$) complementing the high threatening message and also the same cartoon, Homer Simpson $M = 4.20$ ($SD = 2.47$), complementing the low threat message. As suggested in Lyttle (2001), an ironic message was shown for the content humor condition. Different ironical messages were pretested in order to choose the best one for the humorous content purpose. As a result, the selected ironic message for the high threat condition $M = 3.30$ ($SD = 2.25$) and the one for the low threat condition $M = 4.05$ ($SD = 1.86$), were perceived as the

most humorous content. The stimuli for the absent humor condition presented a high and a low threatening message without any type of humor. All the stimuli can be found in Appendix A.

The design of the messages for the threat condition was done following the guidance of Witte and Allen (2000), who explained that the threat of a message can be distinguished by the severity of the consequences expressed. After the pretest, the messages suggesting cancer and stroke risks as consequence $M = 3.94$ ($SD = 1.24$) were reported to be significantly more threatening than those suggesting irrational behavior as a consequence $M = 2.92$ ($SD = 1.06$) $p = .03$. These threat manipulations can be found in Appendix A.

3.3 Measures

3.3.1 Manipulation Check of the threatening message

To make sure participants perceived the message as respectively high and low threatening, respondents' perceived threat was measured with 4 items on a 7-point Likert scale (e.g., The ad scares me). This scale was used by Hendriks and Janssen (2018) in their study. The mean of the scale was 2.34 ($SD = 1.50$) and the reliability of the scale was good, $\alpha = .96$.

3.3.2 Manipulation check of humor

To check whether participants perceived the ads as humorous, they were asked to answer to two items on 7-point scales ranging from 1-most certainly not, to 7-most certainly (e.g. "I find the ad humorous") how funny they considered the ad. This scale was also derived from Hendriks and Janssen (2018) in their study. The mean of the scale was 3.29 ($SD = 2.04$) and the reliability of the scale was good, $\alpha = .96$.

3.3.3 Resistance strategies

To measure the different types of resistance shown by participants, they were asked additionally to answer an open-ended thought listing question about what and how they felt after being exposed to the message. After coding the thought-listing questions, it must be said that 212 participants, (74.6% of the sample) did not present any resistance. The thought listing coding was done by the main investigator in the current research and 10% was also done by a second coder, following the coding scheme which can be found in Appendix D. The inter-coder reliability was very high with the Cohen's Kappa < .001, which means that the answers given by

the participants were classified in a way fitting one of the 3 ACE types of resistance and its appropriate subcategory.

Furthermore, participants were asked to answer on 7-point Likert scales about each of the resistance strategies of the ACE model and negative affect.

Avoiding was measured with two items based on the ones in Jacks and Cameron, (2003) measuring physical avoidance (e.g. I felt like ignoring the message) and cognitive avoidance (I tuned out the arguments contradicting my opinion about drinking alcohol) separately on a 7 point Likert scale (1 = totally disagree; 7 = totally agree). The reliability of the scale was not good enough (α = .45). Because of the low reliability, the two items will also be analyzed separately. On average, participants scored a 3.74 (*SD* = 1.32) on avoiding resistance strategies. Given that it was measured on a 7-point scale, this means that people got medium-low scores on this scale.

Contesting was measured combining one item (e.g. I thought the sender was using persuasive tactics) measuring persuasive tactics contesting type of resistance developed after the items in Jacks and Cameron (2003), with the means for counter-arguing and source derogation. The reliability of these three items measuring the contesting typology was not good enough (α = .25). Message derogation scale was measured with five bipolar items by Jenkins & Dragojevic (2011) (e.g. I think the arguments in the message are unreasonable/ reasonable). The reliability of this scale was very good (α = .95). Source derogation was measured with five bipolar items developed after Jacks and Cameron (2003) (e.g. I think the sender of the message is credible/ not credible). The reliability of the scale was also high (α = .95). On average, participants scored a 3.51 (*SD* = 1.00) on the contesting resistance strategies. Given that it was measured on a 7-point scale, this means that people got medium-low scores on this scale.

Empowering was measured with four items of which two items (e.g. I thought about arguments or reasons supporting what I believe about alcohol consumption) measured attitude bolstering, 1 item (e.g. I thought about other people who share my convictions about alcohol consumption) measured social validation and one item (e.g. I thought there is nothing the other people can say that will change my mind about alcohol consumption) measured self-assertion. The reliability of the scale was not good enough (α = .54). Because of the low reliability, the four items will also be analyzed separately. On average, participants scored a 3.78 (*SD* = 1.02) on the

empowering resistance strategies. Given that it was measured on a 7-point scale, this means that people got medium-low scores on this scale.

Negative affect was measured with six items developed after Jacks and Cameron (2003) "While viewing the ad I felt annoyed/ irritated/ bored/ uneasy/ anxious/ uncomfortable" on a 7 point Likert scale (1 = not at all; 7 = very much). The reliability of the scale was good (α = .83). On average, participants scored a 2.93 (*SD* = 1.31) on the negative affect resistance strategies. Given that it was measured on a 7-point scale, this means that people got medium-low scores on this scale.

Also, to get an overall measure of the resistance presented by participants, the last scale overall resistance was computed with the mean of all the types of resistance together (α = .49). Because of the low reliability, the six items will also be analyzed separately.

3.3.4 Persuasion; attitudinal change, and behavioral intent

According to the Dietary Guidelines for Americans 2015-2020, up to 2 glasses of alcohol can be considered moderate drinking. Hence, this study uses this measure as a cutting point to state what alcohol abuse is and what is not. The participants' attitude towards alcohol abuse was measured before and after the exposure to the message as the mean of six items developed from the study by Hendriks and Janssen (2018) "Drinking more than 2 alcoholic drinks on one occasion is sociable/ irresponsible/ damaging/ enjoyable/ unhealthy/ fun" on 7-point Likert scale (1 = completely disagree; 7 = completely agree). The attitudinal change was computed after the subtraction of the first values (before exposure to the message) for attitude towards alcohol abuse from the second values (after exposure to the message) for attitude towards alcohol abuse. The attitude scale after the message exposure had good reliability (α = .69), as well as the attitude scale prior to the message exposure (α = .72) Finally, the average attitudinal change was -0.33 (*SD* = 0.74), which means that the persuasive message generally produces slightly unhealthier behaviors or no change at all.

The participants' behavioral intent towards alcohol abuse was measured at the end of the experiment computing the mean of two items also developed from the study by Hendriks and Janssen (2018) "The next time that I drink alcohol, I intend to/ I will drink responsibly (not more than 2 drinks)" on 7-point Likert scale (1 = completely disagree; 7 = completely agree). The

behavioral intent scale had good reliability (α = .97) and the average behavioral intent was 3.92 (*SD* = 1.85),

3.3.5 Controlling for current use of alcohol

Other variables are also measured for control purposes in the current experiment. This is the case for the current use of alcohol for which participants answer to the question "How much do you drink on an average occasion in which you drink alcohol?" on a multiple choice basis (1 = I don't usually drink alcohol; 7 = 6 or more glasses of alcohol).

3.4 Procedure

The experiment began with an informed consent which must be agreed to participate. After the informed consent participants could see the email of the main investigator in case they had questions about the experiment or they wanted to know more about it.

Subsequently, current attitude towards alcohol was measured before the exposure to the manipulations. Several questions about resistance were asked after the exposure to the manipulation and at the end of the experiment, participants had to answer some more questions about their behavior intent and attitude towards alcohol.

3.5 Analysis

To analyze the relationship between the resistance strategies and persuasion, four regression analyses with avoiding, contesting, empowering and negative affect strategies were conducted on attitudinal change as the dependent variable and other four regression analyses on behavior intent as a dependent variable.

Lastly, to understand the effects of humor and threat on the different resistance strategies, six factorial ANOVAs were conducted on source derogation, counter-arguing, avoiding, contesting, empowering and negative affect strategies as dependent variables. Also, another factorial ANOVA was conducted on the overall resistance.

4. Results

4.1 Manipulation checks

To test the effects of humor and threat on the different resistance types and the effects on attitudinal change and behavioral intent, first I need to assess whether the manipulations were properly perceived by the participants.

Humor

The data for humor is not normally distributed, but an ANOVA is fairly robust against the violation of this assumption. To assess the success of the humor manipulation, a one way ANOVA was performed with humor as the independent variable and the perception of humor by the participants as a dependent. The assumption of homogeneity was not met. Therefore, *Welch* and *Games-Howell* values will be reported for the test results and post hoc.

The ANOVA showed a significant effect of type of humor in the ad $F(2,167.40) = 64.98$, $p < .001$, $n^2 = .26$. The content humor ads ($M = 3.73$, $SD = 1.92$) were not perceived differently than the source humor ads ($M = 4.30$, $SD = 1.97$), $p = .113$. Content humor ads were perceived as significantly more humorous than the absent humor ones ($M = 1.77$, $SD = 1.20$), $p < .001$ and the source humor ads were also perceived as funnier than the absent humor, $p < .001$. Therefore I conclude that the Humor manipulation worked as expected. Therefore, it can be said that manipulation of humor worked as expected.

Threat

The data is not normally distributed so the results after bootstrap will be presented. To assess whether manipulation of threat was successful, an independent samples T-test was performed with threat as the independent variable and the perception of threat by the participants as a dependent.

On average, high threatening ads ($M = 2.57$, $SD = 1.58$) were perceived as more threatening than low threatening ads ($M = 1.91$, $SD = 1.27$). Equal variance between groups was not assumed $F = 9.45$, $p = .002$. This difference was significant ($Mdif = 0.66$, $t(251.53) = -3.71$, $p = .001$) and it does not generalize to the population (95% CI -1.01, -0.35). The difference medium/ large-sized effect $d = .46$. Therefore, it can be said that manipulation of threat worked as expected.

4.2 Types of resistance elicited

The first purpose of the current study is to test H1 stating that anti-alcohol abuse messages lead to more cases of attitude bolstering resistance than the other types, and to investigate which are the most common resistance strategies when young populations are confronted with anti-alcohol abuse messages.

The most common type of resistance coded in the current research was Negative affect, which was presented by 31 participants, 10.9% of the sample. Among the other types of resistance presented, Source derogation, attitude bolstering, and self-assertion were the most common ones appearing approximately 4% of the sample each. *Table 1* shows a full overview of the resistance strategies presented.

With these results, **H1 can be rejected as negative affect and not attitude bolstering is the most common resistance strategy presented.** In any case, note that attitude bolstering was the third resistance type most presented in this sample.

Table 1. *Valid cases and % for types of resistance*

ACE Typology	*Type of resistance*	*N*	*%*
Avoiding	Physical avoidance	0	0
Avoiding	Mechanical avoidance	1	0.4
Avoiding	Cognitive avoidance	2	0.7
Contesting	Source derogation	12	4.2
Contesting	Counter-arguing	4	1.4
Contesting	Persuasive tactics contesting	1	0.4
Empowering	Attitude bolstering	11	3.9
Empowering	Social validation	1	0.4
Empowering	Self-assertion	11	3.9
Negative affect	Negative affect	31	10.9
None	None	212	74.6

As 74.6% of the participants did not show any resistance to the ad, no further analyses were conducted on the types of resistance presented in the thought-listing.

4.3 Control variables

The control variable "current drinking behavior" was measured to assess its impact on behavior intent, attitudinal change, and resistance. As the assumption of normality was not met, several bootstrapped correlation analyses were conducted to look for relationships between "current drinking behavior" and all the dependent variables analyzed in this study.

The correlation analysis showed a significant correlation between the current drinking behavior and the scores for avoiding resistance $r = .178$, $p = .003$. 3.17% of the variance can be therefore explained. The bootstrapped 95% CI [-.53,-.10] does not cross zero, so it seems to be a genuine effect. The analysis also showed a significant correlation between the current drinking behavior and attitudinal change $r = -.314$, $p < .001$. 9.86% of the variance can be therefore explained. The bootstrapped 95% CI [-.53,-.10] does not cross zero, so it seems to be a genuine effect. Furthermore, a last significant correlation between the current drinking behavior and behavior intent $r = -.594$, $p < .001$ was shown. 35.28% of the variance can be therefore explained. The bootstrapped 95% CI [-.53,-.10] does not cross zero, so it seems to be a genuine effect. This means that the variable current drinking behavior will be taken into account in all the analysis including avoiding resistance, attitudinal change or behavior intent.

4.4 Types of resistance and attitudinal change and behavior intent

Second, the current research tests whether the different types of resistance and especially contesting resistance can predict attitudinal change and behavior intent. To do this several regression analyses were conducted for the strategies avoiding, contesting, empowering and negative affect, as well as the control variable current drinking behavior, as predictors of attitudinal change and behavior intent.

To test the first part of H2 stating that high levels of contesting resistance predict lower attitudinal change than high levels of avoiding, empowering strategies and negative affect, four different regression models were built with the scores on avoiding, contesting, empowering and negative affect strategies as independent variables and the attitudinal change scores as the

dependent variable. Furthermore, a regression for the control variable "current drinking behavior" on attitudinal change was conducted and can be found in Appendix B.

Note that the attitudinal change scores measure the difference between the participants' attitude towards drinking after being exposed to the anti-alcohol abuse message and their attitude prior to the message exposure, so positive scores indicate healthy attitudinal change and negative ones unhealthy attitude change.

Avoiding

There were ten cases (3.68%) with standardized residuals larger than 2 and the largest Cook's distance was 0.14, so there are not too many outliers or influential cases. The residuals were independent (Durbin-Watson = 1.77), but the distribution of the residuals showed kurtosis (*z-score kurtosis* = 13.61). Therefore, a bootstrapped regression analysis was conducted to get the confidence interval of the coefficient. The bootstrapped 95% confidence interval ranged from -0.08, 0.06 so I can be 95% confident that avoiding resistance is not related to attitudinal change. Avoiding resistance was not supported to be a significant predictor of attitudinal change (b = -0.02, β = -.03).

As the reliability for the avoiding scale was not good enough, the same analyses were also conducted on the two types of resistance entailed in the avoiding typology measured in the current study (physical and cognitive avoidance). No predictions on attitudinal change were found for neither of them.

Contesting

There were eleven cases (4.04%) with standardized residuals larger than 2 and the largest Cook's distance was 0.05, so there are not too many outliers or influential cases. The residuals were independent (Durbin-Watson = 2.07), but the distribution of the residuals showed kurtosis (*z-score kurtosis* = 13.49). Therefore, a bootstrapped regression analysis was conducted to get the confidence interval of the coefficient. The bootstrapped 95% confidence interval ranged from -0.04, 0.12 so I can be 95% confident that contesting resistance is not related to attitudinal change. Contesting resistance was not supported to be a significant predictor of attitudinal change (b = 0.04, β = .05).

As the reliability for the contesting scale was not good enough, the same analyses were also conducted on the three types of resistance entailed in the contesting typology (counter arguing, source derogation and persuasive tactics contesting). No predictions on attitudinal change were found for neither of them.

Empowering

There were ten cases (3.68%) with standardized residuals larger than 2 and the largest Cook's distance was 0.36, so there are not too many outliers or influential cases. The residuals were independent (Durbin-Watson = 2.08), but the distribution of the residuals showed kurtosis (*z-score kurtosis* = 11.80). Therefore, a bootstrapped regression analysis was conducted to get the confidence interval of the coefficient. The bootstrapped 95% confidence interval ranged from -0.06, 0.18 so I can be 95% confident that empowering resistance is not related to attitudinal change. Empowering resistance was not supported to be a significant predictor of attitudinal change (b = 0.06, β = .09).

As the reliability for the empowering scale was not good enough, the same analyses were also conducted on the three types of resistance entailed in the empowering typology (attitude bolstering, social validation, and self-assertion). No predictions on attitudinal change were found for neither of them.

Negative affect

On average, participants scored a 2.93 (SD = 1.31) on the negative affect resistance strategies. Given that it was measured on a 7-point scale, this means that people got medium-low scores on this scale. There were ten cases (3.68%) with standardized residuals larger than 2 and the largest Cook's distance was 0.42, so there are not too many outliers or influential cases. The residuals were independent (Durbin-Watson = 2.07), but the distribution of the residuals showed kurtosis (*z-score kurtosis* = 13.68). Therefore, a bootstrapped regression analysis was conducted to get the confidence interval of the coefficient. The bootstrapped 95% confidence interval ranged from -0.11, 0.06 so I can be 95% confident that negative affect resistance is not related to attitudinal change. Negative affect was not supported to be a significant predictor of attitudinal change (b = -0.03, β = -.04).

Hence, these results do not support the first part of H2 since none of the resistance types were supported to predict any attitudinal change.

To test the second part of H2 stating that high levels of contesting resistance predict unhealthier behavioral intentions than high levels of avoiding, empowering strategies and negative affect, four different regression models were built with the scores on avoiding, contesting, empowering and negative affect strategies as independent variables and the attitudinal change scores as the dependent variable. Furthermore, a regression for the control variable "current drinking behavior" on behavior intent was conducted and can be found in Appendix B.

Note that the behavioral intent measures the participants' intention towards alcohol consumption after being exposed to the anti-alcohol abuse message, so higher scores indicate healthier behavioral intent.

Avoiding

There was one case (0.37%) with standardized residuals larger than 2 and the largest Cook's distance was 0.04, so there are not too many outliers or influential cases. The residuals were independent (Durbin-Watson = 2.08), but the distribution of the residuals showed kurtosis (*z-score kurtosis* = -3.00). Therefore, a bootstrapped regression analysis was conducted to get the confidence interval of the coefficient. The bootstrapped 95% confidence interval ranged from -0.40, -0.04 so I can be 95% confident that avoiding resistance predicts behavioral intent in a way that higher resistance produces unhealthy behavioral intent. This means the higher avoiding resistance, the unhealthier behavioral intent. Avoiding resistance was supported to be a significant predictor of behavior intent (b = -0.23, β = -.163).

As the reliability for the avoiding scale was not good enough, the same analyses were also conducted on the two types of resistance entailed in the avoiding typology. This means that 2 regression analyses were conducted for physical and cognitive avoidance on behavior intent. The results supporting the prediction of physical avoidance on behavior intent can be found in Appendix B.

Contesting

There were no cases with standardized residuals larger than 2 and the largest Cook's distance was 0.06, so there are not too many outliers or influential cases. The residuals were independent (Durbin-Watson = 2.10), but the distribution of the residuals showed kurtosis (*z-score kurtosis* = -3.20). Therefore, a bootstrapped regression analysis was conducted to get the confidence interval of the coefficient. The bootstrapped 95% confidence interval ranged from -0.27, 0.22 so I can be 95% confident that contesting resistance is not related to attitudinal change. Contesting resistance was not supported to be a significant predictor of attitudinal change (b = -0.03, β = -.01).

As the reliability for the contesting scale was not good enough, the same analyses were also conducted on the three types of resistance entailed in the contesting typology. This means that three regression analyses were conducted for counter-arguing, source derogation and persuasive tactics contesting on behavior intent. The results supporting the prediction of counter-arguing and persuasive tactics contesting on behavior intent can be found in Appendix B.

Empowering

There were no cases with standardized residuals larger than 2 and the largest Cook's distance was 0.06, so there are not too many outliers or influential cases. The residuals were independent (Durbin-Watson = 2.10), but the distribution of the residuals showed kurtosis (*z-score kurtosis* = -3.21). Therefore, a bootstrapped regression analysis was conducted to get the confidence interval of the coefficient. The bootstrapped 95% confidence interval ranged from -0.23, 0.26 so I can be 95% confident that empowering resistance is not related to behavioral intent. Empowering resistance was not supported to be a significant predictor of behavior intent (b = 0.02, β = .01).

As the reliability for the empowering scale was not good enough, the same analyses were also conducted on the three types of resistance entailed in the empowering typology (attitude bolstering, social validation, and self-assertion). No predictions on behavior intent were found for neither of them.

Negative affect

There were no cases with standardized residuals larger than 2 and the largest Cook's distance was 0.06, so there are not too many outliers or influential cases. The residuals were independent

(Durbin-Watson = 2.09), but the distribution of the residuals showed kurtosis (*z-score kurtosis* = -3.21). Therefore, a bootstrapped regression analysis was conducted to get the confidence interval of the coefficient. The bootstrapped 95% confidence interval ranged from -0.21, 0.14 so I can be 95% confident that negative affect resistance is not related to attitudinal change. Negative affect was not supported to be a significant predictor of behavior intent (b = -0.03, β = -.02).

Hence, these results do not support the second part of H2. Avoiding strategies is the only resistance strategy predicting a less desirable behavioral intent. Furthermore, no analyses on the full model are done in the current study due to the lack of relation between resistance strategies and persuasion.

4.5 Effects of humor and threat on overall resistance

After the confirmation of the success of the manipulation, I proceed to analyze the effects of threat and humor in the overall resistance to test H3 stating that humor moderates the effect of threat on resistance, in that high threat results in less resistance when humor is present than when humor is absent. Even if the scale overall resistance was not reliable, this scale is necessary to test H3. Furthermore, a separate analysis of each type of resistance will be provided in section 4.6.

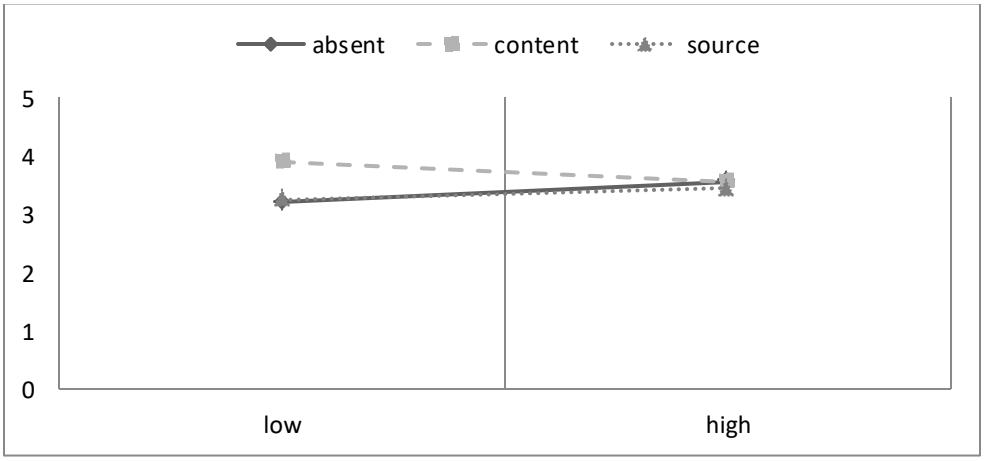
The scores for overall resistance were not normally distributed. However, the ANOVA is fairly robust against these violations but the outcomes may not be completely reliable. A factorial ANOVA was performed with the independent variables humor and threat and the dependent variable overall resistance. There was a significant main effect of humor $F(2,252)$ = 7.57, p = .001 n^2 = .06. Resistance was significantly higher for the people who saw the content humor ad (M = 3.71, SD = 0.77), than for the ones who saw either the absent humor ad (M = 3.37, SD = 0.79) p = .003 and higher for content humor than for the source humor ad (M = 3.36, SD = 0.62) p < .001. Furthermore, no main effect of threat was found $F(1,252)$ = 0.56, p = .454 Finally, there was an interaction effect between threat and humor $F(2,252)$ = 5.28, p = .006 n^2 = .04.

This interaction effect was further explored through simple effect analysis of the threat level in combination with each level of the other factor 'humor type'. The first contrast 'absent humor' show a significant difference: $F(1,252)$ = 4.32, p =.039 depending if the threat is high or

low. The second contrast, 'content humor' also does show a significant difference: $F(1,252) = 4.86$, $p = .028$ when the threat is high or low. The third contrast, 'source humor' in combination with threat level, however, does not show a significant difference: $F(1,252) = 1.83$, $p = .177$. These contrasts show that when humor is absent, there is a significant difference between the threat levels, in a way that high threat elicits more resistance. However, when there is humorous content in the ad the low threat ads are the ones eliciting significantly higher resistance, as it can be seen in *Figure 2*.

The interaction effect was also explored through simple effect analysis of the source type in combination with each level of threat. The first contrast low threat in combination with the types of humor did show a significant difference: $F(2,252) = 11.59$, $p < .001$. The second contrast, high threat in combination with the types of humor did not show a significant difference: $F(2,252) = 0.44$, $p = .646$.

Figure 2. *Interaction of humor and threat on the overall resistance*



These results cannot support H3 since humor does not elicit lower resistance than no humor when the threat of the message is high.

4.6 Effects of humor and threat on resistance types

To test H4 stating that humor connected to the source produces a lower amount of source derogation than when humor is connected to the content or humor is absent, a factorial ANOVA with humor and threat as independent variables and source derogation as dependent variable was conducted.

The Source derogation scores were normally distributed and the assumption of homogeneity was met. A factorial ANOVA was performed with the independent variables humor and threat and the dependent variable source derogation. There was a significant main effect of humor $F(2,252) = 3.96$, $p = .020$ $n^2 = .03$. The source derogation scores were not significantly lower for the people who saw the source humor ad ($M = 3.71$, $SD = 1.60$) than those who saw the content humor ad ($M = 3.87$, $SD = 1.57$) $p = .333$, but scores were slightly significantly higher for people exposed to source humor than for the ones who saw the absent humor ad ($M = 3.25$, $SD = 1.23$) $p = .054$. These results are against the expectations in **H4, indeed humorous source elicited more source derogation than humor absent and similar source derogation as humorous content**. Furthermore, no main effect of threat was found $F(1,252) = 0.68$, $p = .412$, as well as no interaction effect between threat and humor $F(2,252) = 2.71$, $p = .069$.

To test H5 stating that humor connected to the content produces a lower amount of counter arguing than humor connected to the source of the message or humor absent, a factorial ANOVA with humor and threat as independent variables and counter-arguing as dependent variable was conducted.

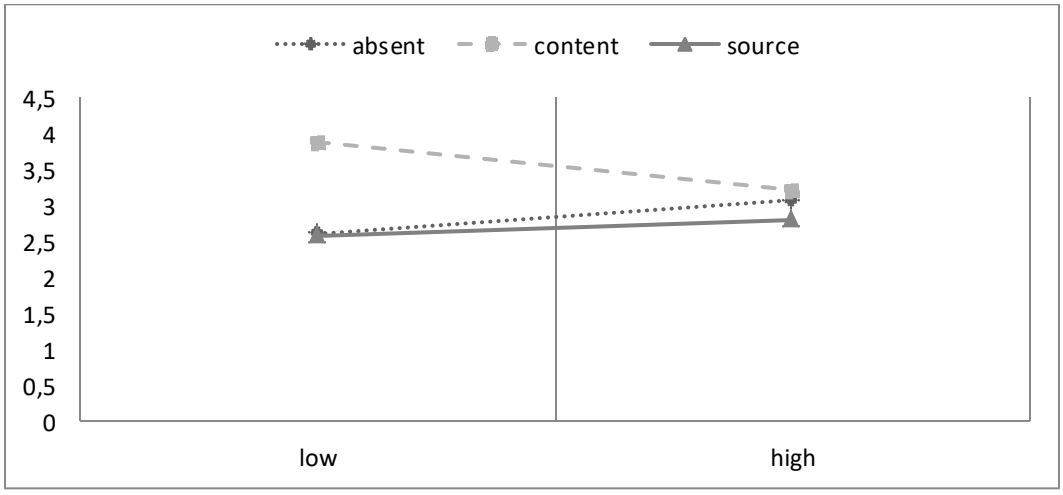
The scores for counter-arguing were not normally distributed and the assumption of homogeneity was not met. However, the ANOVA is fairly robust against these violations but the outcomes may not be completely reliable. A factorial ANOVA was performed with the independent variables humor and threat and the dependent variable counter arguing. There was a significant main effect of humor $F(2,252) = 8.63$, $p < .001$ $n^2 = .06$. The counter arguing scores were significantly higher for the people who saw the content humor ad ($M = 3.51$, $SD = 1.75$) than for the ones who saw the absent humor ad ($M = 2.82$, $SD = 1.14$) $p = .003$ and for content humor than the source humor ad ($M = 2.70$, $SD = 1.40$) $p < .001$. These results are totally against the expectations in **H5, indeed messages with humor connected to the content were the ones eliciting the highest counter-arguing resistance.** Furthermore, no main effect of threat was found $F(1,252) = 0.00$, $p = .980$ but there was an interaction effect between threat and humor $F(2,252) = 3.44$, $p = .034$ $n^2 = .03$.

This interaction effect was further explored through simple effect analysis of the threat level in combination with each level of the other factor ‘humor type’. The first contrast ‘absent

humor' in combination with threat level did not show a significant difference: $F(1,252) = 1.79$, $p = .182$. The second contrast, 'content humor' in combination with threat level did show a significant difference: $F(1,252) = 4.60$, $p = .033$. The third contrast, 'source humor' in combination with threat level does not show a significant difference: $F(1,252) = 0.49$, $p = .484$. These contrasts show that when there is humorous content in the ad the low threat ads are the ones eliciting significantly higher resistance, as it can be seen in *Figure 3*.

The interaction effect was also explored through simple effect analysis of the source type in combination with each level of threat. The first contrast low threat in combination with the types of humor did show a significant difference: $F(2,252) = 10.29$, $p < .001$. The second contrast, high threat in combination with the types of humor did not show a significant difference: $F(2,252) = 1.06$, $p = .348$.

Figure 3. *Interaction of humor and threat on counter-arguing*



Furthermore, four factorial ANOVAs were conducted to answer the explorative research question about the effect of humor and threat on the main resistance strategies in the ACE model (avoiding, contesting and empowering) and negative affect.

Avoiding

The scores for avoiding resistance were normally distributed and the assumption of homogeneity was met. A factorial ANCOVA was performed with the independent variables humor and threat and the dependent variable avoiding resistance, and current drinking behavior as covariate variable. There was no significant main effect either of humor $F(2,250) = 0.87$, p

= .419 or threat $F(1,250) = 0.25$, $p = .619$, as well as no interaction effect between threat and humor was found $F(2,250) = 1.13$, $p = .326$.

As the reliability for the avoiding scale was not good enough, two factorial ANOVAs of threat and humor were also conducted on the two types of resistance entailed in the avoiding typology (physical and cognitive avoidance). No effects of either humor, threat or their interaction were found.

Therefore, it seems that humor and threat do not have an effect on producing avoiding resistance in an anti-alcohol abuse message.

Contesting

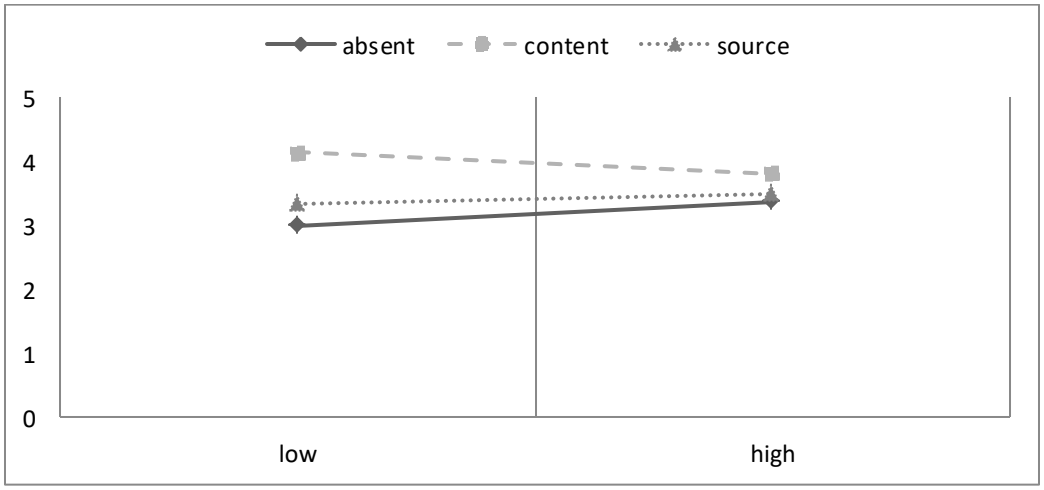
The scores for counter-arguing were not normally distributed. However, the ANOVA is fairly robust against these violations but the outcomes may not be completely reliable. A factorial ANOVA was performed with the independent variables humor and threat and the dependent variable contesting resistance. There was a significant main effect of humor $F(2,252) = 15.36$, $p < .001$ $n^2 = .11$. The contesting resistance was significantly higher for the people who saw the content humor ad ($M = 3.96$, $SD = 1.09$), than for the ones who saw the source humor ad ($M = 3.43$, $SD = 0.87$) $p < .001$ and the absent humor ad ($M = 3.17$, $SD = 0.83$) $p < .001$. Furthermore, no main effect of threat was found $F(1,252) = 0.32$, $p = .573$ but there was an interaction effect between threat and humor $F(2,252) = 3.03$, $p = .050$ $n^2 = .02$.

This interaction effect was further explored through simple effect analysis of the threat level in combination with each level of the other factor 'humor type'. The first contrast 'absent humor' in combination with threat level did not show a significant difference: $F(1,252) = 2.93$, $p = .088$. The second contrast, 'content humor' in combination with threat level, also did not show a significant difference: $F(1,252) = 2.68$, $p = .103$. The third contrast, 'source humor' in combination with threat level does not show a significant difference: $F(1,252) = 0.68$, $p = .410$.

The interaction effect was also explored through simple effect analysis of the source type in combination with each level of threat. The first contrast low threat in combination with the types of humor did show a significant difference: $F(2,252) = 15.42$, $p < .001$. The second contrast, high threat in combination with the types of humor did not show a significant difference: $F(2,252) = 2.51$, $p = .083$.

As seen in *Figure 4* high threat elicited more contesting resistance when the ads contained a humorous source or humor was absent. However, when the ads contained humorous content the resistance elicited was higher when the threat was low. The lowest resistance appeared for low threat and either source or absent humor.

Figure 4. *Interaction of humor and threat on contesting resistance*



As the reliability for the contesting scale was not good enough, three factorial ANOVAs were also conducted for threat and humor on the three types of resistance entailed in the contesting typology (counter-arguing, source derogation and persuasive tactics contesting). These can be found in Appendix C.

Empowering

The scores for counter-arguing were not normally distributed. However, the ANOVA is fairly robust against these violations but the outcomes may not be completely reliable. A factorial ANOVA was performed with the independent variables humor and threat and the dependent variable empowering resistance. There was no significant main effect either of humor $F(2,252) = 0.29$, $p = .745$ or threat $F(1,252) = 0.13$, $p = .717$, as well as no interaction effect between threat and humor was found $F(2,252) = 1.71$, $p = .184$.

As the reliability for the empowering scale was not good enough, three factorial ANOVAs were conducted for threat and humor on the three types of resistance entailed in the empowering (attitude bolstering, social validation, and self-assertion). No effects of either humor, threat or their interaction were found.

Therefore, it seems that humor and threat do not have an effect on producing empowering resistance in an anti-alcohol abuse message.

Negative affect

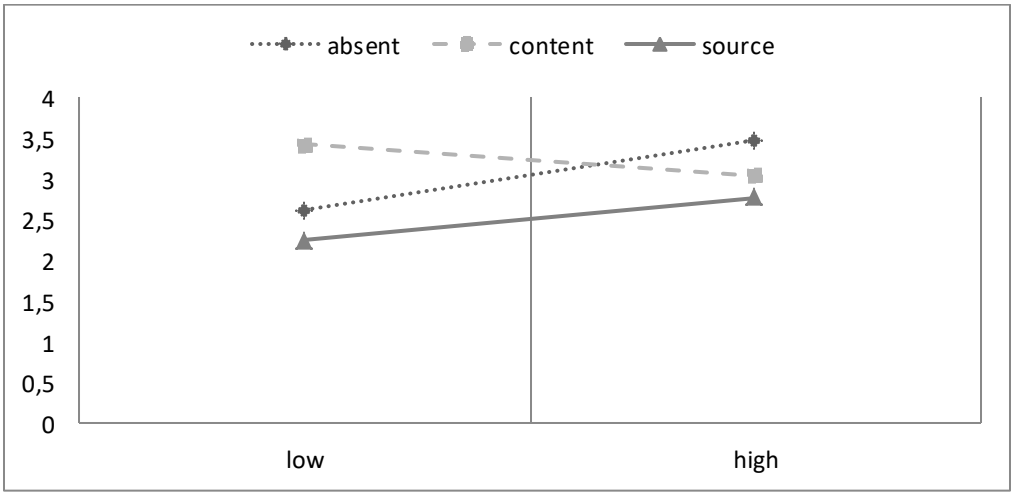
The scores for negative affect were not normally distributed. However, the ANOVA is fairly robust against these violations but the outcomes may not be completely reliable. A factorial ANOVA was performed with the independent variables humor and threat and the dependent variable negative affect. There was a significant main effect of humor $F(2,252) = 8.58$, $p < .001$ $n^2 = .06$. The negative affect scores were not significantly higher for the people who saw the content humor ad ($M = 3.22$, $SD = 1.30$) than for the ones who saw the absent humor ad ($M = 3.00$, $SD = 1.36$) $p = .311$ but were significantly higher for content humor than the source humor ad ($M = 2.53$, $SD = 1.19$) $p < .001$. Furthermore, also a main effect of threat was found $F(1,252) = 4.46$, $p = .036$ $n^2 = .02$ where high threat messages ($M = 3.04$, $SD = 1.28$) produced significantly more negative affect reactions than the low threat messages ($M = 2.73$, $SD = 1.33$). Finally, there was an interaction effect between threat and humor $F(2,252) = 5.37$, $p = .005$ $n^2 = .04$.

This interaction effect was further explored through simple effect analysis of the threat level in combination with each level of the other factor 'humor type'. The first contrast 'absent humor' in combination with threat level shows a significant difference: $F(1,252) = 8.41$, $p = .004$. The second contrast, 'content humor' in combination with threat level did not show a significant difference: $F(1,252) = 2.02$, $p = .156$. The third contrast, 'source humor' in combination with threat level also showed a significant difference: $F(1,252) = 4.44$, $p = .036$. These contrasts show that when there is humorous content in the ad the low threat ads are the ones eliciting significantly higher negative affect resistance. When humor is absent, high threat messages elicit more negative affect.

The interaction effect was also explored through simple effect analysis of the source type in combination with each level of threat. The first contrast low threat in combination with the types of humor did show a significant difference: $F(2,252) = 9.72$, $p < .001$. The second contrast, high threat in combination with the types of humor also showed a significant difference: $F(2,252) = 3.18$, $p = .043$.

As seen in *Figure 5* high threat elicited more negative affect when the ads contained a humorous source or humor was absent. However, when the ads contained humorous content the negative affect elicited was higher when the threat was low. In any case, absent humor produced the lowest negative affect for low and high threat.

Figure 5. *Interaction of humor and threat on negative affect*



5. Discussions

The aim of the present study was to examine the effects of combining threat and humor on the different types of resistance. The main goal was to investigate whether the use of humor could be notably effective to reduce different types of resistance and therefore increase the persuasiveness of health communication messages. Particularly, one of the main goals was testing whether using humorous messages either connected to the content or the source is a helpful technique to reduce resistance for high threatening messages and consequently to investigate whether this is also related to higher persuasion effectiveness. The literature (Hendriks & Janssen, 2018; Mukherjee & Dubé, 2012; Yoon & Tinkham, 2013; Lyttle, 2001) suggested that humor might be an interesting tool to distract the audience of this type of messages from the threat these messages represent.

The effects of humor and threat were tested on general resistance scores as stated in H3, but also specifically on different types of resistance separately as stated in H4 and H5. Surprisingly and contrary to previous studies, ads including humor connected to the content of the message backed up the idea of eliciting higher overall resistance than ads including humor connected to the source and ads without any humor. Indeed, humor connected to the content was helped specifically to elicit higher contesting resistance including higher counter-arguing and higher source derogation, as well as higher negative affect. It seems that the audience in the current research did not consider it appropriate to use humor for such a serious topic as alcohol abuse among the young population and its consequences as shown by some respondents in the thought-listing (e.g., "It is not correct to use comic pictures for these purposes"). However, it is important to point out that any type of humor never elicited resistance scores higher than 4 (out of 7). The means for the different resistance types were never above the scale average so even if content humor generated more resistance than source humor or absent humor, it was a quite light resistance. It should be noted that humor connected to the content was based on ironic formulations of the message, which may have been wrongly interpreted as shown by some respondents in the thought-listing (e.g., "strange, why congratulations? does alcohol makes you irrational. What is this lottery?").

In the case of threat, it only brought out more negative affect resistance in a way in which high threat leads to higher negative affect. In other cases, there was no evidence to support

having an effect by itself in participants' reactions. The effects of threat were more important when interacting with humor. In these cases, high threat produced more resistance than low threat when it was combined with either source or absent humor. However, low threat produced higher resistance than high threat when combined with humorous content. In any case, as the resistance scores for any type of threat were not higher than 4 which is the average scale for resistance, the current study results are not in line with Richards and Banas (2015) who stated that threat elicits high resistance and low effectiveness of the message.

Another interesting finding of humor and threat was their interaction on the overall resistance and specific resistance types as contesting, counter-arguing and negative affect. From all of these interactions, high threatening messages without humor or humorous source elicited higher resistance scores than low threatening ones. However, in the case of messages including humorous content, low threatening messages led to higher resistance scores than high threatening messages. In any case, it cannot be said that content humor reduces resistance since the scores for highly threatening messages were similar for all the types of humor.

A second major goal of the current research, as stated in H2, was to understand how the different types of resistance and persuasion are related. The regression analyses did not support the idea that any resistance strategy could predict attitudinal change. As this is one of the two main ingredients of persuasion it can be concluded that in the current research the types of resistance studied were not totally related to persuasion. The other main aspect of persuasion, behavior intent, was supported to be negatively predicted by avoiding strategies, physical avoidance, counter-arguing and persuasive tactics contesting. In this case, people presenting avoiding strategies, physical avoidance and counter arguing don't intend to behave in a healthy way. Hence, communicating a health persuasive message eliciting these resistance types may produce the opposite effect than expected. The responses of the audience contesting the persuasive tactics showed positive attitude intent. Therefore, it can be said that while communicating health messages, the audience realizing that someone is trying to persuade them might be positive to make them present healthier behavior intent.

In any case, the current study does not give support to the idea of a strong interconnection between different resistance strategies and persuasion. This is an interesting finding since health communication practitioners often worry about eliciting high levels of resistance and therefore

not being able to persuade their audience. The present project showed a light connection between some strategies and a part of persuasion but did not find evidence for a strong and consistent connection. Hence, as a suggestion, health communication specialist should focus on elaborating their messages in a way which may increase mainly persuasiveness.

As this experiment also had an exploratory purpose, the investigators had to code the thoughts of the participants about the health messages to test H1. The thought listing made possible to create a table with all the types of resistance presented by the audience. Surprisingly, negative affect happened to be the most presented resistance strategy among the participants. In any case, it must be said that almost 75% of the audience did not present any type of resistance when confronted with the message. As a consequence, it can be said that the health messages did not generate high resistance in any of the conditions. The results of the though listing in the current study contrast with the ones of Jacks and Cameron (2003), who got resistance responses from every participant. This is mainly due to the fact that Jacks and Cameron asked their participants "What do you do to resist changing your opinion?", which lead to participants to express feelings related to resisting the message, while the current research just invites the participants to express what they felt while reading the ad, without leading them to express resistance. Furthermore, the results in of Jacks and Cameron (2003) are also pretty different since the most elicited resistance type by far was attitude bolstering. The results of the current research are different as they show negative affect as the most common type.

5.1 Limitations and future research

This study has several limitations, which is why a generalization of the present findings should be treated with caution. First of all, in some of the analyses supporting the idea of humor related to the content being able to elicit more resistance, the data was not normally distributed so the factorial ANOVAs may not be totally reliable.

Another factor to be discussed is the types of humor included. As there are tens of types of humor (e.g. ironic formulations, humor related to the topic of the message, play on words, etc.), only ironic content and cartoons as the source of the messages were present in this study. Even if I believe that the types selected were the best ones for the current research, results may differ with a different selection. For example, it may have happened that different types of humor also connected to the source (e.g. human-like images instead of cartoons) had produced different

results. As a consequence, the results and conclusions are only based on these specific types of humor and cannot be generalized to humor as a whole or even content and source humor in general. I believe that this is one of the main reasons why the results in the current research did not support others as Lyttle (2001) presented in the theoretical framework.

The quality of the ads, even if decent, cannot be compared to professional ones. I am of the opinion that this might have biased the respondents when they had to express their thoughts and opinion about the ad. For example, if they feel that the ads are not professional enough the strength of the message can be reduced and therefore the reactions to it biased. The context in which the ad was shown may have also been a reason for a light bias. Also, the static message may have an influence on the effects of threat and humor on overall resistance and the different types of resistance strategies elicited. Other audiovisual composition types may produce different reactions on the audience. For further research, I propose investigating the effects of humor and threat on a video ad or a gift ad, especially for the humorous source condition which included a cartoon, to get more insights on how to communicate health messages to young populations.

The types of resistance taken into account for this study were carefully selected because I thought those were the most useful and convenient for the current experiment. The ACE model was developed in the marketing field but as previously explained I consider it really suits the purpose of the current research. However, there are also some other models, including different resistance types which could have been chosen instead of the ACE or complementing the ACE typologies as for example cognitive reappraisal or reactance. In any case, I would not have expected big differences if a different model and coding scheme would have been used.

Lastly, if the though listing question had been formulated in a different way leading participants to think about how they resist the message, more resistance and different resistance types may have appeared. Compared to the study by Jacks and Cameron (2003) were participants were asked how they resist, the question could have been more pushing for the participant to express resistance reactions instead of any kind of thought or reaction as it is requested by the current formulation. I did not lead participants to think about how they resist because I believe that if respondents are free to answer what they really feel, resistance reactions may be more sincere than if they are pushed to resist.

All in all, even if the current research offers limitations, it is my belief that it provides with interesting insights on why and how humor and threat are related to different resistance types and persuasion. Specifically, the way in which humor and threat interact in eliciting overall resistance, contesting resistance and negative affect.

5.2 Theoretical implications

This research extends the existing literature on humor and threat communicating health messages. Indeed, it focuses on the resistance process and its relationship with persuasion, which is a topic largely overlooked in research until now. Even if the results of this study cannot support previous studies (Mukherjee & Dubé, 2012; Yoon & Tinkham, 2013) pointing to humor as a helpful technique to reduce resistance and therefore increase persuasiveness, this study provides interesting insights on the way in which resistance and persuasion relate, and how and why humor and threat produce different types of resistance.

The project provides some interesting insights on the relationship of some specific types of resistance as avoiding, physical avoidance, counter-arguing and persuasive tactics contesting with behavior intent, which can be considered one of the two main aspects in persuasiveness. It cannot be said that these resistance strategies clearly have an effect on persuasiveness, but it can be seen that they have a slight influence on the persuasion process. Avoiding, physical avoidance, and counter arguing are negatively related to healthy behavior intent while persuasive tactics contesting is beneficial when it comes to eliciting healthy behavior intent.

5.3 Practical implications

The current research also has practical implications. When communicating anti-alcohol abuse messages to young populations, practitioners should include in their messages techniques to mitigate resistance and especially negative affect reactions. One of these techniques might be humor. When humor is connected to the source of the message, it has been supported to have an effect on reducing resistance.

In any case, the use of humor by health communication practitioners should be carefully considered. Based on this research, it cannot be suggested the general use of ironic humor but maybe other types also based on the content (e.g. funny words related to the topic of the message). As shown in the results, different types of humor may have different effects when they

interact with the different levels of threat present in a health communication message. For example, using ironic humor connected to the content of a message is an interesting suggestion for those cases in which the threat of the message is perceived as high. However, its use cannot be suggested under low threat conditions.

As no clear evidence of the mediation of different resistance strategies on persuasiveness depending on the type of humor and threat present on the message was found, trying to mitigate resistance cannot be the most important aspect to focus on when creating a health communication message. Indeed, even some strategies as persuasive tactics contesting are beneficial to elicit better behavior intent. Hence, health communication practitioners should mainly focus on increasing the persuasiveness of their messages.

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Appendix A

Appendix A shows the questionnaire used for the current study:

Start of Block: Consent Block

Q55 Thank you for participating in this study. The survey will take approximately 10 minutes. Your participation in this study is voluntary and your answers will remain anonymous.

In the current study you will be first inquired after some behaviors related to going out. Later, these behaviors will be presented with an advertisement about which you will have to answer a couple of questions.

If you would like to contact the researchers, please use the following email address:

Do you consent to participate? If you consent, you agree to be at least 18 years old.

- ○ Yes, I consent (1)
- ○ No, I do not consent (2)

End of Block: Consent Block

Start of Block: 1st questions

Q1
Please report your opinion about smoking when you go out:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
unfavorable	○	○	○	○	○	○	○	favorable
good	○	○	○	○	○	○	○	bad
negative	○	○	○	○	○	○	○	positive

Q2 Please report your opinion about dancing when you go out:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
unfavorable	○	○	○	○	○	○	○	favorable
good	○	○	○	○	○	○	○	bad
negative	○	○	○	○	○	○	○	positive

Page Break

Q3 Please report your opinion on the following statements about drinking alcohol:

Drinking more than 2 alcoholic drinks on one occasion is sociable:

	1 (1)	2 (2)	(3)	4 (4)	5 (5)	6 (6)	7 (7)	
completely disagree	○	○	○	○	○	○	○	completely agree

Q4
Drinking more than 2 alcoholic drinks on one occasion is irresponsible:

	1 (1)	2 (2)	(3)	4 (4)	5 (5)	6 (6)	7 (7)	
completely disagree	○	○	○	○	○	○	○	completely agree

Q5
Drinking more than 2 alcoholic drinks on one occasion is damaging:

	1 (1)	2 (2)	(3)	4 (4)	5 (5)	6 (6)	7 (7)	
completely disagree	○	○	○	○	○	○	○	completely agree

Q6
Drinking more than 2 alcoholic drinks on one occasion is enjoyable:

	1 (1)	2 (2)	(3)	4 (4)	5 (5)	6 (6)	7 (7)	
completely disagree	○	○	○	○	○	○	○	completely agree

Q7
Drinking more than 2 alcoholic drinks on one occasion is unhealthy:

	1 (1)	2 (2)	(3)	4 (4)	5 (5)	6 (6)	7 (7)	
completely disagree	○	○	○	○	○	○	○	completely agree

Q8
Drinking more than 2 alcoholic drinks on one occasion is fun:

	1 (1)	2 (2)	(3)	4 (4)	5 (5)	6 (6)	7 (7)	
completely disagree	○	○	○		○	○	○	completely agree

End of Block: 1st questions

Start of Block: Condition 1 - Low threat Neutral

Q9
On the next page, you will be presented with a health advertisement. Please read it carefully and answer the accompanying questions

Page Break

Q10

Q11
Please write down the thoughts that you have while looking at this ad. Take a couple of minutes to write them down.

_____

_____

_____

_____

_____

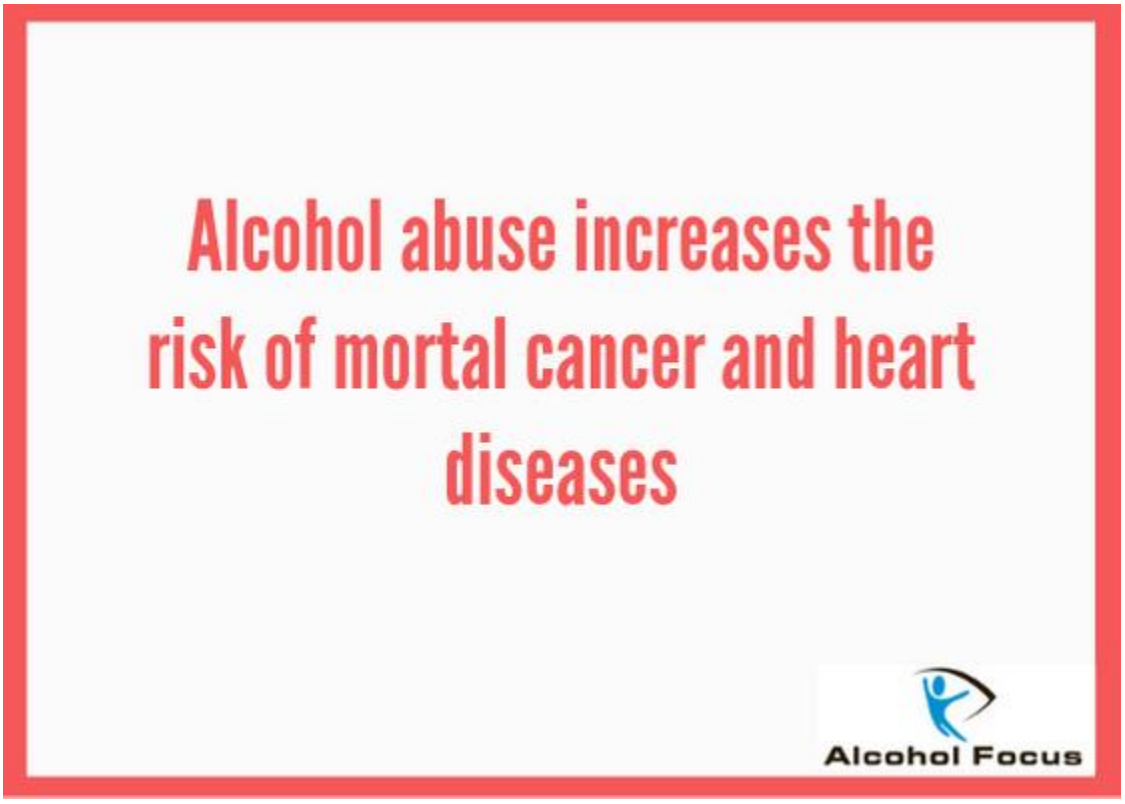
End of Block: Condition 1 - Low threat Neutral

Start of Block: Condition 2 - High threat Neutral

Q12
On the next page, you will be presented with a health advertisement. Please read it carefully and answer the accompanying questions

Page Break

Q13



Q14
Please write down the thoughts that you have while looking at this ad. Take a couple of minutes to write them down.

_____

_____

_____

_____

_____

End of Block: Condition 2 - High threat Neutral

Start of Block: Condition 3 - Low threat Content

Q15
On the next page, you will be presented with a health advertisement. Please read it carefully and answer the accompanying questions

Page Break

Q16

Q17
Please write down the thoughts that you have while looking at this ad. Take a couple of minutes to write them down.

_____

_____

_____

_____

_____

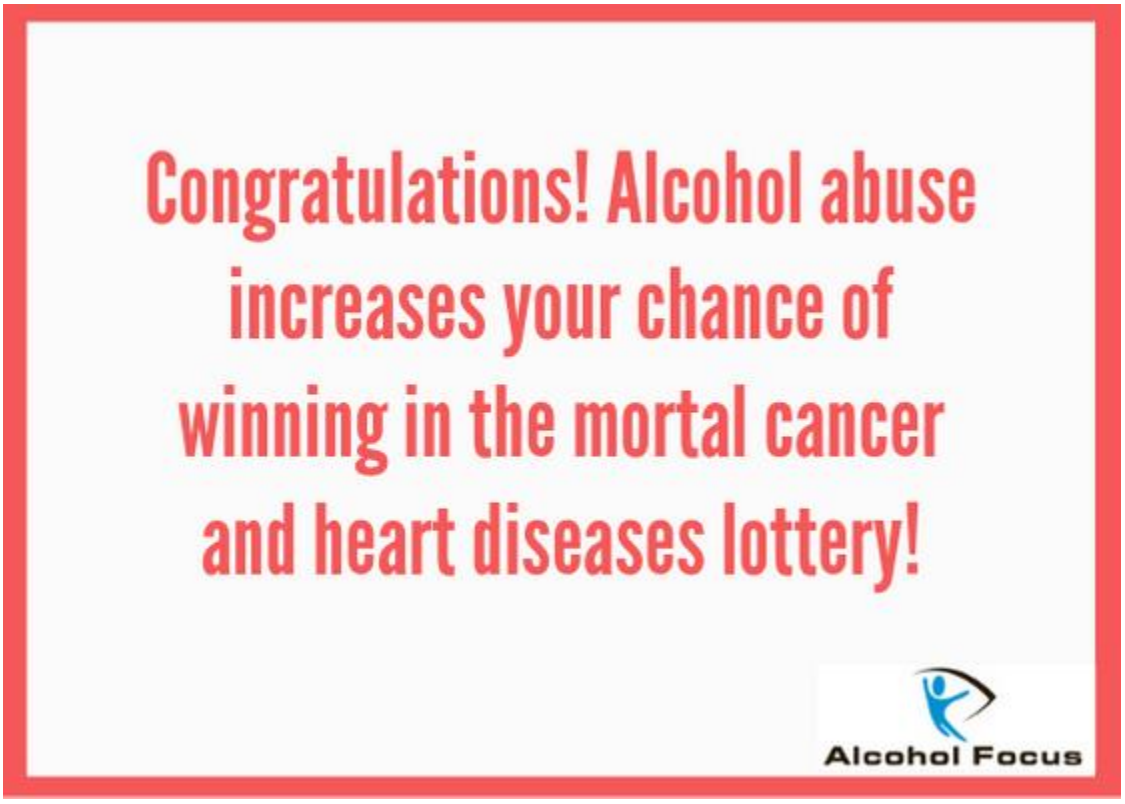
End of Block: Condition 3 - Low threat Content

Start of Block: Condition 4 - High threat Content

Q18
On the next page, you will be presented with a health advertisement. Please read it carefully and answer the accompanying questions

Page Break

Q19



Q20
Please write down the thoughts that you have while looking at this ad. Take a couple of minutes to write them down.

_____

_____

_____

_____

_____

End of Block: Condition 4 - High threat Content

Start of Block: Condition 5 - Low threat Source

Q21
On the next page, you will be presented with a health advertisement. Please read it carefully and answer the accompanying questions

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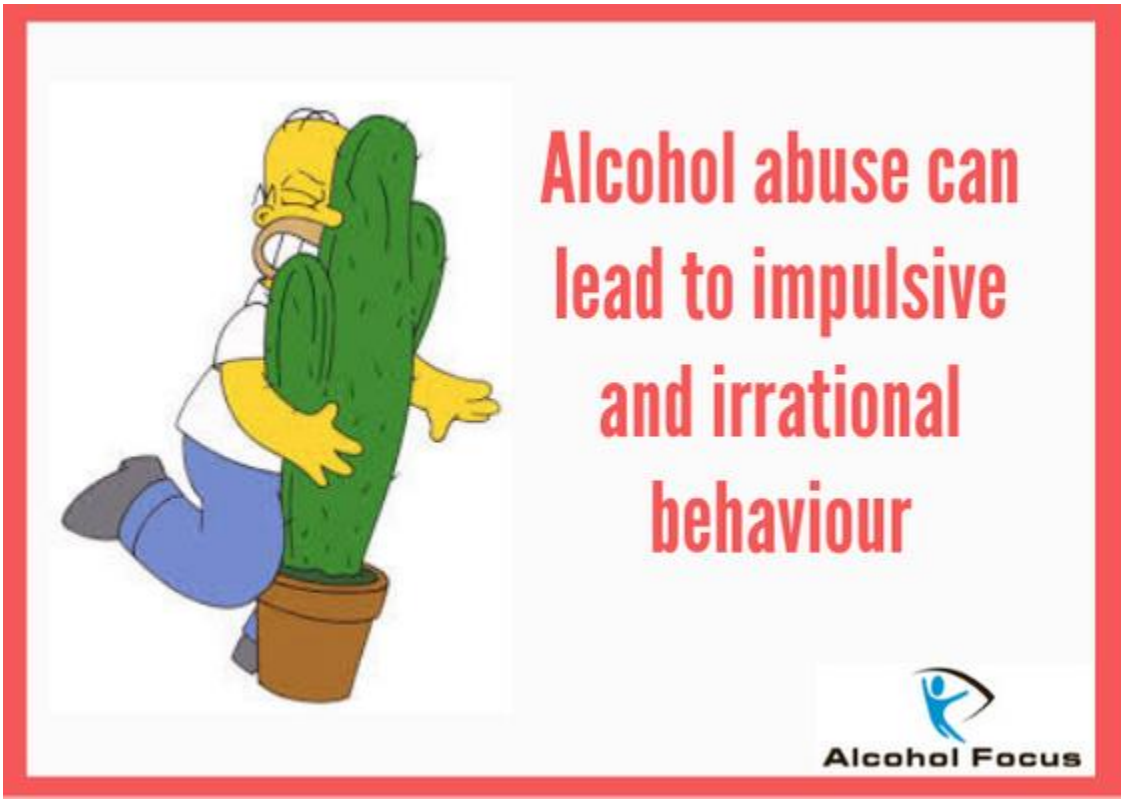
Page Break

Q22



Q23
Please write down the thoughts that you have while looking at this ad. Take a couple of minutes to write them down.

_____

_____

_____

_____

_____

End of Block: Condition 5 - Low threat Source

Start of Block: Condition 6 - High threat Source

Q24
On the next page, you will be presented with a health advertisement. Please read it carefully and answer the accompanying questions

Page Break

Q25

Q26
Please write down the thoughts that you have while looking at this ad. Take a couple of minutes to write them down.

_____

_____

_____

_____

_____

End of Block: Condition 6 - High threat Source

Start of Block: 2nd Questions

Q27
Please answer to the following statements about the advertisement:

While viewing the ad I felt annoyed

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Not at all	○	○	○	○	○	○	○	very much

Q28 While viewing the ad I felt irritated

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Not at all	○	○	○	○	○	○	○	very much

Q29 While viewing the ad I felt bored

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Not at all	○	○	○	○	○	○	○	very much

Q58 While viewing the ad I felt anxious

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Not at all	○	○	○	○	○	○	○	very much

Q59 While viewing the ad I felt uneasy

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Not at all	○	○	○	○	○	○	○	very much

Q60 While viewing the ad I felt uncomfortable

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Not at all	○	○	○	○	○	○	○	very much

Q30
While I was reading the advertisement...

	Totally disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Totally agree (7)
I felt like ignoring the message (2)	○	○	○	○	○	○	○
I tuned out the arguments contradicting my opinion about drinking alcohol (3)	○	○	○	○	○	○	○

Q31 When it comes to providing information on the consequences of alcohol abuse, I think the sender of the message is

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Not credible	○	○	○	○	○	○	○	credible
Not an expert	○	○	○	○	○	○	○	an expert
Not trustworthy	○	○	○	○	○	○	○	trustworthy
Incompetent	○	○	○	○	○	○	○	competent
Not knowledgeable	○	○	○	○	○	○	○	knowledgeable

Q32 When it comes to providing information on the consequences of alcohol abuse, I think the arguments in the message are

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Unreasonable	○	○	○	○	○	○	○	reasonable
Irrational	○	○	○	○	○	○	○	rational
Illogical	○	○	○	○	○	○	○	logical
Not plausible	○	○	○	○	○	○	○	plausible
Unjustified	○	○	○	○	○	○	○	justified

Q33 While I was reading the advertisement...

	Totally disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Totally agree (7)
I thought the sender was using persuasive tactics (5)	○	○	○	○	○	○	○
I thought about arguments or reasons supporting what I believe about alcohol consumption (1)	○	○	○	○	○	○	○
I thought about other people who share my convictions about alcohol consumption (2)	○	○	○	○	○	○	○
I refused to change my mind because I am confident in my opinion about alcohol consumption (3)	○	○	○	○	○	○	○

I thought there is nothing the other people can say that will change my mind about alcohol consumption (4)	○	○	○	○	○	○	○

Page Break

Q34 Please answer to the following questions:

I think the ad is frightening

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
most certainly not	○	○	○	○	○	○	○	most certainly

Q35 The ad scares me

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
most certainly not	○	○	○	○	○	○	○	most certainly

Q36 The ad frightens me

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
most certainly not	○	○	○	○	○	○	○	most certainly

Q37
I think the ad is scary

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
most certainly not	○	○	○	○	○	○	○	most certainly

Q38
I find the ad humorous

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
most certainly not	○	○	○	○	○	○	○	most certainly

Q39
I think the ad is funny

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
most certainly not	○	○	○	○	○	○	○	most certainly

Q40 How much do you drink on an average occasion in which you drink alcohol?

- ○ I don't usually drink alcohol (1)
- ○ 1 glass of alcohol (2)
- ○ 2 glasses of alcohol (3)
- ○ 3 glasses of alcohol (4)
- ○ 4 glasses of alcohol (5)
- ○ 5 glasses of alcohol (6)
- ○ 6 or more glasses of alcohol (7)

Page Break

Q41 Please report your opinion on the following statements about drinking alcohol:

Drinking more than 2 alcoholic drinks on one occasion is sociable:

	1 (1)	2 (2)	(3)	4 (4)	5 (5)	6 (6)	7 (7)	
completely disagree	○	○	○	○	○	○	○	completely agree

Q42 Drinking more than 2 alcoholic drinks on one occasion is irresponsible:

	1 (1)	2 (2)	(3)	4 (4)	5 (5)	6 (6)	7 (7)	
completely disagree	○	○	○	○	○	○	○	completely agree

Q43 Drinking more than 2 alcoholic drinks on one occasion is damaging:

	1 (1)	2 (2)	(3)	4 (4)	5 (5)	6 (6)	7 (7)	
completely disagree	○	○	○	○	○	○	○	completely agree

Q44 Drinking more than 2 alcoholic drinks on one occasion is enjoyable:

	1 (1)	2 (2)	(3)	4 (4)	5 (5)	6 (6)	7 (7)	
completely disagree	○	○	○	○	○	○	○	completely agree

Q45 Drinking more than 2 alcoholic drinks on one occasion is unhealthy:

	1 (1)	2 (2)	(3)	4 (4)	5 (5)	6 (6)	7 (7)	
completely disagree	○	○	○	○	○	○	○	completely agree

Q46 Drinking more than 2 alcoholic drinks on one occasion is fun:

	1 (1)	2 (2)	(3)	4 (4)	5 (5)	6 (6)	7 (7)	
completely disagree	○	○	○	○	○	○	○	completely agree

Q47
The next time that I drink alcohol, I intend to drink responsibly (not more than 2 drinks)

	1 (1)	2 (2)	(3)	4 (4)	5 (5)	6 (6)	7 (7)	
completely disagree	○	○	○	○	○	○	○	completely agree

Q48
The next time that I drink alcohol, I will drink responsibly (not more than 2 drinks)

	1 (1)	2 (2)	(3)	4 (4)	5 (5)	6 (6)	7 (7)	
completely disagree	○	○	○	○	○	○	○	completely agree

End of Block: 2nd Questions

Start of Block: Demographics

Q49 What is your age?

_____

Q50 What is your nationality?

_____

Q51 What is your gender?

- ○ Male (1)
- ○ Female (2)
- ○ Other (3)

Q52 What is your educational level?

- ○ Less than High School degree (1)
- ○ High School degree (2)
- ○ University graduate (3)
- ○ University postgraduate (4)
- ○ Other (5)

End of Block: Demographics

Start of Block: Code

Q60 If you did the survey through SurveyCicle, The Survey Code is: M1H4-6NRL-RXV3-TD1T and finish the survey

For SurveySwap click on https://surveyswap.io/sr/VjEjLDQuLEPlkx61 and finish the survey

If not, please click on continue to finish the survey

End of Block: Code

Appendix B

As the reliability for the avoiding, contesting and empowering scales were not good enough, the same analyses were also conducted on the single types of resistance entailed in these typologies. Physical avoidance, counter-arguing and persuasive tactics contesting were supported to predict attitudinal change.

Prediction of physical avoidance on behavioral intent

On average, participants scored a 4.17 (*SD* = 1.32) on physical avoidance. Given that it was measured on a 7-point scale, this means that people got medium-low scores on this scale. There was one case (0.37%) with standardized residuals larger than 2 and the largest Cook's distance was 0.03, so there are not too many outliers or influential cases. The residuals were independent (Durbin-Watson = 2.10), but the distribution of the residuals showed kurtosis (*z-score kurtosis* = -2.80). Therefore, a bootstrapped regression analysis was conducted to get the confidence interval of the coefficient. The bootstrapped 95% confidence interval ranged from -0.36, -0.09 so I can be 95% confident that physical avoidance predicts behavioral intent in a way that higher avoidance produces unhealthy behavioral intent. Physical avoidance was supported to be a significant predictor of behavior intent (b = -0.22, β = -.207).

Prediction of counter-arguing on behavioral intent

On average, participants scored a 3.00 (*SD* = 1.48) on counter arguing. Given that it was measured on a 7-point scale, this means that people got medium-low scores on this scale. There were two cases (0.74%) with standardized residuals larger than 2 and the largest Cook's distance was 0.07, so there are not too many outliers or influential cases. The residuals were independent (Durbin-Watson = 2.15), but the distribution of the residuals showed kurtosis (*z-score kurtosis* = -2.92). Therefore, a bootstrapped regression analysis was conducted to get the confidence interval of the coefficient. The bootstrapped 95% confidence interval ranged from -0.36, -0.08 so I can be 95% confident that counter arguing predicts behavioral intent in a way that higher counter arguing produces unhealthy behavioral intent. Counter-arguing was supported to be a significant predictor of behavior intent (b = -0.22, β = -.173).

Prediction of persuasive tactics contesting on behavioral intent

On average, participants scored a 3.96 (*SD* = 1.73) on persuasive tactics contesting. Given that it was measured on a 7-point scale, this means that people got medium-low scores on

this scale. There were no cases with standardized residuals larger than 2 and the largest Cook's distance was 0.03, so there are not too many outliers or influential cases. The residuals were independent (Durbin-Watson = 2.15), but the distribution of the residuals showed kurtosis (*z-score kurtosis* = -3.10). Therefore, a bootstrapped regression analysis was conducted to get the confidence interval of the coefficient. The bootstrapped 95% confidence interval ranged from 0.05, 0.30 so I can be 95% confident that persuasive tactics contesting predicts behavioral intent in a way that higher contesting produces healthy behavioral intent. Persuasive tactics contesting was supported to be a significant predictor of behavior intent (b = 0.18, β = .166).

Regression for control variable "current drinking attitude" on attitudinal change

On average, participants scored a 3.61 (*SD* = 1.72) on the current drinking behavior. Given that it was measured on a 7-point scale in which 3 meant "2 glasses of alcohol" which is the cutting point for what it is considered moderate drinking, this means that people got medium-low scores on this scale. There were thirteen cases (4.78%) with standardized residuals larger than 2 and the largest Cook's distance was 0.11, so there are not too many outliers or influential cases. The residuals were independent (Durbin-Watson = 2.01), but the distribution of the residuals showed kurtosis (*z-score kurtosis* = 11.85). Therefore, a bootstrapped regression analysis was conducted to get the confidence interval of the coefficient. The bootstrapped 95% confidence interval ranged from -0.199, -0.08 so I can be 95% confident that current drinking attitude is not related to attitudinal change. Current drinking attitude was not supported to be a significant predictor of attitudinal change (b = 0.14, β = -.31).

Regression for control variable "current drinking attitude" on behavior intent

On average, participants scored a 3.61 (*SD* = 1.72) on the current drinking behavior. Given that it was measured on a 7-point scale in which 3 meant "2 glasses of alcohol" which is the cutting point for what it is considered moderate drinking, this means that people got medium-low scores on this scale. There were eleven cases (4.04%) with standardized residuals larger than 2 and the largest Cook's distance was 0.06, so there are not too many outliers or influential cases. The residuals were independent (Durbin-Watson = 2.14), and the assumption of linearity was met. The regression model was significant ($R2$= .35, $F(1, 270) = 146.96$, $p < .001$), so 35% of the variance in the behavior intent could be explained. Current drinking attitude is a significant

predictor of behavior intent (b = -0.64, β = -.59, $t(270)$ = -12.12, $p < .001$). People who currently drink a lot of alcohol scored low in positive behavior intent.

Appendix C

Factorial ANOVA for threat and humor on Source derogation

The Source derogation scores were normally distributed and the assumption of homogeneity was met. A factorial ANOVA was performed with the independent variables humor and threat and the dependent variable source derogation. There was a significant main effect of humor $F(2,252) = 3.96$, $p = .020$ $n^2 = .03$. The source derogation scores were not significantly higher for the people who saw the source humor ad ($M = 3.71$, $SD = 1.60$) than those who saw the content humor ad ($M = 3.87$, $SD = 1.57$) $p = .333$, but it was significantly higher for people exposed to content humor than for the ones who saw the absent humor ad ($M = 3.25$, $SD = 1.23$) $p = .006$. Furthermore, no main effect of threat was found $F(1,252) = 0.68$, $p = .412$, as well as no interaction effect between threat and humor $F(2,252) = 2.71$, $p = .069$.

Factorial ANOVA for threat and humor on Counter-arguing

The scores for counter-arguing were not normally distributed and the assumption of homogeneity was not met. However, the ANOVA is fairly robust against these violations but the outcomes may not be completely reliable. A factorial ANOVA was performed with the independent variables humor and threat and the dependent variable counter arguing. There was a significant main effect of humor $F(2,252) = 8.63$, $p < .001$ $n^2 = .06$. The counter arguing scores were significantly higher for the people who saw the content humor ad ($M = 3.51$, $SD = 1.75$) than for the ones who saw the absent humor ad ($M = 2.82$, $SD = 1.14$) $p = .003$ and for content humor than the source humor ad ($M = 2.70$, $SD = 1.40$) $p < .001$. Furthermore, no main effect of threat was found $F(1,252) = 0.00$, $p = .980$ but there was an interaction effect between threat and humor $F(2,252) = 3.44$, $p = .034$ $n^2 = .03$. The highest counter arguing resistance was presented when the ad included a low threatening message and content humor ($M = 3.88$, $SD = 1.99$) while the lowest counter arguing resistance was presented for the low threatening messages with source humor ($M = 2.59$, $SD = 1.41$). Once again, the messages with humorous content elicited the highest counter arguing resistance, especially when the consequences stated on them were not severe.

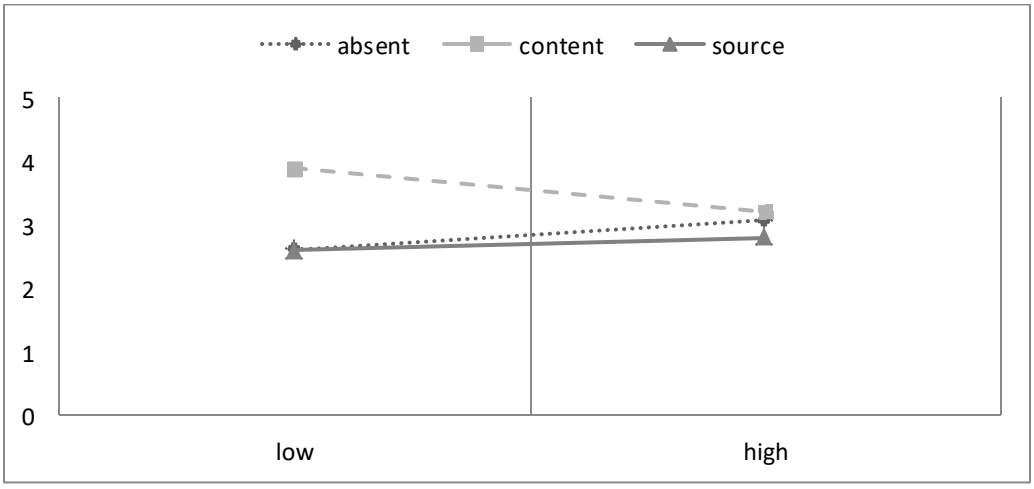
This interaction effect was further explored through simple effect analysis of the threat level in combination with each level of the other factor ‘humor type’. The first contrast ‘absent

humor' in combination with threat level did not show a significant difference: $F(1,252) = 1.79$, $p = .182$. The second contrast, 'content humor' in combination with threat level did show a significant difference: $F(1,252) = 4.60$, $p = .033$. The third contrast, 'source humor' in combination with threat level does not show a significant difference: $F(1,252) = 0.49$, $p = .484$. These contrasts show that when there is humorous content in the ad the low threat ads are the ones eliciting significantly higher resistance.

The interaction effect was also explored through simple effect analysis of the source type in combination with each level of threat. The first contrast low threat in combination with the types of humor did show a significant difference: $F(2,252) = 10.29$, $p < .001$. The second contrast, high threat in combination with the types of humor did not show a significant difference: $F(2,252) = 1.06$, $p = .348$.

As seen in Figure 3 high threat elicited more counter-arguing when the ads contained a humorous source or humor was absent. However, when the ads contained humorous content the resistance elicited was higher when the threat was low. The lowest resistance appeared for low threat and either source or absent humor.

Figure 3. *Interaction of humor and threat on counter-arguing*



Factorial ANOVA for threat and humor on Persuasive tactics contesting

The scores for persuasive tactics contesting were not normally distributed. However, the ANOVA is fairly robust against these violations but the outcomes may not be completely reliable. A factorial ANOVA was performed with the independent variables humor and threat and the

dependent variable counter arguing. There was a significant main effect of humor $F(2,252) = 7.17$, $p = .001$ $n^2 = .05$. The persuasive tactics contesting scores were significantly higher for the people who saw the content humor ad ($M = 4.51$, $SD = 1.84$) than for the ones who saw the source humor ad ($M = 3.87$, $SD = 1.63$) $p = .014$, and also higher for content humor than the absent humor ad ($M = 3.45$, $SD = 1.61$) $p < .001$. Furthermore, no main effect of threat was found $F(1,252) = 2.79$, $p = .096$ as well as no interaction effect between threat and humor $F(2,252) = 0.32$, $p = .727$.

Therefore, it can be said that humor and threat do have an effect on producing contesting resistance but, contrarily to my expectations, the highest contesting resistance is produced by humorous content in an anti-alcohol abuse message.

Appendix D

Here the coding scheme for the thought-listing code can be found:

Physical avoidance: implies losing contact with the message. For instance, in the current research turning off the electronic device in which the message is shown or not looking at the persuasive message – also difficult to measure in the thought-listing

Mechanical avoidance: Cannot be measured here

Cognitive avoidance: related to the way receivers pay attention to the persuasive messages, resulting in "selective exposure" and "selective attention"

Source contesting: discredit the source to show that their position and attitude are the correct ones

Content contesting: also known as counter-arguing and it is used by people who try to give reasons refuting the arguments against their position

Persuasive tactics contesting: consumers are suspicious and perceive the communication tactics as manipulative

Attitude bolstering: defending one's attitudes and beliefs without clearly refuting the persuasive message

Social validation: using significant others validate your current attitude and behavior, since people following this tactic feel supported by relevant persons believing and acting in the same way as they do

Self-assertion: used by people feeling comfortable with their behavior. In this case, receivers usually argue that there is no way in which a persuasive intent can influence their attitude and behavior

Negative affect: Expressing negative emotions including anger, contempt, disgust, guilt, fear, and nervousness