

Master thesis

Social marketing for public health

Listen carefully

An experimental study into the effects of source type, source age, and message valence in social marketing advertisements on young adults' attitudes and behavioral intentions toward wearing hearing protection

Eline Silven

2723301

1st supervisor: Dr. Joyce Karreman

2nd supervisor: Dr. Ardion Beldad

Master program: Communication Science
Digital Marketing Communication & Design

Faculty of Behavioral, Management and Social Sciences (BMS)
University of Twente, Enschede

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Abstract

Purpose: The rising incidence of hearing problems, including hearing loss and tinnitus, has become a significant global public health concern. These hearing disorders are increasingly affecting young adults, largely due to their unsafe listening behaviors, non-use of hearing protection, and increased exposure to loud music as part of their lifestyle habits. These conditions can have detrimental health consequences, including social isolation and cognitive impairments, reducing people's general quality of life. As many young adults do not consider the risk of hearing issues to be of high personal relevance nor an immediate alarming problem, it is crucial to reshape their attitudes and behaviors with regard to hearing health maintenance and hearing protection through social marketing. Given that the social marketing literature on effective persuasion strategies for influencing attitudes and behaviors is scarce, this study seeks to identify and validate various persuasion strategies commonly used in commercial marketing advertising in a social marketing advertising context. Therefore, this study assesses the effects of source type, source age, and message valence in a social marketing advertisement on hearing protection promotion, as these have not been validated in this context before.

Design/methodology/approach: For this study, a 2 (source type: expert endorser vs. experience endorser) \times 2 (source age: younger vs. older) \times 2 (message valence: positive vs. negative) between-subject field experimental design was implemented in the survey program Qualtrics, featuring Western-European participants between 18 and 35 years old. Participants were randomly and equally assigned to one out of the eight experimental advertisement conditions. The survey included questions about the covariate 'attitude toward hearing health', the moderator 'power distance to doctors', the mediator 'attitude toward the advertisement', the three independent variables, and the two dependent variables of this study: attitude toward wearing hearing protection and intention to wear hearing protection.

Findings: This study demonstrated no significant main and interaction effects between the independent variables and the dependent variables. In addition, no mediation effect could be established. However, the effects of the covariate and the moderator showed a significant effect on attitude and behavioral intention regarding wearing hearing protection.

Originality/value: The effects of the independent variables – source type, source age, and message valence – and their interactions on health attitudes and behaviors have not been tested nor substantiated in the existing social marketing literature. Therefore, this study made a step toward closing this literature gap by verifying their impact in a social marketing context.

Conclusion: The findings of this study contribute to the social marketing literature by identifying factors that foster persuasive success in health-related social marketing advertising. By considering the study's insights, social marketers can develop hearing health promotion strategies that better engage with the audience, stimulating positive attitudes and favorable behavioral intentions regarding the use of hearing protection among young adults.

Keywords: Social marketing, Advertising, Persuasive communication, Source type, Source age, Message valence

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1. Introduction

Societies worldwide are facing a growing number of health challenges, emphasizing the importance of social change efforts wherever possible (Grier & Bryant, 2005). Noise-induced hearing loss (NIHL) and tinnitus are among these health challenges that require immediate action (Dritsakis et al., 2020; Hunter, 2018). According to the World Health Organization (2022), these hearing disorders have evolved into major public health issues today, with a rapidly increasing prevalence among young adults (Dritsakis et al., 2020; Schmucker et al., 2019). This sharp rise appears to be linked to two factors: their frequent voluntary exposure to excessive sound levels and their failure to use hearing protection during leisure activities and visits to loud venues like concerts and nightclubs (Crutzen et al., 2020; World Health Organization, 2022). Consequently, 1.1 billion people aged between 12 and 35 are currently at risk of developing permanent, avoidable hearing loss owing to unsafe listening practices, which can have further detrimental health consequences (World Health Organization, 2023). Indeed, hearing loss and tinnitus can foster social isolation, depression, and cognitive impairments, reducing people's general quality of life tremendously (Schmucker et al., 2019; Vogel et al., 2014). Yet, most young adults do not consider the risk of hearing problems to be of high personal relevance, leading to a lack of motivation to take preventative actions such as wearing earplugs (Daniel, 2007; Hunter, 2018). Thus, a shift in their attitude toward hearing health and hearing protection is needed to instigate a change in their listening behaviors and effectively address this critical public health issue (Gilles & Van de Heyning, 2014; Hunter, 2017, 2018).

Social marketing is a common method to influence people's health attitudes and behaviors (Akbar et al., 2022). Social marketing employs the principles and techniques of commercial marketing to encourage a target group to voluntarily adopt, reject, modify, or abandon a behavior for the benefit of individuals, groups, or society (Kotler et al., 2002). For this reason, it places substantial emphasis on public health promotion (Birkinshaw, 1989). The approach was born when Kotler and Zaltman (1971) observed that commercial marketing's principles and strategies for selling products could also be used to 'sell' pro-social ideas, attitudes, and behaviors. Accordingly, social marketing has also embraced various promotional tactics from commercial marketing, including advertising (Evans & McCormack, 2008; Thackeray et al., 2008). Advertising is a preferred promotion technique, as it allows for tailored design and messaging targeted at specific audiences, leading to higher acceptance levels of the promoted attitudes and behaviors (Akbar et al., 2021; Pechmann & Catlin, 2016). As a result, social marketing initiatives that have incorporated advertising have achieved notable successes in reducing obesity, tobacco, and alcohol consumption over the past decades (Pechmann & Catlin, 2016; Wymer, 2010). These favorable outcomes suggest that this approach could foster hearing health attitudes and behaviors too. The World Health Organization (2021) supports this idea, asserting that public health interventions, including the utilization of social marketing to promote safe listening practices, can prevent a substantial number of hearing loss cases.

However, the efficacy of social marketing advertising is currently a topic of academic debate due to its inconsistent success in influencing people's health attitudes and behaviors (Akbar et al., 2022; Shams, 2018). Scholars attribute this lack of persuasive impact to the field's persistent over-reliance on commercial marketing's advertising literature for theoretical grounding, instead of conducting or consulting research specifically dedicated to social marketing advertising (Akbar et al., 2021; Lahtinen et al., 2020; Levit & Cismaru, 2020). In many cases, social marketing advertisements replicate the persuasion strategies used in commercial ones without conducting proper research to verify their effectiveness in social contexts, resulting in ineffective advertisements (Pechmann & Catlin, 2016; Shams, 2018; Wymer, 2011, 2015).

This absence of comparative research and heavy reliance on commercial marketing sources perpetuate the idea that persuasion strategies can be seamlessly applied to social marketing advertisements, neglecting the necessity for evaluative research (Pechmann & Catlin, 2016; Shams, 2018). For this reason, many persuasion strategies remain untested and unassessed for social marketing advertising, causing uncertainty regarding their effectiveness in these contexts. This knowledge gap and lack of research pose significant challenges for social marketers in making well-informed design decisions for their advertisements (Akbar et al., 2022). This leads to advertisements with limited to no persuasive power, producing poor outcomes in terms of attitude and behavior change (Levit & Cismaru, 2020; Shams, 2018). Therefore, it is crucial to conduct further research to identify and validate effective persuasion strategies for social marketing, especially in the public health promotion domain (Akbar et al., 2022; Levit & Cismaru, 2020).

One potential approach to address this gap involves conducting academic tests to assess the effectiveness of persuasion strategies derived from commercial advertisements in social marketing advertisements. Specifically, the literature lacks evaluative research on the persuasive effects of source and message variables in social marketing advertisements (Buda & Zhang, 2000; Ismagilova et al., 2020; Nguyen & Thi Vo, 2021). Therefore, this study examines the application of source type, source age, and message valence manipulations in a social marketing advertisement. The first variable, source type, refers to the specific person who delivers or represents the message in the advertisement (Belch & Belch, 2021). This individual acts as a source of information, leveraging their perceived attractiveness and credibility to influence the acceptability of the message (Batra et al., 1996). The second variable, source age, pertains to the perceived age of the person depicted in the advertisement. The third variable, message valence, denotes the type of positive or negative tone that is applied to a message (Wansink & Pope, 2015). These three persuasion strategies have been selected for this social marketing study, as previous research has shown that their incorporation in commercial advertisements generally has a positive impact on attitudes and behaviors (Buda & Zhang, 2000; Ismagilova et al., 2020; Nguyen & Thi Vo, 2021).

However, these strategies, their combinations, and their potential persuasive effects on health attitudes and behaviors have not been thoroughly tested nor substantiated in the existing social marketing literature (Centola, 2011; Hussein et al., 2014; Levit & Cismaru, 2020). Therefore, this study aims to make a step toward closing this literature gap by conducting an experimental study that examines the potential persuasive effects of source type, source age, and message valence in a hearing protection advertisement. The three persuasion strategies serve as the independent variables, each with two conditions, yielding eight unique combinations of advertisement manipulations. Accordingly, this experiment is based on a $2 \times 2 \times 2$ model. The effects of these independent variables on the two dependent variables are measured: attitude toward wearing hearing protection and intention to wear hearing protection. Scientists in this field confirm that these dependent variables represent two significant behavior change indicators for this public health issue (Gilles & Van de Heyning, 2014; Hunter, 2018; Keppler et al., 2015). Hence, the main research question of this study is:

“To what extent do source type, source age, and message valence in a social marketing advertisement impact young adults’ attitude toward wearing hearing protection and intention to wear hearing protection?”

Since the persuasive impact of these strategies has not been previously examined in this context, the findings of this study contribute to the social marketing literature. Moreover, an advanced understanding of the persuasive impact of these strategies allows social marketers to make deliberate design choices for their advertisements. This enables them to deliver messages that are more likely to promote the desired changes in health attitudes and behaviors, ultimately improving societal wellbeing (Akbar et al., 2022; Wymer, 2010). Consequently, this study is valuable to both science and society.

The main research question is addressed using a systematic approach outlined as follows. The second chapter presents the theoretical framework, which provides a comprehensive overview of the relevant literature and the conceptual lens through which the research question and model is understood and analyzed. The methodology is discussed in the third chapter, which elaborates on the experimental research design of this study. The results of the experiment are presented in the fourth chapter, followed by a discussion in the fifth chapter of this thesis. This final chapter also covers the limitations of the study and the directions for future research.

2. Theoretical Framework

2.1 Unsafe listening behaviors

Hearing loss and tinnitus have become global public health concerns (Dillard et al., 2022). The World Health Organization (2023) estimates that more than 430 million people worldwide suffer from disabling hearing loss and that 1.1 billion young adults are currently at risk of irreversible hearing loss due to unsafe listening practices. Unsafe listening refers to the act of listening to music or other audio content at excessive sound levels (> 85 decibels) or for prolonged durations (Vogel et al., 2010). This exposure can damage the sensory cells in the inner ear, which may result in persistent tinnitus and hearing loss. These disorders can affect various aspects of life, including a person's cognitive, social, emotional, and economic development (Daniel, 2007). Still, noise-induced hearing loss can be prevented by promoting and practicing safe listening habits, such as reducing the volume of personal audio systems, taking regular listening breaks, and wearing earplugs in loud environments (World Health Organization, 2015).

Despite these solutions and potential health risks, young adults still expose themselves to loud music in recreational settings without using any hearing protection (Daniel, 2007; Hunter, 2018). This tendency can be explained by the Health Belief Model by Rosenstock (1960), which posits that an individual's health behavior is shaped by their perception of barriers and benefits associated with preventative actions, as well as their perception of the severity and susceptibility to negative health outcomes. Limited availability, costs, and insufficient knowledge of hearing protection may serve as barriers for young adults in their use of hearing protection devices (Portnuff, 2020). As for benefits, the primary advantage of hearing protection is to prevent hearing disorders. Yet, young adults may not immediately recognize the benefits of using it in loud scenes, as hearing loss typically only occurs after prolonged exposure. Regarding perceived severity and susceptibility, many young adults do not consider the risk of hearing loss to be of high personal relevance nor an immediate alarming problem (Portnuff, 2020).

However, people who have experienced hearing problems view noise-induced hearing loss as a serious issue and feel more prone to permanent hearing disorders (Portnuff, 2020). Therefore, they report a more positive attitude toward hearing protection and exhibit a greater willingness to use it. This aligns with Widén's (2006) theory that self-experience influences an individual's perception of their vulnerability to the consequences of risky health behaviors, serving as a trigger for future protective behaviors (Portnuff, 2020). Hence, public health interventions aimed at modifying young adults' attitudes toward noise-induced hearing loss and hearing protection devices including earplugs are necessary (Hunter, 2018; Gopal et al., 2019). Researchers underscore that messages on the damaging effects of leisure noise and the importance of hearing protection devices may effectuate robust attitudinal and behavioral adjustments among this age group (Gopal et al., 2019; Weichbold & Zorowka, 2007).

2.2 Influencing attitudes and behaviors

Due to the rising incidence of hearing loss and tinnitus among young adults, several health organizations and scientists advocate for the implementation of social marketing to promote hearing conservation (Kaspar et al., 2021; Vogel et al., 2010). Specifically, they recommend employing persuasive advertising campaigns that effectively target and influence the hearing health attitudes and behaviors of this age group. According to Ajzen's Theory of Planned Behavior (1991), an effective strategy for influencing behavior is changing individuals' attitudes. Attitudes are "learned predispositions to respond in a consistently favorable or unfavorable manner with respect to a given object" (Fishbein & Ajzen, 1975, p. 6), ranging from positive, to neutral, to negative (Rucker et al., 2015). While attitudes have a strong predictive power on behavioral responses, Fishbein and Ajzen (1991) acknowledged that attitudes alone do not automatically translate into behaviors. They discovered that behavioral intention mediates the relationship between attitude and behavior. Behavioral intention refers to one's level of motivation to perform a certain behavior (Fishman et al., 2020). However, even with strong behavioral intentions, individuals may not perform the desired behavior. In spite of this, it is essential to first create a positive change in people's attitude toward a specific action to achieve and reinforce the desired behavioral intention (Rucker et al., 2015). That is, a positive attitude toward the action increases the likelihood of people engaging in attitude-relevant behaviors (Fishbein & Ajzen, 1975; Rucker et al., 2015).

Therefore, social marketers ought to focus on modifying attitudes through persuasive advertisements to attain the desired behavioral intention, and ultimately, the behavior (Green et al., 2019; Rucker et al., 2015). The proven effectiveness of persuasion strategies in driving attitude and behavior changes in commercial contexts stresses the importance of exploring their potential to promote pro-social attitudes and behaviors in social marketing settings too (Rucker et al., 2015). To this end, it is useful to investigate the impact of communication variables commonly utilized in commercial advertising, such as those related to the source and message, on social marketing advertisements (Barden & Petty, 2012; Rucker et al., 2015). Nevertheless, comprehensive research on how source and message variables influence attitudes and behaviors in social marketing settings remains scarce (Buda & Zhang, 2000; Ismagilova et al., 2020; Nguyen & Thi Vo, 2021). For this reason, this study manipulates three key variables often employed in commercial marketing but applied within a social marketing context. Specifically, two variables pertain to the source, while one relates to the message in the advertisement. These variables include source type, source age, and message valence, all of which have been shown to exert a significant persuasive impact on commercial advertisements. The next sections discuss the expected persuasive effects of these variables and their potential interactions on the two dependent variables of this social marketing study: attitude toward wearing hearing protection and intention to wear hearing protection.

2.3 Independent variables

2.3.1 Source type: expert endorser vs. experience endorser

The source is defined as the person or entity delivering or representing the advertisement's message (Belch & Belch, 2021). Prior research has indicated that the type of source in an advertisement significantly impacts information credibility, which plays a pivotal role in shaping people's health attitudes and behaviors (Buda & Zhang, 2000). Information credibility pertains to the extent to which individuals perceive information as believable, considering the credibility of the source, the message, and the medium or channel through which the information is presented (Hocevar et al., 2017; Li & Suh, 2015). Borah and Xiao (2018) and Buda and Zhang (2000) have demonstrated that endorser type impacts information credibility by influencing both source credibility and message credibility. Source credibility is defined as the positive characteristics of the endorser that affect the recipient's acceptance of the message (Ohanian, 1990; Sénécal & Nantel, 2004). Message credibility refers to the perceived credibility of the communicated message itself and is influenced by argument strength (Li & Suh, 2015).

With regard to source credibility, Hovland and colleagues (1953) posit that it is composed of two major components: expertise and trustworthiness. They define expertise as "the extent to which a communicator is perceived to be a source of valid assertions" (p. 21) and trustworthiness as "the degree of confidence in the communicator's intent to share the assertions he considers most valid" (p. 21). Expertise strengthens the source's credibility since it enhances their ability to provide accurate information whereas trustworthiness increases the source's credibility because it suggests that the source is motivated to share truthful information (Rucker et al., 2015). Considering the impact of source credibility on information credibility, it is essential to select source that is compatible with the particular context (Willemsen et al., 2011).

In the context of hearing health, an audiologist, a healthcare professional who specializes in auditory processing disorders, is considered an expert source for information and advice on hearing loss prevention (American Academy of Audiology, 2022). Due to their professional knowledge, doctors and health care professionals are generally regarded as the most reliable sources of health-related information and recommendations (Neubaum & Krämer, 2015; Swoboda et al., 2018). However, some scholars state that patients may also be perceived as credible sources given their experiential knowledge of a specific health condition (Neubaum & Krämer, 2015; Rollins et al., 2020). Their advice is based on their subjective experiences with the health issue, treatment, and recovery, rather than on formal qualifications (Wang et al., 2008). Several studies affirm that patients' experiential information can positively impact people's attitudes and self-efficacy toward health behaviors (Hu & Sundar, 2010; Neubaum & Krämer, 2015). Thus, incorporating patients' narrative evidence in an advertisement to support a health risk claim may increase people's perception of their personal health risk and encourage them to adopt protective health behaviors (De Wit et al., 2008).

Still, according to McGuire's (1969) theory of source credibility, professional expertise is valued over non-professional expertise in health contexts, implying that endorsers high in formal expertise are generally more persuasive than those low in formal expertise. This finding is supported by Braunsberger and Munch (1998), who found that the audience's perception of source credibility is consistently higher for the professional expert source than the experience source. Their study also suggests that expertise based on formal health education tends to hold more persuasive value than subjective experience with a health issue. They further contend that an individual's extensive experience in a particular field does not automatically make them an expert on that topic, as expertise requires the acquisition of specialized topic-related skills and knowledge that can be compared to some external standard. Hence, they state that the endorser's perceived expertise is directly associated with and influenced by their possession of professional knowledge in health contexts, which improves their credibility.

Moreover, the possession of professional knowledge also boosts the perceived strength of the arguments presented by the endorser, thereby bolstering message credibility (Arora & Arora, 2004; Li & Suh, 2015; Puckett et al., 1983). The studies by Arora and Arora (2004) and Wood and Kallgren (1988) indicate that the arguments presented by an endorser with professional knowledge were perceived as stronger and attained higher message credibility scores compared to the arguments put forth by an endorser without professional knowledge. Grewal et al. (1994) support this finding by asserting that arguments introduced by an endorser possessing professional knowledge receive less counter-argumentation and questioning, resulting in heightened message and information credibility. Case et al. (2018) and Guillama (2000) validate this claim, indicating that information from qualified sources like doctors is favored over information from subjective sources like patients. Considering that endorsers with professional knowledge, i.e., expert endorsers, and their messages are perceived as more credible, it is expected that they will exert a stronger persuasive influence on attitudes and behaviors compared to endorsers with subjective knowledge, i.e., experience endorsers.

- Hypothesis 1: A social marketing advertisement with an expert endorser results in significantly higher scores on young adults' attitude toward wearing hearing protection and intention to wear hearing protection than an advertisement with an experience endorser.

2.3.2 Source age: younger endorser vs. older endorser

Source age refers to the age or generational cohort of the endorser in the advertisement. When humans are exposed to an advertisement with an endorser, they immediately form both conscious and unconscious judgements about this person based on observable cues like physical characteristics and social roles (Lawrence, 1974; Nelson & Smith, 2012). In this process, people evaluate their level of compatibility with the endorser based on the perceived similarity between themselves and the endorser on relatively easy identifiable attributes such as age (Nelson &

Smith, 2012). Perceived similarity is one out of the three key components of source attractiveness and plays a critical role in increasing message acceptance and persuasion (Bristol, 1996; McGuire, 1985). Hence, when the endorser and audience belong to the same age group or generational cohort, the endorser is often seen as similar to the audience, increasing the endorser's persuasiveness. Commonalities observed in general characteristics like age leads audiences to unconsciously infer more shared attributes with the endorser, such as life situation, interests, and perspective (Nelson & Smith, 2012). As a result, the endorser is viewed as someone relatable and like-minded, referred to as a 'co-oriented peer' (Jones & Gerard, 1967).

The presence of similarity in age between the advertised endorser and the audience has been found to affect people's attitudes across different age ranges, including both older and younger individuals (Bristol, 1996). This impact of endorser similarity on attitudes stems from a process of identification, in which the audience identifies or empathizes with the endorser, resulting in the adoption of a similar position as advocated by the endorser (Kelman, 1961). This phenomenon aligns with Festinger's (1954) theory of social comparison processes, which suggests that individuals evaluate their own opinions by comparing themselves to others who are perceived to possess similar attributes. This comparison process occurs irrespective of whether the similarity is relevant to the message or not (Graham, 1994). The preference for similarity can be attributed to the human desire to minimize the likelihood of significant differences in opinions or attitudes between oneself and the comparison person (Festinger, 1954). Consequently, there is consistent evidence indicating that sources who are perceived as more similar to audience members exert a positive influence on attitudes, behavioral intentions, and actual behavior (Bristol, 1996; Hocevar et al., 2017; Rollins et al., 2020). Additionally, source similarity is thought to impact health-related attitudes and behaviors (Wang et al., 2008).

Given that audiences often evaluate similarity based on observable cues like age, it is reasonable to assume that peer-aged endorsers are seen as more similar to young adults than older endorsers, leading to higher message acceptance and persuasion (Bristol, 1996). However, studies by Lee and Stevens (2022), Puckett et al. (1983), and Eisend (2022) suggest that in the context of health advertising, similarity in age may actually undermine the typically positive association between endorser-audience similarity and persuasion. This effect can be ascribed to the general association of age with experience and wisdom, leading to the presumption that older individuals possess higher levels of expertise and trustworthiness than younger individuals (Bristol, 1996; Fiske et al., 2002; Hutzinger, 2014). Furthermore, the prevailing perception that older individuals have less intent to cause harm works in favor of older endorsers (Fiske et al., 2002). Hence, young adults exhibit greater trust in the intentions of older individuals to share accurate and truthful information compared to younger individuals. This predisposition leads to elevated levels of source credibility and message credibility, and subsequently, information credibility for older endorsers (Bristol, 1996; Fiske et al., 2002).

Regarding source credibility, Lee and Stevens' (2022) study revealed that older endorsers attained higher source credibility scores than younger endorsers of a similar age to the target audience in health-related advertisements. In terms of message credibility, Puckett et al. (1983) discovered that advanced age impacts message credibility through its positive effect on perceived argument strength. That is, the inclusion of an older individual in a message significantly increased young adults' perception of argument strength. Consequently, messages conveyed by older persons received higher message credibility scores than identical messages delivered by young individuals (Puckett et al., 1983). Eisend's (2022) study also shows young adults consider older individuals more suitable, competent, and credible than younger individuals to provide health advice in advertisements. Considering that older endorsers and their messages hold higher credibility, it is predicted that they will exert a stronger persuasive influence on attitudes and behaviors compared to younger endorsers.

- Hypothesis 2: A social marketing advertisement with an older endorser results in significantly higher scores on young adults' attitude toward wearing hearing protection and intention to wear hearing protection than an advertisement with a younger endorser.

2.3.3 Message valence: positive frame vs. negative frame

Message valence refers to the positive or negative framing applied to a message, which affects people's responses to the information (Wansink & Pope, 2015). Research findings suggest that message valence influences message credibility and, consequently, information credibility (Buda & Zhang, 2000). As information credibility significantly shapes attitudes and behaviors, understanding the interplay among message valence, message credibility, and information credibility helps the design of persuasive health messages (Ye et al., 2021). Health messages may be categorized into two broad framing approaches: positive or negative. Health messages using a positive frame emphasize the benefits of engaging in a particular behavior (gain-frame). Conversely, negatively framed health messages highlight the harmful consequences of not engaging in the promoted behavior (loss-frame) (Rosenblatt et al., 2018).

Choosing the appropriate frame for a health message is critical, as studies show that one frame may be more successful in promoting a health behavior change than the other, even when conveying essentially identical information (Gallagher & Updegraff, 2012). This concept, known as the framing effect, originates from Kahneman and Tversky's Prospect Theory (1979). It suggests that when people are presented with choices involving different level of risk, their preference for one option over the other is influenced by how the choices are framed (Gallagher & Updegraff, 2012). As humans are naturally risk averse, people perceive losses to be more significant and something to be avoided, compared to an equivalent gain (Kahneman & Tversky, 1979). Hence, people tend to prefer certain gains over potential gains and potential losses over certain losses.

Rothman and Salovey (1997) used this rationale to study people's responses to health messages presented in the different frames. They discovered that the effectiveness of message framing depends on two factors: the function of the health behavior and its associated risks. Specifically, they found that negative framing is more effective than positive framing when promoting health behaviors perceived as high-risk, such as undergoing a mole check at the doctor's, which carries the risk of detecting melanomas. On the other hand, positive framing is more effective than negative framing when promoting health behaviors perceived as low risk, like exercising, consuming fruits, or wearing sunscreen (Rothman & Salovey, 1997). These activities are typically considered to involve minimal risk, as the only element of risk lies in neglecting or not engaging in these practices (Gallagher & Updegraff, 2012). Therefore, Rothman and Salovey (1997) assert that positive framing is more effective for promoting behaviors that serve a health-maintenance and illness prevention function. Conversely, negative framing is more persuasive when promoting actions that serve an illness detection function, like undergoing mammography screenings (Rothman & Salovey, 1997; Wansink & Pope, 2015). Thus, considering the underlying function of a health behavior helps to determine the appropriate message valence and stimulate a shift in health attitudes and behaviors.

Regarding the effect of message valence on message credibility, people are accustomed to seeing arguments in positive (gain) terms rather than in negative (loss) terms (Buda & Zhang, 2000; Meyerowitz & Chaiken, 1987). Thus, negatively framed arguments challenge the conventional presentation style and appeal to people's risk aversion, leading to greater scrutiny and critical evaluation (Jones et al., 2004; Smith & Petty, 1996). This discrepancy is more likely to generate cognitive dissonance and prompt critical thinking, which often results in increased counter-argumentation and, ultimately, lower message credibility (Arora & Arora, 2004; Borah & Xiao, 2018). Conversely, positively framed arguments align with people's expectations, evoking less questioning and critical assessment than negative arguments. As a result, positively framed messages are more likely to achieve higher message credibility scores than negatively framed messages (Jones et al., 2004; Praxmarer-Carus & Czerwinka, 2013).

In line with Rothman and Salovey's (1997) reasoning, wearing hearing protection reflects a low-risk action for health maintenance and illness prevention purposes. Accordingly, the use of a positive message valence is advised. Furthermore, positively framed messages have a favorable effect on message credibility and, consequently, information credibility (Jones et al., 2004). All things considered, an advertisement employing a positive message valence is expected to have greater persuasive impact than one with a negative message valence in influencing people's attitudes and behavioral intentions regarding wearing hearing protection.

- Hypothesis 3: A social marketing advertisement with a positive message valence results in significantly higher scores on young adults' attitude toward wearing hearing protection and intention to wear hearing protection than an advertisement with a negative message valence.

2.4 Interaction effects

2.4.1 Interaction between source type and source age

The literature indicates that people rely on observable cues, such as endorser type and age, to determine the endorser's credibility, which is considered a key factor for successfully persuading audiences' attitudes and behaviors (Ohanian, 1990; Sénécal & Nantel, 2004). The endorser's credibility is determined by the audience's perception of their perceived expertise and trustworthiness (Hovland et al., 1953). Research shows that possessing professional knowledge, as opposed to experiential knowledge, leads to higher perceived expertise in health contexts, resulting in enhanced credibility of expert endorsers compared to experience endorsers (Braunsberger & Munch, 1998). In addition, studies suggest that having a higher age positively impacts both perceived expertise and trustworthiness, making older endorsers more credible in health contexts than younger endorsers (Bristol, 1996; Fiske et al., 2002).

When higher age is combined with professional knowledge, the endorser's perceived expertise is further enhanced, resulting in even greater credibility. Consequently, the combined effect of higher age and professional knowledge (i.e., being an expert) on endorser credibility surpasses the impact of these factors individually. Thus, this combination of endorser type and age in an advertisement is expected to significantly influence young adults' attitudes and behavioral intentions regarding wearing hearing protection.

- Hypothesis 4: A social marketing advertisement with an endorser who has both professional expertise and a higher age results in significantly higher scores on young adults' attitude toward wearing hearing protection and intention to wear hearing protection compared to any other combination of endorser type and age.

2.4.2 Interaction between source type and message valence

Several studies have investigated the interplay between endorser type and message valence, uncovering their effects on information credibility through the influence they exert on source credibility and message credibility (Buda & Zhang, 2000; Jones et al., 2003; Li & Suh, 2015). Information credibility influences people's decision-making and plays a pivotal role in shaping individuals' health attitudes and behaviors (Buda & Zhang, 2000). Borah and Xiao (2018) and Buda and Zhang (2000) have demonstrated that endorser type affects information credibility by influencing both source credibility and message credibility. As for source credibility, research suggests that possessing professional knowledge, as opposed to experiential knowledge, leads to increased perceived expertise and, consequently, elevated endorser credibility (Braunsberger & Munch, 1998). Likewise, having professional knowledge amplifies the perceived strength of the endorser's arguments, thereby reinforcing message credibility (Arora & Arora, 2004; Wood & Kallgren, 1988). Hence, audiences' source and message credibility perceptions from

endorsers equipped with professional knowledge (expert endorsers) are more favorable than those from endorsers without professional knowledge, such as experience endorsers. Regarding message valence, the framing of a message can influence an individual's message credibility judgements (Buda & Zhang, 2000). Positive message framing aligns with people's general expectation that arguments are delivered in a positive manner, evoking less scrutiny and critical argument assessment compared to negative messages (Jones et al., 2004). Consequently, messages with a positive message valence tend to achieve higher message credibility scores than those with a negative message valence (Arora & Arora, 2004; Borah & Xiao, 2018).

When an expert endorser is combined with a positive message valence, the advertisement's message credibility is further reinforced, yielding an even higher level of information credibility. As a result, the combined influence of an expert endorser and a positive message valence on information credibility exceeds the separate effects of these elements on source, message, and information credibility. Consequently, it is anticipated that the combination of an expert endorser and a positive message valence in an advertisement will strongly influence young adults' attitudes and behavioral intentions regarding wearing hearing protection.

- Hypothesis 5: A social marketing advertisement with an expert endorser and a positive message valence results in significantly higher scores on young adults' attitude toward wearing hearing protection and intention to wear hearing protection compared to any other combination of endorser type and message valence.

2.4.3 Interaction between source age and message valence

Studies indicate that source age and message valence impact information credibility through their influence on source credibility and message credibility. Concerning source age, research shows that a senior age significantly amplifies the endorser's perceived expertise and trustworthiness within health contexts among young audiences, leading to an overall reinforcement of their credibility (Fiske et al., 2002; Hutzinger, 2014). Furthermore, Puckett et al. (1983) found that arguments presented by older individuals are perceived as stronger compared to equivalent arguments put forth by young adults of similar age, resulting in higher levels of message credibility for older endorsers. Hence, young adults hold more favorable perceptions of source and message credibility for older endorsers than younger endorsers.

Regarding message valence, the literature suggests that a positive message valence tends to enhance message credibility more favorably than a negative message valence (Jones et al., 2004). This is due to the alignment of positive message framing with the common anticipation of positive arguments, leading to less skepticism and counter-argumentation when contrasted with negative message framing (Smith & Petty, 1996). Hence, positively framed arguments are more likely to achieve higher message credibility scores than negatively framed arguments.

When an older endorser is combined with a positive message valence, the advertisement's message credibility increases further, resulting in an even higher level of information credibility. As a result, the combined impact of an older endorser and a positive message valence on information credibility surpasses the individual effects of these components on source, message, and information credibility. Therefore, it is expected that the combination of an older endorser and a positive message valence in an advertisement has a strong impact young adults' attitudes and behavioral intentions regarding wearing hearing protection.

- Hypothesis 6: A social marketing advertisement with an older endorser and a positive message valence results in significantly higher scores on young adults' attitude toward wearing hearing protection and intention to wear hearing protection compared to any other combination of endorser age and message valence.

2.4.4 Interaction between source type, source age, and message valence

Besides exploring the individual and interaction effects of source type, source age, and message valence, the interaction effect between these three variables together will be investigated. First, utilizing an expert endorser with professional knowledge is expected to be more effective than an experience endorser with subjective knowledge. Second, the involvement of an older endorser is anticipated to yield greater effectiveness than a younger endorser. Third, the use of a positive message frame is predicted to be more impactful than a negative frame when promoting health maintenance and prevention behaviors. All in all, research indicates that each of these factors impacts information credibility, either by influencing source credibility or message credibility, ultimately contributing to the message's persuasive effectiveness.

The selection of an expert endorser is preferred due to their higher perceived expertise, resulting in increased source credibility. Similarly, an older endorser is positively associated with both perceived expertise and trustworthiness, further bolstering the credibility perception of the endorser. Additionally, a positive message frame triggers less cognitive dissonance and counter-argumentation relative to its negative counterpart, resulting in higher message credibility scores. Therefore, the combination of an older expert endorser and a positive message valence is expected to exert the strongest positive influence on the dependent variables. This combination effectively capitalizes on their positive individual and interaction effects on information credibility through their influence on source and message credibility.

- Hypothesis 7: A social marketing advertisement with an older expert endorser and a positive message valence results in significantly higher scores on young adults' attitude toward wearing hearing protection and intention to wear hearing protection compared to any other combination of source type, source age, and message valence.

2.5 Additional variables

2.5.1 Mediator: attitude toward the advertisement

To accurately assess the impact of the independent variables on the two dependent variables, it is essential to consider ‘attitude toward the advertisement’ as a potential mediator. According to Ajzen’s Theory of Planned Behavior (1991), attitudes toward a given object can predict subsequent behaviors related to that object. Hence, understanding the viewers’ attitude toward the advertisement can assist in predicting their behavioral intention to engage with the hearing health advertisement (Akar & Topcu, 2011). The engagement with the advertisement serves as a precursor to forming positive or negative attitudes and behavioral intentions toward wearing hearing protection (MacKenzie et al., 1986). Thus, by considering the ‘attitude toward the advertisement’ as a potential mediator, more accurate conclusions can be drawn about the effects of the independent variables on the dependent variables.

- Hypothesis 8a, 8b, 8c: The effect of (a) source type, (b) source age, and (c) message valence on young adults’ attitude toward wearing hearing protection and intention to wear hearing protection is mediated by the attitude toward the advertisement.

2.5.2 Moderator: power distance to doctors

An individual’s power distance refers to their perception and acceptance of hierarchical power structures within society or specific social contexts (Daniels & Greguras, 2014). Power distance may influence people’s orientation toward experts and non-experts along the dimension of authority (Dai et al., 2022; Khatri, 2009). That is, people with a higher power distance orientation are more likely to accept the authority of experts, attaching significant importance to their viewpoints and suggestions (Adamovic, 2023). Hence, they hold experts in higher regard and view their contributions as possessing greater credibility and influence compared to those from individuals lacking expertise. Therefore, people with a higher power distance orientation may be more receptive to the guidance and leadership position of experts compared to non-experts (Bright & Cortes, 2019). Alternatively, individuals with a lower power distance orientation may be more inclined to question or challenge the authority and input of experts and seek input from non-experts too (Bright & Cortes, 2019). As a result, individuals with a lower power distance orientation may perceive less power inequality based on expertise, giving equal weight to opinions and recommendations of both experts and non-experts.

- Hypothesis 9: The effect of source type on young adults’ attitude and intention regarding wearing hearing protection is moderated by individuals’ power distance orientation, wherein those with higher power distance are more likely to be influenced by expert endorsers, while those with lower power distance are less susceptible to such influence.

2.5.3 Covariate: attitude toward hearing health

Research by Petty and Cacioppo (1979) indicates that high involvement in a certain (health) issue enhances thinking about the content of a persuasive message that pertains to that specific issue. Hence, an individual's level of involvement in a health issue plays an important role in determining which cognitive processing pathway and subsequent actions they take (Petty & Cacioppo, 1979). In consonance with the Elaboration Likelihood Model by Petty and Cacioppo (1986), individuals who demonstrate high involvement in a health issue are expected to process related information systematically, whereas low-involved individuals tend to not elaborate as much, relying on heuristic processing.

In systematic processing, people carefully and systematically analyze the information presented to them. They critically evaluate arguments and consider evidence before forming an opinion or making a decision. This kind of processing is more effortful and is more likely to induce strong and enduring attitudes (Petty & Cacioppo, 1979). This implies that individuals who are highly involved are less affected by peripheral cues, such as the expert status and the age of an endorser. Conversely, people with low involvement in a health issue are anticipated to engage in heuristic information processing, relying on shortcuts or peripheral cues to form quick judgements. These shortcuts could include factors like the source's attractiveness, expert status, presentation style, or the use of emotional appeals, and typically result in less stable attitudes compared to systematic processing (Petty & Cacioppo, 1979).

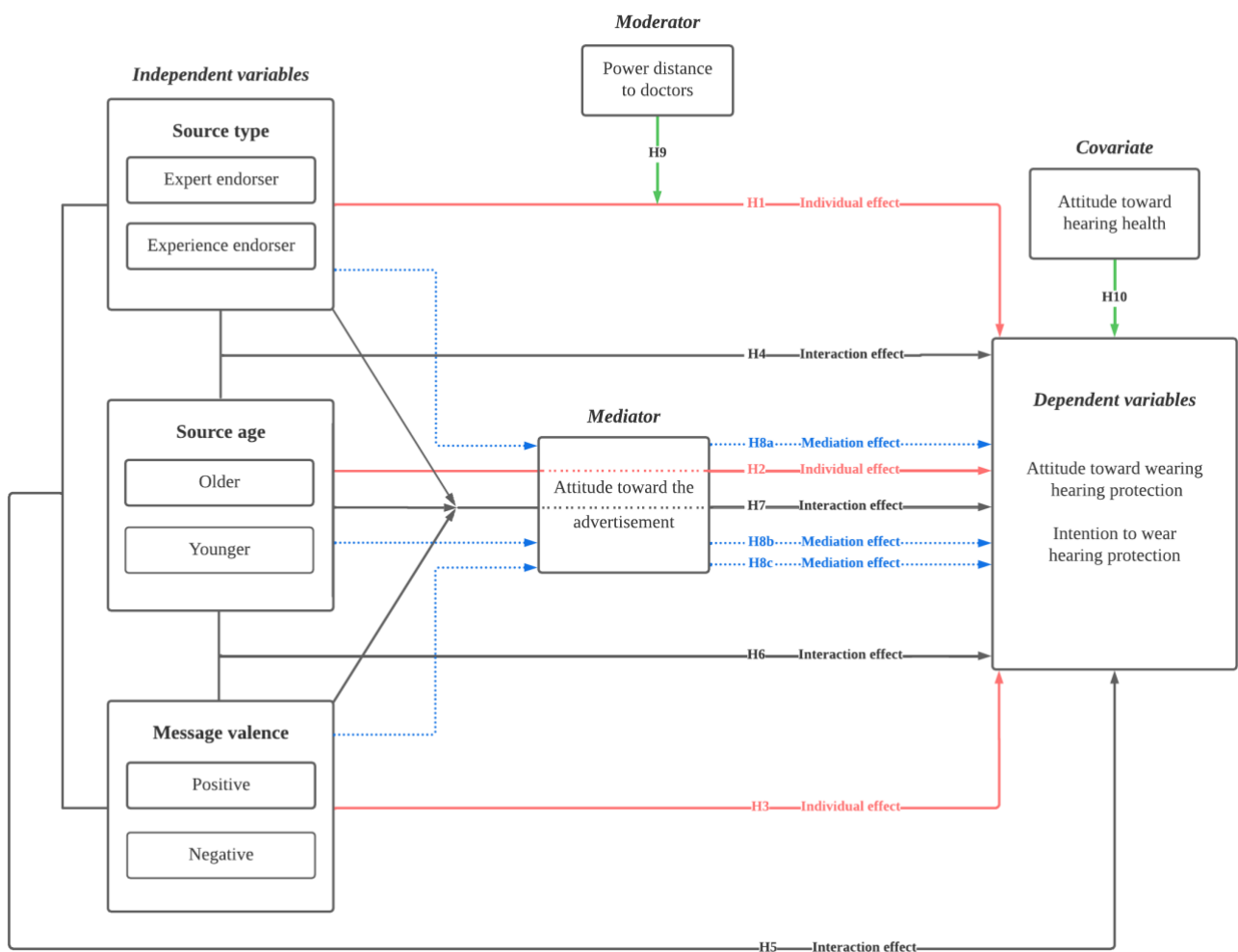
Therefore, it is expected that people's attitude toward hearing health influences their attitude toward wearing hearing protection and intention to wear hearing protection (Portnuff, 2020). This hypothesis is supported by Bogoch et al. (2005), Rawool and Colligon-Wayne (2008), and Widén (2006) who found that individuals with self-experienced symptoms of hearing loss attach greater significance to hearing health and exhibit more favorable attitudes and intentions toward hearing protection, compared to those who have not experienced such symptoms. Thus, as attitude toward hearing health is believed to affect the outcome of the dependent variables, it has been included as a covariate in this study.

- Hypothesis 10: The covariate attitude toward hearing health has a significant effect on young adults' attitude toward wearing hearing protection and intention to wear hearing protection.

2.6 Research model

The research model outlined in Figure 1 portrays the structure of this study. The independent variables – source type, source age, and message valence – are predicted to independently impact the two dependent variables, as denoted by the red arrows. Additionally, the model anticipates interaction effects among the independent variables, which are represented by the black arrows. Moreover, expected mediation effects of attitude toward the advertisement are illustrated by the blue arrows. Finally, this study introduces power distance to doctors as a moderator and attitude toward hearing health as a covariate, both illustrated by the green arrows.

Figure 1. Research model



3. Methodology

3.1 Research design

For this study, a 2 (source type: expert endorser vs. experience endorser) \times 2 (source age: younger vs. older) \times 2 (message valence: positive vs. negative) between-subject field experimental design was implemented to test the hypotheses, resulting in eight conditions (Table 1). This design was selected as it allows for the collection of precise and accurate data and measurements on each manipulation of the independent variables. As a result, well-informed conclusions can be drawn regarding their individual and interaction effects on the dependent variables. In addition, this research design minimizes potential biases and influences that could arise from participants comparing or reacting to different conditions within the study. The effects of the independent variables, mediator, moderator, and covariate on the dependent variables were measured using an online Qualtrics survey.

Table 1. Experimental conditions

Condition	Source type	Source age	Message valence
1	Expert endorser	Older	Positive
2	Expert endorser	Younger	Positive
3	Expert endorser	Older	Negative
4	Expert endorser	Younger	Negative
5	Experience endorser	Older	Positive
6	Experience endorser	Younger	Positive
7	Experience endorser	Older	Negative
8	Experience endorser	Younger	Negative

3.2 Procedure

3.2.1 Pre-test

Before the main experiment was carried out, a pre-test round in the form of interviews was conducted to gather feedback on the clarity of the manipulations in the advertisements, the question sets, and the overall survey. In this way, the quality of the stimuli material and survey could be improved before the official survey version was distributed. This pre-test round involved a convenience sample of eight interviewees between 23 and 29 years old.

The interview was divided in two parts. The first part focused on assessing the clarity of the question sets and the survey as a whole. The participants completed the survey, responding based on their assigned unique experimental condition. Once the survey was completed, the second part of the interview started. This part involved the presentation of all eight possible advertisements based on the eight experimental conditions. The interviewees were asked to identify the corresponding condition applied to each advertisement. They were also encouraged to provide their thoughts and feedback on the stimuli material for improvement purposes.

The complete interview protocol and feedback on both sections can be found in Appendix A and B. Based on feedback from the first part of the interview, redundant and repetitive items were removed. Additionally, some statements were rephrased to improve clarity and readability, particularly in the question sections pertaining to source type and message valence. For example, several interviewees expressed difficulty with questions that included negations. Consequently, the phrasing of these statements was adjusted. Moreover, the attitude toward the advertisement segment featured certain words that were unfamiliar to some Dutch interviewees, including 'delighted' and 'credible'. Hence, these were either replaced with a more familiar alternative or provided with a Dutch translation. This choice was based on the expectation that a substantial portion of participants would be Dutch, given the researcher's Dutch nationality. Furthermore, a progress bar was incorporated in the survey based on a recommendation to provide respondents with a visual representation of their progress throughout the survey.

Regarding the evaluation of the stimuli material in the second part of the interview, the interviewees indicated that the manipulations of source type, age, and message valence were clearly discernable across all the advertisements. However, two significant observations were made concerning the older audiologist and older hearing loss patient. First, the interviewees perceived the older audiologist to exude more authority compared to the younger audiologist, primarily due to his body language. Second, the older hearing loss patient was perceived as noticeably more pitiful than its younger counterpart. Hence, an alternative older hearing loss patient was introduced and evaluated by all interviewees. As this individual was considered to be a more suitable choice, the original version was replaced with this new alternative. Finally, a more neutral substitute was also chosen to replace the older audiologist in the official survey.

3.2.2 Main study

After obtaining the research approval from the Ethics Committee (Appendix E) and digesting all pre-test feedback, the final survey was set up in Qualtrics (Appendix C). This online tool was chosen because of its data collection options and ability to evenly randomize the eight stimuli advertisements among the participants. In addition, it enables direct data export to the statistical software program SPSS, which formed the data analysis tool for this study. The survey was made in English and distributed via anonymized weblinks and a QR code.

Before the experiment started, participants were provided with a brief introduction to the study and a statement of informed consent they needed to agree to in order to proceed with the survey. Once participants agreed, they were asked to provide basic demographic information, including gender, age, and educational level. This demographic information was collected to detect potential correlations among participants' responses during the data analysis phase.

Afterwards, participants responded to questions pertaining to the moderator and covariate variables of this study, involving power distance to doctors and attitude toward hearing health, prior to viewing the stimulus material. Subsequently, participants were asked to indicate whether they had ever experienced any hearing-related problems, such as hearing loss or tinnitus. In the case of an affirmative response, participants were further asked to specify if the hearing problem was temporary or permanent. This information was gathered to gain a better understanding of how these problems might influence perceptions, attitudes, and behavioral intentions among individuals with and without hearing problems.

Recognizing that inquiring about these matters prior to presenting the advertisement might influence participants' subsequent interpretation of it and their responses to questions related to the dependent variables, a set of mildly unrelated questions were also included to subtly redirect their focus. For instance, questions like "I am concerned about public health issues" and "I pay much attention to my health" were incorporated. Nonetheless, it is important to acknowledge the potential priming effect of these moderator and covariate questions. However, if these had been posed after the advertisement or questions regarding the dependent variables, their responses could have been influenced as well. After the moderator and covariate questions, the respondents were randomly and equally assigned to one of the eight stimuli (Appendix D).

While there were eight distinct stimuli, the subsequent questions about the manipulation checks, mediator, and dependent variables were consistent across all surveys to obtain objective data across all experimental conditions. The advertisement remained visible to the respondents at all times. Once all questions were answered, the survey was finished, and the participants were once again thanked for their participation. After completion of the data collection through the Qualtrics survey, the responses and data were exported to the statistical software program SPSS. The data were cleaned before the statistical analyses were carried out. These analyses were used to interpret the collected data, test the hypotheses, establish the statistical significance of the results, and draw conclusions in relation to the main research question.

3.3 Measurements

The survey measured information related to the participants' demographic data, the moderator, covariate, manipulation check questions, mediator, and the dependent variables. A complete overview of all the survey questions and statements can be found in Appendix C.

First, the demographic section included questions to obtain information about the participant's characteristics, including gender, age, and educational level. The subsequent question set about the moderator 'power distance to doctors' was devised by the author due to the absence of relevant scaling literature on this specific topic. Nevertheless, the formulation of these questions drew inspiration from established scales that examine power distance in the context of employer-employee relationships, such as the scale developed by Yoo et al. (2011).

The next questions concerning the covariate 'attitude toward hearing health' were adapted from various studies pertaining to hearing health and protection. This adaptation was necessary as there were no measurement guidelines available for this particular construct. For example, the third statement the covariate section, "I think my hearing health is important" has been derived and modified from a study by the American Speech-Language-Hearing Association (2021). Statement 4: "I am worried about my current hearing health" was modified from the questionnaire by Chung et al. (2005). Statement 5: "I find hearing protection devices such as earplugs helpful" was selected and modified from the research by Dumitrescu et al. (2011).

Statement 7: "It is necessary to use earplugs at loud venues like clubs or concerts" was modified from the Youth Attitude to Noise Scale by Erlandsson and Olsen (2004). Statement 8: "Hearing loss and tinnitus are serious health problems" stemmed from the Attitude Toward Loss of Hearing Questionnaire (ALHQ) by Saunders et al. (2005). Finally, statement 9: "Good hearing improves the quality of my life" was added at the discretion of the author. The subsequent question asking about the participants' history of hearing problems was derived from the Hearing Symptom Description Scale (HSD) developed by Erlandsson and Olsen (2004).

The manipulation check questions relating to the independent variables source type, source age, and message valence were created by the author given the unique experimental conditions of this research. These can be found in Appendix C too. The next question sets measuring the mediator 'attitude toward the advertisement' were derived from the widely recognized 'General Attitude Toward the Advertisement Scale' by De Pelsmacker et al. (2002).

Due to the absence of items measuring the first dependent variable 'attitude toward wearing hearing protection', the question set was formed by integrating both self-developed statements and existing statements related to hearing health. The first statement: "Wearing earplugs is wise" was created by the author. Statements 2 to 6 were derived from the Beliefs About Hearing Protection and Hearing Loss Scale by the US National Institute for Occupational Safety and Health (NIOSH) (1998). The seventh statement: "Earplugs are useful for everyone, not just for those who already have hearing problems" was taken from the survey by Lee and Bahng (2016).

The final question set on the second dependent variable ‘intention to wear hearing protection’ was also developed by the author. This set drew inspiration from the Beliefs About Hearing Protection and Hearing Loss Scale by the US National Institute for Occupational Safety and Health (NIOSH), as well as other scales addressing behavior change. Still, statement 2: “I intend to wear earplugs at loud events to prevent damage” and statement 3: “When earplugs are around when I need them, I will use them” were again based on the Beliefs About Hearing Protection and Hearing Loss Scale (1998). Consistent with the recommendations provided by the studies mentioned, all the question sets in the survey were measured by a 5-point Likert scale, except for the questions pertaining to participants’ history with hearing related problems.

3.4 Materials

The stimuli design was based on the three independent variables: source type, source age, and message valence. As each variable had two conditions, a total of eight fictitious hearing health promotion advertisements were created. Regarding source type, the advertisements featured either an expert endorser, represented by an audiologist, or an experience endorser, portrayed as a hearing loss patient. To clearly convey their roles, the advertisement text explicitly indicated their profession as an audiologist or their personal experience as a hearing loss patient. Additionally, a title was added below the text to further reinforce their respective roles in the advertisements. For instance, in advertisement 1 (Figure 2), the title ‘Dr. Thomas L. Myers, Audiologist’ was prominently displayed, clearly identifying the professional expertise of the endorser. Similarly, in advertisement 8 (Figure 3), the title ‘Thomas L. Myers, Hearing loss patient’ was included, highlighting the personal experience of the endorser. Finally, the audiologist was presented wearing a professional doctor’s uniform and the patient was depicted in casual attire.

As for source age, the advertisements featured either a younger or an older version of the expert or experience endorser. All the advertisements featured a male Caucasian endorser with a neutral body language and facial expression for the source manipulations. This design ensured consistency across the stimuli and controlled for potential confounding variables. Regarding the last variable, message valence, the positively framed advertisement text highlighted the significance of hearing loss prevention and the potential to experience continued enjoyment of delightful sounds throughout one’s lifetime. Conversely, the negatively framed advertisement text stressed the negative repercussions of neglecting safe listening practices and the non-use of earplugs. It also underscored the potential consequences of permanent hearing loss and tinnitus, explicitly addressing their adverse effects on one’s ability to experience the joys of sound and the risk of deafness or ringing sounds. All advertisements were created with PowerPoint and can be found in Appendix D. Two examples are shown on the next page.

Figure 2. Condition 1: Expert endorser – older – positive message valence

“ Listen carefully

“As an audiologist, I know how important it is to protect your hearing health. By practicing safe listening and wearing earplugs, you can prevent permanent hearing loss and tinnitus, and continue to enjoy the wonderful sounds of life, even at loud events.

Do not let hearing loss and tinnitus take the joy of hearing and life from you. As someone who sees the profound impact of hearing loss on patients daily, I encourage you to invest in your hearing health today to cherish the sweet sounds of life for years to come.”

— Dr. Thomas L. Myers, [Audiologist](#)

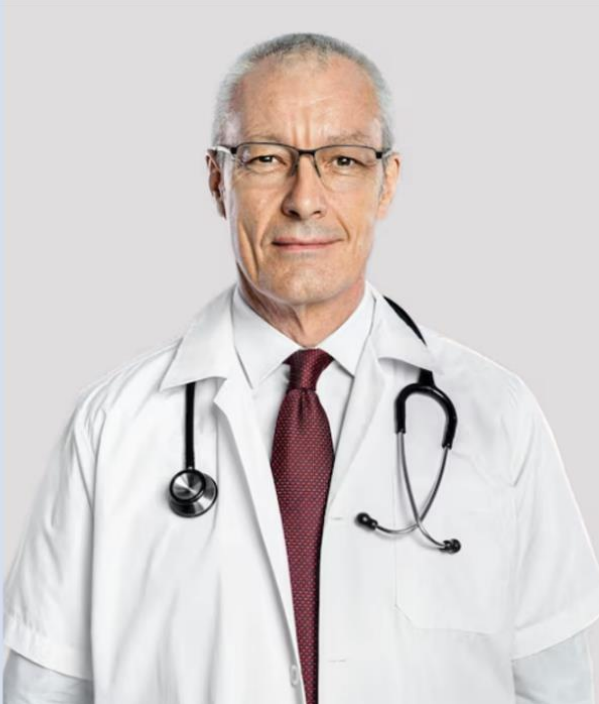



Figure 3. Condition 8: Experience endorser – younger – negative message valence

“ Listen carefully

“As a hearing loss patient, I know firsthand how important it is to protect your hearing health. Failing to practice safe listening and not wearing earplugs can result in permanent hearing loss and tinnitus, which can have a devastating impact on your ability to enjoy the wonderful sounds of life, including music events.

Do not wait for these terrible conditions to happen to you like I did. As someone who experiences the negative consequences of hearing loss daily, I urge you to invest in your hearing health today or you may spend your future filled with ringing or silence.”

— Thomas L. Myers, [Hearing loss patient](#)



3.5 Manipulation check

To assess whether the manipulations to the stimuli were conveyed accurately, an independent t-test was performed. The manipulation check was completed by all respondents in the final Qualtrics survey and encompassed four items measuring source type, four items measuring source age, and two items measuring message valence, using a 5-point Likert scale (1 = strongly disagree ; 5 = strongly agree). A few example items are: “This person has professional knowledge about hearing health”, “I think this person is young”, and “This text mostly uses a positive tone to promote hearing health”. The group statistics and results of the independent sample t-test are presented in Table 2 and 3 and further discussed on the next page.

Table 2. Group statistics manipulation check

Group statistics					
	<i>Manipulation</i>	<i>N</i>	<i>Mean</i>	<i>Std. deviation</i>	<i>Std. error mean</i>
Source type	Audiologist	166	3.70	.69	.054
	Patient	152	2.66	.63	.051
Source age	Older	156	3.50	.33	.026
	Younger	162	2.99	.44	.034
Message valence	Positive	159	2.99	.26	.020
	Negative	159	3.01	.29	.023

Table 3. Independent sample t-test results of manipulation check

Independent sample t-test						
		<i>F</i>	<i>Sig.</i>	<i>t</i>	<i>df</i>	<i>Sig.**</i>
Source type	Equal variances assumed*	1.322	.251	14.001	316	.000
	Equal variances not assumed			14.064	315.934	.000
Source age	Equal variances assumed*	3.771	.053	11.752	316	.000
	Equal variances not assumed			11.815	297.852	.000

Message valence	Equal variances assumed*	.813	.368	-.823	316	.411
	Equal variances not assumed			-.823	312.449	.411

* Levene's test is significant at $p < .05$, equal variances may be assumed above $p > .05$

** Significant difference between the means at $p < .05$

Regarding the source type manipulation, the group statistics in Table 2 indicated a difference between the audiologist ($M = 3.70$, $SD = .69$) and the patient ($M = 2.66$, $SD = .63$) as endorsers. The independent sample t-test in Table 3 confirmed that the difference in mean scores was statistically significant ($t = 14.00$, $df = 316$, $p < .001$). This indicates that the participants were able to distinguish between the expert and experience endorser. As for source age, the mean difference between the older ($M = 3.50$, $SD = .33$) and younger ($M = 2.99$, $SD = .44$) endorser was also significant ($t = 11.75$, $df = 316$, $p < .001$). This result validates that the participants successfully differentiated between the older and younger endorser.

However, the mean difference between the positive ($M = 2.99$, $SD = .26$) and negative ($M = 3.01$, $SD = .29$) message valence was not significant ($t = -.823$, $df = 316$, $p > .05$). This finding suggests that the participants were unable to differentiate between the positive and negative valence. Despite this, this variable was included in the analyses to maintain a comprehensive model that accounts for all variables that were manipulated in the study, providing a more accurate representation of the experimental set up. Furthermore, it is plausible that even though the manipulation did not exhibit statistical significance, respondents might have still been subtly influenced by the valence of the message without consciously recognizing or acknowledging it. Removing this variable from the data analysis could lead to the loss of insights into these potential effects. To sum up, two out of the three manipulations yielded significant results, however, all three independent variables were considered for analysis.

3.6 Participants

Given the global rise in hearing loss and tinnitus, the survey was made accessible to a broad audience. However, the study narrowed its focus to young adults aged between 18 and 35 from Western Europe, including the Netherlands, Belgium, Germany, Luxemburg, France, Austria, Switzerland, and the United Kingdom. This demographic selection was chosen due to their increased susceptibility to hearing damage resulting from lifestyle habits like attending loud music events, frequent use of headphones or earbuds, and exposure to recreational noise (Crutzen et al., 2020; World Health Organization, 2022).

To gather Western European participants, a non-probabilistic convenience sampling strategy was employed. These participants were subsequently prompted to share the survey exclusively with other individuals who also met the age and geographical criteria to boost response rates. Hence, study also relied on snowball sampling. In addition, students at the University of Twente and Saxion University of Applied Sciences were personally approached and invited to partake in the survey. These students underwent an initial screening process to confirm their Western-European background and age, ensuring their alignment with the study's target group criteria. If they met these prerequisites, they were granted access to the survey via a QR code for participation.

Hence, although the survey did not explicitly ask about participants' nationality, the applied sampling and screening strategies ensured that a substantial majority of the respondents were indeed from Western Europe. This claim is supported by the notable proportion of participants (68.2%) who completed the survey using the QR-code, as this method guaranteed compliance to the predefined target group criteria. A comprehensive summary of the participants' demographics is provided in Table 4.

Table 4. Demographics overview of the participants

Demographics overview		n	%
Gender	Male	139	43.7
	Female	179	56.3
	Total	318	100
Educational level	No formal education	0	0
	High school	108	34.0
	Vocational training	34	10.7
	Bachelor's degree from an UAS*	65	20.4
	Bachelor's degree from a university	62	19.5
	Master's degree	44	13.8
	Doctorate / PhD	1	0.3
	Other	4	1.3
Total	318	100	

* *University of Applied Sciences*

To achieve a normal distribution across all eight experimental conditions, a minimum of 30 individuals had to test each manipulation (Chang et al., 2006). Consequently, the study aimed to recruit a total of 240 participants who would respond to the survey questions. This objective was successfully met, as a total of 421 individuals participated in the experiment. However, only data from fully completed surveys and participants who met the age requirement were included for analysis. As a result, a total of 103 surveys were excluded due to incomplete answers ($n = 93$), or non-compliance with the age requirement ($n = 10$), with a few respondents being below 18 ($n = 5$), or above 35 ($n = 5$) years old. This resulted in a final dataset of 318 respondents considered suitable for data analysis. Table 4 further shows that a significant proportion (54%) of the participants achieved some form of higher education, indicating an overall high level of education among the respondents. The categories representing higher education included bachelor's degrees from both universities of applied sciences and traditional universities, as well as master's degrees and doctorates/PhDs.

Table 5 presents the distribution of age and gender among the participants in each condition. The table reveals that the respondents had an average age of 23 ($M = 23.87$, $SD = 3.91$). This result aligns with the age of the researcher and the use of convenience and snowball sampling methods. In terms gender distribution, 43.7% of the respondents were male ($n = 139$), while 56.3% were female ($n = 179$). Furthermore, the average number of participants per condition was 39.75, confirming the fulfillment of the normal distribution requirement.

Table 5. Descriptive statistics on the participant characteristics per condition

Experimental condition				Gender		Age
Source type	Source age	Message valence	<i>N</i>	Male	Female	Mean*
Audiologist	Older	Positive	39	21	18	23.67
		Negative	41	16	25	23.71
	Younger	Positive	42	18	24	24.09
		Negative	44	20	24	23.82
Patient	Older	Positive	40	17	23	24.00
		Negative	36	18	18	23.72
	Younger	Positive	38	13	25	24.26
		Negative	38	16	22	23.66
Total			318	139	179	23.87

* Measured in years

Before exposure to the stimuli, participants answered questions about their power distance to doctors and their attitude toward hearing health. Table 6 provides a concise summary of their group statistics, indicating that the respondents demonstrated a moderate power distance to doctors ($M = 3.21$, $SD = 0.47$) and expressed a generally positive attitude toward hearing health ($M = 3.87$, $SD = 0.48$).

Table 6. Group statistics moderator and covariate

Variables	Mean	Std. deviation
Moderator: Power distance to doctor*	3.21	0.47
Covariate: Attitude toward hearing health*	3.87	0.48

* Measured on a 5-point Likert scale (1 = strongly disagree ; 5 = strongly agree)

Besides, the participants were asked about their history of hearing-related problems, such as hearing loss and tinnitus, and whether these conditions were temporary or permanent. Out of the entire participant pool, 124 individuals (39.0%) indicated to have experienced hearing-related issues (Table 7). Among these 124 respondents, 90 reported their conditions as temporary (72.6%), while 34 stated their conditions as permanent (27.4%). A notable observation was that male participants reported a higher incidence of hearing problems compared to female participants. Among the 139 male participants in the experiment, 65 men (52.4%) had a history of hearing issues, whereas among all 179 female participants, 59 women (47.6%) indicated having experienced hearing problems. A similar pattern was noted in terms of the duration, where 23 male participants (67.6%) reported a permanent condition, as opposed to 11 female participants (32.4%). The Chi-square test indicated that the distribution of participants with hearing problems did not vary significantly among the eight experimental conditions: $\chi^2(7, N = 318) = 4.10, p = .767$.

Table 7. Participant incidence of hearing issues by gender and duration

Participant group	History of hearing issues	Temporary	Permanent
Male participants	65 out of 139 (52.4%)	42 (46.7%)	23 (67.7%)
Female participants	59 out of 179 (47.6%)	48 (53.3%)	11 (32.4%)
Total participants	124 out of 318 (39.0%)	90 (72.6%)	34 (27.4%)

3.7 Validity and reliability of the constructs

To ensure the validity of the measurement instrument and its internal consistency, a factor and reliability analysis were performed on the measured items of the covariate, the mediator, and two dependent variables. The factor analysis aimed to establish construct validity by identifying shared underlying factors that explain the correlations among the observed variables. As such, each of the seven items evaluating the covariate, 14 items assessing the mediator, and 13 items measuring the dependent variables underwent careful scrutiny to determine their suitability for effectively representing the intended constructs. The internal consistency was assessed using the Cronbach's alpha (α) coefficient, where a reliability threshold of $\alpha = .70$ was considered acceptable (Tavakol & Dennick, 2011).

The factor analysis of the covariate 'attitude toward hearing health' identified one item with a factor loading below Kaiser's (1974) acceptability threshold of .50. Consequently, the item "I am worried about my current hearing health" was excluded from further analysis. The factor analysis further yielded two components, leading to the categorization of the items into two distinct constructs: 'perceived hearing health importance' and 'hearing protection device acceptance'. These constructs initially met the Cronbach's alpha threshold of $\alpha = .70$, both precisely registering .70. However, considering that removing the item "Wearing earplugs is comfortable" would raise the alpha score from .70 to .78, resulting in improved internal consistency reliability, the decision was made to exclude this item from the construct 'hearing protection device acceptance'. Table 8 presents a summary of the results obtained from the factor and reliability analysis performed on the covariates.

Table 8. Rotated component matrix of the covariates

Constructs	α	Items	Factor	
			1	2
Perceived hearing health importance*	.70	1. I think my hearing health is important.	.717	
		2. Hearing loss and tinnitus are serious health problems.	.789	
		3. Good hearing improves the quality of my life.	.835	
Hearing protection device acceptance*	.78	1. I find hearing protection devices such as earplugs helpful.		.825
		2. It is necessary to use earplugs at loud venues like clubs or concerts.		.728

* Measured on a 5-point Likert scale (1 = strongly disagree ; 5 = strongly agree)

The factor analysis of the mediator revealed three components, leading to the classification of items into three distinct constructs. However, only constructs one and two were kept, given that the third construct had a Cronbach's alpha of .638 that could not be improved by the removal of any item. Consequently, these items and the associated construct were removed from the analysis. The two retained constructs were labeled as: 'general attitude toward the advertisement' and 'emotional response to the advertisement'. By grouping the items that share common underlying themes, the resulting constructs become more conceptually clear and meaningful. The former displayed a robust Cronbach's alpha reliability value of .81. Regarding the latter construct, the elimination of the item "I think the advertisement is appealing" led to an elevation in Cronbach's alpha, which increased from .67 to .73. Table 9 provides an overview of the outcomes from the factor and reliability analysis conducted on the mediators.

Table 9. Rotated component matrix of the mediators

Constructs	α	Items	Factor	
			1	2
General attitude toward the advertisement*	.81	1. I think the advertisement gives me something to think about.	.535	
		2. I think the advertisement is clear.	.583	
		3. I think the advertisement is interesting.	.593	
		4. I think the advertisement is credible.	.612	
		5. I think the advertisement is convincing.	.681	
		6. I think the advertisement is exaggerated.	.680	
		7. This advertisement makes me feel motivated.	.519	
		8. This advertisement makes me feel annoyed.	.740	
Emotional response to the advertisement*	.73	1. This advertisement makes me feel positive.		.751
		2. This advertisement makes me feel happy.		.846

* Measured on a 5-point Likert scale (1 = strongly disagree ; 5 = strongly agree)

The factor analysis of the dependent variables revealed that two items that belonged to 'attitude toward wearing hearing protection' generated factor loadings below Kaiser's (1974) acceptability threshold of .50. Hence, the items "I think that I can handle loud noise without protection" and "I think that I am more worried about hearing problems if I do not wear earplugs at loud events" were removed from the analysis.

The factor analysis further extracted two distinct components that corresponded to the two dependent variables, with all remaining 11 items successfully loading onto the constructs they were designed to measure. Moreover, the constructs demonstrated strong internal consistency, as indicated by their Cronbach's alpha reliability values of $\alpha = .84$ and $\alpha = .88$. Table 10 summarizes the factor and reliability analysis results for the dependent variables.

Table 10. Rotated component matrix of the dependent variables

Constructs	α	Items	Factor	
			1	2
Attitude toward wearing hearing protection*	.84	1. I think that wearing earplugs is wise.	.734	
		2. I think that earplugs are effective in protecting hearing.	.847	
		3. I think that wearing earplugs at loud events is beneficial.	.687	
		4. I think that the advantages of wearing earplugs are greater than the disadvantages.	.662	
		5. I think that earplugs are useful for everyone, not just for those who already have hearing problems.	.691	
Intention to wear hearing protection*	.88	1. I think I am more willing to wear hearing protection.		.546
		2. I think I intend to wear earplugs at loud events to prevent damage.		.799
		3. I think when earplugs are around when I need them, I will use them.		.662
		4. I think I am committed to wearing earplugs to maintain my hearing health.		.882
		5. I think I am willing to wear earplugs, even if it is a bit uncomfortable.		.801
		6. I think I plan to wear earplugs, even if I am the only one among my friends who does.		.785

* Measured on a 5-point Likert scale (1 = strongly disagree ; 5 = strongly agree)

4. Results

A two-way between-groups multivariate analysis of covariance (MANCOVA) was conducted to examine the effects of the three independent variables, namely source type, source age, and message valence, on the two dependent variables. The analysis took into account the covariates ‘perceived hearing health importance’ and ‘hearing protection device acceptance’ to control for their effects within the research model. The subsequent sections elaborate on the effects of the independent variables and covariates on the dependent variables. Following that, the interaction effects of the independent variables on the dependent variables will be explained, along with the mediation and moderation analyses.

4.1 Main effects

Table 11. Multivariate test results of the independent variables and covariates

Multivariate test results	<i>F-value</i>	<i>df</i>	<i>Wilks’ Lambda</i>	<i>p-value</i>
Source type	1.647	2, 307	.989	.194
Source age	1.389	2, 307	.991	.251
Message valence	.532	2, 307	.997	.588
Perceived hearing health importance	10.795	2, 307	.934	<.001*
Hearing protection device acceptance	53.834	2, 307	.740	<.001*

* Significant at $p < .05$ ($\alpha = .05$)

Table 12. Test of Between-Subjects Effects results of independent variables and covariates

Test of Between-Subjects Effects results		<i>F-value</i>	<i>df</i>	<i>p-value</i>
Source type	Attitude toward wearing hearing protection	2.752	1, 318	.098
	Intention to wear hearing protection	2.245	1, 318	.135

Source age	Attitude toward wearing hearing protection	2.364	1, 318	.125
	Intention to wear hearing protection	1.840	1, 318	.176
Message valence	Attitude toward wearing hearing protection	.069	1, 318	.793
	Intention to wear hearing protection	.980	1, 318	.323
Perceived hearing health importance	Attitude toward wearing hearing protection	21.380	1, 318	<.001*
	Intention to wear hearing protection	8.186	1, 318	.005*
Hearing protection device acceptance	Attitude toward wearing hearing protection	61.666	1, 318	<.001*
	Intention to wear hearing protection	98.050	1, 318	<.001*

* Significant at $p < .05$ ($\alpha = .05$)

Table 13. Descriptive statistics of the independent variables

Independent variable	Condition	Attitude toward wearing HP			Intention to wear hearing protection	
		<i>n</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Source type	Audiologist	166	4.08	.62	3.63	.80
	Patient	152	4.20	.54	3.77	.70
Source age	Older	156	4.17	.59	3.74	.71
	Younger	162	4.10	.58	3.66	.80
Message valence	Positive	159	4.14	.58	3.68	.71
	Negative	159	4.13	.59	3.71	.76

Note: *n* = sample size, *M* = mean, *SD* = standard deviation

4.1.1 Main effect of source type on dependent variables

Table 11 reveals that the first independent variable, source type, did not yield a significant effect on the combination of the dependent variables when controlled for the covariates, as the p-value exceeds .05: $F(2, 307) = 1.647, p = .194, Wilks' \lambda = .989$. Furthermore, Table 12 shows that source type also did not have significant effect on attitude toward wearing hearing protection ($F = 2.752, df = 1, 318, p = .098$) and intention to wear hearing protection ($F = 2.245, df = 1, 318, p = .135$) individually. Given that source type demonstrated statistical insignificance on the dependent variables, hypothesis 1 was not supported.

4.1.2 Main effect of source age on dependent variables

Table 11 shows that the second independent variable, source age, did not exert a significant influence on the combination of the dependent variables when controlled for the covariates: $F(2, 307) = 1.389, p = .251, Wilks' \lambda = .991$. In addition, Table 12 exhibits that source age did not have a significant effect on attitude toward wearing hearing protection ($F = 2.364, df = 1, 318, p = .125$) and intention to wear hearing protection ($F = 1.840, df = 1, 318, p = .176$) individually. For this reason, hypothesis 2 was rejected.

4.1.3 Main effect of message valence on dependent variables

As indicated in Table 11, the third independent variable, message valence, did not have a significant impact on the combination of the dependent variables when taking the covariates into account: $F(2, 307) = .532, p = .588, Wilks' \lambda = .997$. Besides, it did not have a significant effect on attitude toward wearing hearing protection ($F = .069, df = 1, 318, p = .793$) and intention to wear hearing protection ($F = .980, df = 1, 318, p = .323$) individually as outlined in Table 12. As a result, hypothesis 3 was not supported.

4.1.4 Main effect of covariates on dependent variables

Table 11 shows that the covariate 'perceived hearing health importance' had a significant impact on the combination of the dependent variables: $F(2, 307) = 10.795, p < .001, Wilks' \lambda = .934, partial \eta^2 = .066$. In addition, it had a significant effect on attitude toward wearing hearing protection ($F = 21.380, df = 1, 318, p < .001, partial \eta^2 = .065$) and intention to wear hearing protection ($F = 8.186, df = 1, 318, p = .005, partial \eta^2 = .026$) individually (Table 12).

Furthermore, the covariate 'hearing protection device acceptance' exerted a significant influence on the combination of the two dependent variables: $F(2, 307) = 53.834, p < .001, Wilks' \lambda = .740, partial \eta^2 = .260$, as shown in Table 11. It also had a significant effect on attitude toward wearing hearing protection ($F = 61.666, df = 1, 318, p < .001, partial \eta^2 = .167$) and intention to wear hearing protection ($F = 98.050, df = 1, 318, p < .001, partial \eta^2 = .241$) individually, as indicated in Table 12.

Both covariates aligned closely with the concept of this study's initial covariate, 'attitude toward hearing health', and the reviewed literature. Therefore, it was decided to consider the results from the two new covariates as supporting evidence for the initial hypothesis. Hence, hypothesis 10 was not rejected.

4.2 Interaction effects

Table 14. Multivariate tests results of the interactions

Multivariate test results	<i>F-value</i>	<i>df</i>	<i>Wilks' Lambda</i>	<i>p-value</i>
Source type * Source age	.428	2, 307	.997	.652
Source type * Message valence	.304	2, 307	.998	.738
Source age * Message valence	.198	2, 307	.999	.821
Source type * Source age * Message valence	.133	2, 307	.999	.876

Table 15. Test of Between-Subjects Effects results of the interactions

Test of Between-Subjects Effects results		<i>F-value</i>	<i>df</i>	<i>p-value</i>
Source type * Source age	Attitude toward wearing hearing protection	.417	1, 318	.519
	Intention to wear hearing protection	.817	1, 318	.367
Source type * Message valence	Attitude toward wearing hearing protection	.073	1, 318	.787
	Intention to wear hearing protection	.235	1, 318	.628
Source age * Message valence	Attitude toward wearing hearing protection	.190	1, 318	.664
	Intention to wear hearing protection	.378	1, 318	.539

Source type * Source age * Message valence	Attitude toward wearing hearing protection	.002	1, 318	.962
	Intention to wear hearing protection	.215	1, 318	.643

4.2.1 Interaction effect of source type and source age

The interaction between source type and source age did not have a significant effect on the combination of the dependent variables when accounting for the covariates, as the p-value exceeds .05: $F(2, 307) = .428, p = .652, Wilks' \lambda = .997$, as displayed by Table 14. Moreover, Table 15 indicates that this interaction did not demonstrate a significant effect on attitude toward wearing hearing protection ($F = .417, df = 1, 318, p = .519$) and intention to wear hearing protection ($F = .817, df = 1, 318, p = .367$) individually. Thus, hypothesis 4 was rejected.

Table 16. Descriptive statistics of the interaction between source type and source age

Source type	Source age	Attitude toward wearing HP			Intention to wear hearing protection	
		<i>n</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Audiologist	Older	80	4.14	.60	3.72	.73
	Younger	86	4.03	.63	3.55	.86
Patient	Older	76	4.20	.57	3.75	.68
	Younger	76	4.19	.51	3.78	.72

Note: *n* = sample size, *M* = mean, *SD* = standard deviation

4.2.2 Interaction effect of source type and message valence

The interaction between source type and message valence did not yield a significant effect on the combination of the dependent variables in the model that considers the covariates: $F(2, 307) = .304, p = .738, Wilks' \lambda = .998$ (Table 14). Likewise, the interaction did not significantly affect attitude toward wearing hearing protection ($F = .073, df = 1, 318, p = .787$) and intention to wear hearing protection ($F = .235, df = 1, 318, p = .628$) individually, as depicted in Table 15. As a consequence, hypothesis 5 was rejected.

Table 17. Descriptive statistics of the interaction between source type and message valence

Source type	Message valence	Attitude toward wearing HP			Intention to wear hearing protection	
		<i>n</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Audiologist	Positive	81	4.09	.64	3.64	.85
	Negative	85	4.08	.60	3.62	.76
Patient	Positive	78	4.20	.51	3.72	.68
	Negative	74	4.19	.58	3.82	.72

Note: *n* = sample size, *M* = mean, *SD* = standard deviation

4.2.3 Interaction effect of source age and message valence

Table 14 demonstrates that the source age and message valence interaction did not result in a significant effect on the combination of the dependent variables when controlled for the covariates: $F(2, 307) = .198, p = .821, Wilks' \lambda = .999$. Further, the interaction had no significant effect on attitude toward wearing hearing protection ($F = .190, df = 1, 318, p = .664$) and intention to wear hearing protection ($F = .378, df = 1, 318, p = .539$) individually, as shown in Table 15. Therefore, hypothesis 6 was not supported.

Table 18. Descriptive statistics of the interaction between source age and message valence

Source age	Message valence	Attitude toward wearing HP			Intention to wear hearing protection	
		<i>n</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Older	Positive	79	4.19	.60	3.74	.78
	Negative	77	4.15	.58	3.74	.63
Younger	Positive	80	4.10	.57	3.63	.76
	Negative	82	4.11	.60	3.69	.85

Note: *n* = sample size, *M* = mean, *SD* = standard deviation

4.2.4 Interaction effect of source type, source age, and message valence

Table 14 shows that the interaction effect of all independent variables together did not exert a significant effect on the combination of the dependent variables when considering the covariates: $F(2, 307) = .133, p = .876, Wilks' \lambda = .999$.

Additionally, the interaction of source type, source age, and message valence did not have a significant effect on attitude toward wearing hearing protection ($F = .002$, $df = 1, 318$, $p = .962$) and intention to wear hearing protection ($F = .215$, $df = 1, 318$, $p = .643$) individually (Table 15). Accordingly, hypothesis 7 was rejected.

Table 19. Descriptive statistics of the interaction between all independent variables

Source type	Source age	Message valence	Attitude toward wearing HP			Intention to wear hearing protection	
			<i>n</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Audiologist	Older	Positive	39	4.19	.65	3.77	.84
		Negative	41	4.10	.56	3.68	.62
	Younger	Positive	42	4.00	.63	3.52	.85
		Negative	44	4.05	.64	3.57	.87
Patient	Older	Positive	40	4.19	.55	3.70	.72
		Negative	36	4.21	.61	3.81	.64
	Younger	Positive	38	4.21	.47	3.74	.64
		Negative	38	4.18	.55	3.82	.80

Note: *n* = sample size, *M* = mean, *SD* = standard deviation

4.3 Mediation analysis

In the theoretical framework, it was hypothesized that one's attitude toward the advertisement would act as a mediator between the independent and dependent variables. To test the potential mediating effect of the two new associated mediators, Baron and Kenny's (1986) mediation criteria were considered, which require the fulfillment of three specific conditions to establish mediation. First, the variations in the independent variable significantly influence the differences observed in the presumed mediator (path A). Second, the variations in the mediator significantly explain the differences in the dependent variable (path B). Third, considering paths A and B, a previously significant relationship between the independent and dependent variables becomes non-significant. However, the previous analyses found no significant main effects of the independent variables on the dependent variables. Therefore, the third criterion could not be met for any of the independent variables, making it unfeasible to demonstrate mediation effects. Consequently, the conditions for conducting a mediation analysis were not fulfilled in this study, leading to the rejection of hypotheses 8a, 8b, and 8c.

4.4 Moderation analysis

In the theoretical framework, it was proposed that individuals' power distance orientation toward authoritative figures, like doctors, could influence their perception of experts and non-experts. To test this potential moderation effect, a linear regression analysis was conducted to see whether the level of power distance to doctor's could moderate the relationship between the independent variable 'source type' and the dependent variables. The results revealed a significant moderation effect of power distance to doctors on both attitude toward wearing hearing protection ($R^2 \text{ adjusted} = .036, df = 2, 315, p = .003$) and intention to wear hearing protection ($R^2 \text{ adjusted} = .023, df = 2, 315, p = .024$). This outcome suggests that a higher power distance orientation toward doctors is associated with a stronger moderation effect. This implies that as individuals' power distance to doctors increases, their tendency to be influenced by an expert endorser, like an audiologist, in forming attitudes and intentions toward wearing hearing protection also increases. As a result, hypothesis 9 was supported.

4.5 Hypotheses overview

Table 20. Hypothesis overview and results

	Hypotheses	Outcome
1	A social marketing advertisement with an expert endorser results in significantly higher scores on young adults' attitude toward wearing hearing protection and intention to wear hearing protection than an advertisement with an experience endorser.	Not supported
2	A social marketing advertisement with an older endorser results in significantly higher scores on young adults' attitude toward wearing hearing protection and intention to wear hearing protection than an advertisement with a younger endorser.	Not supported
3	A social marketing advertisement with a positive message valence results in significantly higher scores on young adults' attitude toward wearing hearing protection and intention to wear hearing protection than an advertisement with a negative message valence.	Not supported
4	A social marketing advertisement with an endorser who has both professional expertise and a higher age results in significantly higher scores on young adults' attitude toward wearing hearing protection and intention to wear hearing protection compared to any other combination of endorser type and age.	Not supported

5	A social marketing advertisement with an expert endorser and a positive message valence results in significantly higher scores on young adults' attitude toward wearing hearing protection and intention to wear hearing protection compared to any other combination of endorser type and message valence.	Not supported
6	A social marketing advertisement with an older endorser and a positive message valence results in significantly higher scores on young adults' attitude toward wearing hearing protection and intention to wear hearing protection compared to any other combination of endorser age and message valence.	Not supported
7	A social marketing advertisement with an older expert endorser and a positive message valence results in significantly higher scores on young adults' attitude toward wearing hearing protection and intention to wear hearing protection compared to any other combination of source type, source age, and message valence.	Not supported
8	The effect of (a) source type, (b) source age, and (c) message valence on young adults' attitude toward wearing hearing protection and intention to wear hearing protection is mediated by the attitude toward the advertisement.	Not supported
9	The effect of source type on young adults' attitude and intention regarding wearing hearing protection is moderated by individuals' power distance orientation, wherein those with higher power distance are more likely to be influenced by expert endorsers, while those with lower power distance are less susceptible to such influence.	Supported
10	The covariate attitude toward hearing health has a significant effect on young adults' attitude toward wearing hearing protection and intention to wear hearing protection.	Supported

5. Discussion

This study examined the effects of a social marketing advertisement on young adults' attitude toward wearing hearing protection and intention to wear hearing protection. The experiment incorporated three independent variables: source type (expert endorser vs. experience endorser), source age (older vs. younger), and message valence (positive frame vs. negative frame). As each independent variable had two manipulations, the experiment involved eight distinct advertisement stimuli, each representing one experimental condition. In addition, the study considered the potential effects of attitude toward the advertisement (as a mediator), power distance to doctors (as a moderator), and attitude toward hearing health (as a covariate) on the research model. In this chapter, the research findings, implications, and future research directions are discussed, leading to the overall conclusion.

5.1 Discussion of the main effects

Regarding the first independent variable, source type, it was expected that an expert endorser would be more effective than an experience endorser in promoting favorable attitudes and behavioral intentions toward wearing hearing protection. However, the analysis revealed that source type did not yield a statistically significant effect on either the participants' attitude toward wearing hearing protection or their intention to wear hearing protection. This suggests that the choice of endorser, whether expert or experienced, did not significantly affect people's perceptions or intentions concerning hearing protection. This finding contrasts with the outcomes of the studies conducted by Braunsberger and Munch (1998), Case et al. (2018), and Guillama (2000), all of which suggest that expert endorsers exert a greater persuasive influence than experience or non-expert endorsers within a health-related context. Perhaps the presumed positive impact of expertise in conveying health messages does not hold true in the context of promoting hearing health among young adults. Hence, additional research is needed to ascertain the optimal source type for effectively delivering hearing health messages.

The second independent variable, source age, also did not demonstrate a significant effect on the dependent variables. Literature related to source age suggested that health promotion messages are more effectively conveyed by older endorsers than younger endorsers due to their higher perceived expertise and trustworthiness (Bristol, 1996; Fiske et al., 2002; Hutzinger, 2014). Nonetheless, the results of the analysis did not exhibit this significant impact. An explanation for this could be that the hearing health topic might be seen as age-neutral, affecting both younger and older people today. Therefore, the age of the endorser may not have exerted a substantial influence on the participants' responses. Still, this assumption should be verified through additional research. Despite the mean scores hinting at a marginal preference for the older endorser in terms of both attitude and intention toward wearing hearing protection, the lack of statistical significance precludes drawing any definite conclusions regarding this potential advantage.

The third and final independent variable, message valence, also failed to exhibit a substantial impact on the dependent variables. Although the study by Rothman and Salovey (1997) argued that a positive message valence be more effective than a negative message valence when promoting health maintenance behaviors – as was the case in this study – no statistically significant effect was observed in this study. This outcome could be attributed, at least in part, to the unsuccessful manipulation of message valence to the advertisements. Therefore, the expected impact of message valence on participants' attitudes and intentions regarding wearing hearing protection might have been weakened. However, a future successful manipulation of this variable may lead to more substantial insights about its role in promoting hearing health maintenance and hearing protection behaviors.

5.2 Discussion of the interaction effects

The first interaction between source type and source age did not give rise to a significant effect on the dependent variables. Based on the studies by Braunsberger and Munch (1998), Bristol (1996), Fiske et al. (2002), and Hutzinger (2014), it was anticipated that an endorser possessing both professional expertise and an advanced age would exert a significant influence on the dependent variables through their combined positive effect on source credibility, which is considered a key factor for successfully persuading people's attitudes and behaviors (Ohanian, 1990; Sénécal & Nantel, 2004). Nevertheless, this effect was not found in this study. The participants might not have perceived the combined source characteristics (expertise and age) as contributing significantly to the credibility of the endorser in this context. Therefore, the relationship between source type, source age, and their combined effect on attitudes and behavioral intentions might be more complex than initially expected in this research setting.

Furthermore, the common link among the three other expected interaction effects was their cumulative effect on information credibility, achieved through their combined impact on both source and message credibility. However, in contrast to the expectations drawn from the literature, none of these interaction effects displayed statistical significance. These insignificant outcomes imply that the particular manipulations applied to the independent variables in this study might not have been suitable for establishing the expected interaction effects. Moreover, the manipulations of the independent variables in the advertisements could be considered as peripheral cues, which tend to work well for audiences with lower issue involvement (Petty & Cacioppo, 1979). Nonetheless, the participants in this study generally had a positive attitude toward hearing health. This indicates that the study involved an audience with a higher level of involvement, who processes information related to the issue more thoroughly and content-based rather than using mental shortcuts, like low involved individuals. As a result, the manipulations might not have exerted a significant influence on the participants. Thus, it is crucial to consider the target audience's level of involvement with the topic when creating (hearing) health promotion advertisements, as it can greatly influence the content and format, and ultimately the effectiveness of the advertisement.

5.3 Discussion of the covariate, mediator, and moderator

Based on the literature review, the covariate ‘attitude toward hearing health’ and the mediator ‘attitude toward the advertisement’ were included in the research model. After the factor analysis, this covariate was refined into two distinct covariates: ‘perceived hearing health importance’ and ‘hearing protection device acceptance’. This modification was made to enhance both the validity and reliability of the construct. The analysis revealed that both covariates had a significant impact not only on the combination of the dependent variables, but also on each individual dependent variable. Although the initial hypothesis pertaining to the covariate ‘attitude toward hearing health’ did not hold, the results from the new covariates were interpreted as supporting evidence for the original hypothesis. This interpretation was based on the close alignment of the new covariates with the core concept of the study’s initial covariate.

The significant results indicate that individuals’ perceptions of the importance of hearing health and their level of acceptance of hearing protection devices significantly shape their attitudes toward wearing hearing protection and their intentions to use such protection. This observation aligns with prior research conducted by Bogoch et al. (2005), Rawool and Colligon-Wayne (2008), and Widén (2006), all of which affirmed that people who consider hearing health to be important and have experience with hearing-related issues tend to hold more positive attitudes and intentions toward wearing hearing protection. Hence, the findings of this study provide additional support for this assertion and hypothesis 10 was supported.

Regarding the mediator ‘attitude toward the advertisement’, the factor analysis also led to the restructuring of this mediator into two new mediators, namely: ‘general attitude toward the advertisement’ and ‘emotional response to the advertisement’. Nonetheless, the absence of statistically significant results between the independent and dependent variables impeded the execution of the mediation analysis. This lack of significance between the variables was necessary for establishing a mediation effect, as outlined by Baron and Kenny (1986). As a consequence, the associated hypotheses were automatically rejected, and no significant mediating effect could be established for the two new mediators.

However, the presumed moderator ‘power distance to doctors’ did produce a statistically significant moderating effect between source type and the dependent variables. This outcome is consistent with the findings by Bright and Cortes (2019), who suggest that an individual’s power distance orientation strongly influences their perceptions and reactions to assertions made by experts versus non-experts. Specifically, their study suggests that people with a higher power distance orientation are more susceptible to the influence of expert endorsers, whereas those with lower power distance are less prone to such persuasion. The significant outcome of the moderation analysis suggests that a higher power distance orientation toward doctors is associated with a stronger inclination to be influenced by the audiologist compared to a lower power distance orientation. Consequently, hypothesis 9 was supported.

5.4 Theoretical implications

The objective of this study was to examine the effects of different persuasion strategies that are commonly used in commercial advertising in social marketing advertising, specifically focusing on hearing health promotion. The outcomes of this study add to the existing social marketing literature on hearing health promotion for several reasons. First, the results of this study suggest that both expertise and age might not hold the same level of significance for young adults in the context of hearing health promotion. Second, the outcomes provide evidence that an individual's perceived level of hearing health importance and hearing protection device acceptance significantly influence their attitudes and intention regarding wearing hearing protection. This finding underscores the importance of these factors in shaping attitudes and behaviors related to health, thereby providing valuable insights for designing public health and social marketing communication strategies. Third, the significant moderating effect of power distance to doctors on the relationship between source type and the dependent variables emphasizes the importance of the individual's power distance orientation in shaping responses to expert and non-expert endorsers in health promotion contexts. Thus, one's power distance orientation forms an essential psychological element that influences people's attitudinal and behavioral responses to endorsed health related messages. In conclusion, the findings of this study contribute to the theoretical discussion on identifying factors that foster persuasive success in health-related social marketing advertising.

5.5 Practical implications

In practical terms, this study has several implications. First, the insight that expertise and age might not carry the same weight for young adults in the context of hearing health promotion suggests that strategies relying solely on these factors may not yield optimal results. Instead, social marketers in the hearing health promotion area should consider tailored approaches that resonate more effectively with this particular target audience. Second, the finding that individuals' perceived importance of hearing health and acceptance of hearing protection devices significantly impact their attitudes and intentions highlights the need for health promotion campaigns that emphasize and capitalize on these factors. Prioritizing these aspects in social marketing campaigns can evoke a stronger response from the audience, and ultimately drive more favorable attitudes and behaviors regarding wearing hearing protection. Lastly, the significant moderating effect of power distance to doctors implies that understanding the audience's power distance orientation is essential when selecting endorsers for health-related social marketing advertisements. The advertisement should be customized to match the audience's power distance orientation to enhance its persuasive effect. Thus, this study offers practical guidance for designing more effective health-related social marketing advertisements. By considering the mentioned insights, social marketers can develop hearing health promotion strategies that better engage with the audience, fostering positive attitudes and encouraging favorable behavioral intentions regarding the use of hearing protection among young adults.

5.6 Limitations and future research directions

This study has provided valuable insights regarding the effects of different persuasion strategies in health-related social marketing advertising. However, it is important to acknowledge the limitations that may have influenced the study's findings and interpretations. To begin, four distinct persons were used across the eight advertisements rather than just two. Therefore, it was not possible to fully control for third variables in relation to the effect of source type and age. To address this concern, future research in this domain could benefit from a more controlled experimental design involving only two individuals in the stimuli.

Furthermore, while participants directly approached in person were inquired about their Western-European background, the same level of control could not be ensured for offline participants who received the survey through referrals. Although the initial participants were explicitly requested to invite only individuals who fulfilled the geographical and age requirements, subsequent participants may not have adhered to these criteria. Consequently, the fact that the survey did not gather nationality data from the participants reflects a limitation that affects the generalizability of the findings and the ability to understand the results within specific cultural or national settings. Hence, it is recommended that future studies incorporate nationality or cultural background questions in the survey, as this allows for a more accurate examination of how national or cultural differences could influence the effectiveness of health promotion strategies.

In addition, the study's participants already exhibited a favorable attitude toward hearing health before being exposed to the stimuli and related questions. This represents a potential research limitation, as it might indicate a pre-existing bias in the participants' attitudes that could influence the generalizability of the findings. In future research, it would be beneficial to include participants from diverse educational levels and occupations. This approach would yield a more nuanced understanding of the effects of the persuasion strategies in this domain on young adults.

Finally, it was decided to retain the independent variable 'message valence' in the analysis of the research model, despite the insignificant manipulation results. Nevertheless, this decision introduces a research limitation, as the insufficient distinction could weaken the validity of the findings related to this variable. To address this concern, it is advisable for future studies to verify the successful manipulation of message valence through pre-tests. This measure would contribute to the overall precision and reliability of the research model and its associated outcomes.

5.7 Conclusion

This study aimed to explore the efficacy of various persuasion strategies commonly employed in commercial marketing advertising within the realm of social marketing advertising. Specifically, it delved into the extent to which source type, source age, and message valence in a social marketing advertisement influence young adults' attitudes toward wearing hearing protection and their intention to wear hearing protection. Accordingly, the main research question of the study was:

“To what extent do source type, source age, and message valence in a social marketing advertisement impact young adults’ attitude toward wearing hearing protection and intention to wear hearing protection?”

The exploration of this research question has yielded valuable insights into the effects of hearing health promotion strategies targeted at young adults and contribute to the existing body of knowledge in the field of hearing health promotion and social marketing. Three important insights have emerged, each with significant implications.

First, the influence of expertise and age on young adults' attitudes and intentions regarding wearing hearing protecting appears to be less salient than initially anticipated. This finding highlights the need for tailored strategies that effectively resonate with the target audience within a health-related context, rather than relying on the source type and age effects observed in commercial advertising. Second, this study unveiled the considerable influence of an individual's perceived importance of hearing health and acceptance of hearing protection devices on attitudes and intentions regarding the use of hearing protection among young adults. This emphasizes the significance of incorporating these elements into hearing health promotion campaigns, as they prove to be strong determinants of the desired attitudes and behaviors. Third, the discovery of the moderating effect of power distance to doctors on the relationship between source type and the dependent variables underscores the importance of acknowledging individual orientations when designing health-related advertisements involving experts, which can significantly impact the advertisement's effectiveness.

In conclusion, this study advances the understanding of how persuasive strategies from commercial marketing can effectively be applied within the context of social marketing. By examining the interaction between source type, source age, and message valence, while also considering the significant effects of the covariates and moderator, this study provides valuable insights for designing effective hearing health promotion advertisements targeted at young adults. By considering these findings, social marketers can create advertisements that have greater potential to exert a persuasive effect on young adults' attitudes and behavioral intentions regarding wearing hearing protection. This, in turn, may contribute to the mitigation of the growing prevalence of hearing loss and tinnitus among the younger generation in the future.

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Appendices

Appendix A: Pre-test interview protocol

“Hello < name participant >,”

Thank you for agreeing to take part in this pre-test. Your contribution is essential to my master thesis research on hearing health promotion. The objective of my research is to examine the impact of social marketing advertisements on young adults’ attitudes and behavioral intentions toward wearing hearing protection. Specifically, I am interested in exploring the potential transferability of advertising persuasion techniques to (public) health promotion. While commercial advertisements often use persuasion techniques to encourage people to purchase certain products or take specific actions, this study aims to examine whether these persuasion strategies can also be effectively applied to social marketing advertisements that promote health-related behaviors. By investigating this transferability, my research strives to contribute to a better understanding of how to motivate individuals to adopt positive health behaviors.

Before the main study is launched, I would like to improve the quality of the associated survey and stimuli material through this pre-test. This pre-test involves reviewing and answering questions about the survey and stimuli material that relate to hearing health promotion. Your feedback on these materials will help me to make the necessary adjustments to ensure the success of the main study. Thus, your feedback will play a crucial role in improving the research materials for the main study and achieving the research objective.

The pre-test will be conducted by means of an interview. I would like to record the interview so that I can revisit it later to process and implement the feedback on the materials. Please note that all interviews and results will be processed anonymously, and no personal information or participant names will be disclosed. I kindly ask that participants refrain from discussing this research with others, as it could potentially influence future participants for the main study.”

Do I have your permission to record this interview?

.....

[*If yes, start the recording*]

“Thank you. I will start the recording now and open the survey for you. Please take your time to read the introductory text carefully.”

.....

“What are your thoughts and comments on the **introductory text**?”

.....

“Thank you. Now I would like to show you the questions related to **demographic information**. The purpose of collecting and processing demographic data in an anonymized manner is to explore potential correlations among the participants’ responses when analyzing all the data later. Please take your time to answer and review the questions.”

.....

“What are your thoughts and comments on the **demographic section** of this survey?”

- “What do you think of the clarity of the questions asked?”
- “What is your opinion on the completeness of the answer options?”

.....

“Thank you. Next, I will present you with the section covering the questions about your **attitude toward hearing health**. Please take your time to answer and review the questions.”

.....

“What are your thoughts and comments on this section related to **attitude toward hearing health**?”

- “What do you think of the provided definition of tinnitus?”
- “What is your opinion on the statements in the question set?”
- “What are your thoughts on the clarity of the questions asked?”
- “What is your view on the length of the question set?”

.....

“Thank you. We have now arrived at the section where the advertisement is shown. Please take your time to view the advertisement.”

.....

“What are your thoughts and comments on the advertisement that you have just seen?”

.....

“Thank you. Could you describe the person shown in the advertisement for me please?”

[*Check if the participant mentions any source and text characteristics in the answer – if not; explain more about the intended manipulation and ask whether the participant recognizes this in retrospect*]

.....

“Thank you. Please proceed to the questions regarding the **source’s message**. Take your time.”

.....

“Please share your thoughts and comments on the question set about the **source’s message**.”

- “What do you think of the statements in the question set?”
- “What are your thoughts on the clarity of the questions asked?”
- “How would you rate the level of difficulty of these questions?”

.....

“Thank you. Please take your time to complete the questions in the next section about the **appearance of the source**.” [*questions related to source similarity in terms of age*]

.....

“What do you think of the questions related to the **appearance of the source**?”

- “What is your opinion on the statements in the question set?”
- “What is your view on the clarity of the questions asked?”
- “How would you rate the level of difficulty of these questions?”
-

.....

“Thank you. We will now move on to the questions regarding the **tone of the message** in the advertisement. Please take your time to finish the associated questions.”

.....

“What do you think of the provided definition of **message valence**?”

.....

“What are your thoughts on the question set about the **message valence**?”

.....

“Thank you. Please take your time to finish the questions that follow regarding your **attitude toward the advertisement.**”

.....

“What do you think of the question sets you have just completed about your **attitude toward the advertisement**?”

- “What is your view on the statements in the question sets?”
- “What do you think of the clarity of the questions asked?”
- “What is your opinion on the length of these question sets?”

.....

“Thank you. Please take your time to finish the questions that follow regarding your **attitude toward wearing hearing protection.**”

.....

“What do you think of the questions related to **attitude toward wearing hearing protection?**”

- “What is your opinion on the statements in the question set?”
- “What do you think of the clarity of the questions asked?”
- “How would you rate the level of difficulty of these questions?”
- “What is your opinion on the length of this question set?”

.....

“Thank you. Please take your time to finish the next questions about your **intention to wear hearing protection.**”

.....

“What are your thoughts and comments on this question set on the **intention to wear hearing protection?**”

- “What is your opinion on the statements in the question set?”
- “What do you think of the clarity of the questions asked?”
- “How would you rate the level of difficulty of these questions?”
- “What is your opinion on the length of this question set?”

.....

“Thank you. You have reached the end of the survey. Thank you for filling it out and sharing your valuable feedback. Your input will help me to improve the execution and quality of my research. If you have any other additional feedback or questions regarding the survey, please do not hesitate to let me know. I would be more than happy to answer any remaining questions or collect further feedback.

.....

“The final step of this interview involves the presentation of all stimuli advertisements. You have just viewed one out of the eight possible advertisements of this research. To ensure that all the stimuli advertisements are conveyed correctly, I would like to show you all eight advertisements and hear your opinion about the stimuli.”

[*An overview of the stimuli advertisements will be shown in PowerPoint or on paper*]

“I have created eight different advertisements based on the following conditions:

- Source credibility: audiologist endorser versus patient endorser
- Source similarity: young person versus senior person
- Message valence: positive versus negative

We will go over the advertisements one by one now. Please tell me which condition you think have been applied to the advertisement shown.” [*stimuli can be found in Appendix E*]

.....

[*In case the participant has a hard time answering this question, ask questions that prompt the participant to compare the differences or similarities between the advertisements or experimental conditions*]

For example:

- “*Can you see the difference between the expert endorser and experience endorser? Why do you think this is the expert endorser and the other is the experience endorser?*”
- “*You have just seen two different (or similar) endorsers in terms of age, what do you think of the clarity of this difference (or similarity) in appearance?*”

“Please share your thoughts on the stimuli advertisements with me.”

- “What is your overall impression of the advertisements you have seen?”
- “How would you rate the clarity of the manipulations applied to the advertisements?”
- “Were there any advertisements that you found confusing or difficult to understand?”
- “Are there any additional comments or feedback you would like to provide on the advertisements? Your feedback will help me to improve my research materials.”

“We have reached the end of the pre-test and this interview. Thank you again for your participation and time. I highly appreciate your feedback; it will be very useful for my research.”

[*Stop the recording*]

-- END --

Appendix B: Pre-test feedback

PART I: SURVEY FEEDBACK

Feedback on the survey introduction

Participant 1	I think the introductory text is clear. It states that the survey originates from you, and it mentions the research goal. I find the text self-explanatory and easy to understand.
Participant 2	I find the text clear. I cannot think of any questions or remarks on this introductory text.
Participant 3	The introduction is elaborate, clear, and most importantly, not too long. Furthermore, the text is easy to read.
Participant 4	I think the introductory text is fine. The only thing I have to comment on is the last sentence about the terms and conditions. It indicates that the respondent has to accept the terms and conditions, but these are not clearly mentioned. You could consider rephrasing this.
Participant 5	I think the text is okay, it is clear to me what is being expected from me. I cannot think of any questions or comments regarding this introduction.
Participant 6	The text seems good, but you could specify what the terms and conditions refer to, as this is not clearly stated. I would suggest strengthening the link between your text and the terms and conditions.
Participant 7	Although not too much is revealed about what you are specifically trying to measure with this survey, I think the introductory text is sufficiently clear. I find the text self-explanatory.
Participant 8	I think this introductory text is complete and logical. I think that everything that should be mentioned in the text has been included. I have no other comments, suggestions, or questions regarding this text.

Feedback on the questions relating to demographic information

Participant 1	The questions are not difficult to understand. I have no other comments.
Participant 2	The questions were easy and clear. Still, a part of me thinks that the age question could have included a 'Prefer not to say' option, but maybe that is personal taste. However, I do understand that you have to collect this information since your research is bound to an age bracket.
Participant 3	Like the introductory text, this page required not too much effort from me. The answer options were complete. However, I did not understand all the answer options in English, so it might be useful to add the Dutch translation behind the options for Dutch respondents.
Participant 4	The demographic information asked from the respondent is fine. You could even restate again that this information is anonymous and cannot be traced back to an individual. Furthermore, you could rephrase the final question to 'highest completed level of education' to be more specific. In addition, I can imagine that you want to make a distinction between a university of applied sciences and a scientific bachelors or masters.
Participant 5	The questions and answer options are clear. I have no additional questions or comments on this page.
Participant 6	Everything is clear to me; I have no comments or questions on this section.
Participant 7	These questions were good. I think that most answer options are covered, and I like that there is a text box available in case the respondent's desired answer option is not available.
Participant 8	The questions are very generic and clear. There are sufficient answer options in the last question.

Feedback on the questions relating to the moderator and covariate

Participant 1	<p>This question set is a bit more difficult than the previous one. I do understand what is being asked but it requires some thinking before I can answer. I think that the statement: “I am prepared to leave or give up activities where the sound level is too loud.” in the second question set should be more elaborated. Does it refer to a situation in which I am already wearing earplugs? Because that would influence my answer. Other than that statement, I think the statements were clear, and the same applies to the tinnitus definition given. It was explained in uncomplicated language for an uninformed person. The number of questions was also okay, not too little, not too many.</p>
Participant 2	<p>The statement: “I tend not to question the information given by a doctor” requires some thinking of the respondent. I think it is easier to remove the negation in the question, as it might cause some confusion. Otherwise, the questions and tinnitus definition were clear. I like that the tinnitus definition is inclusive in the sense that it acknowledges that multiple types of tinnitus sounds exist. The length of the question sets was also good.</p>
Participant 3	<p>I think the first two question sets on this page were clear, complete, and easy to fill out. The last question about tinnitus does raise the question whether one’s hearing loss or tinnitus has to be confirmed by a doctor to fill in ‘yes’. Maybe you can add a note about this in your survey. The provided definition about tinnitus was also good and easy to understand for a diverse audience.</p>
Participant 4	<p>The statement: “I consider doctors to be a health authority” seems quite similar to the first statement: “I consider doctors as respected sources for health advice”. Moreover, I think that you could make the statements in the first question set on this page a little shorter, as it contains some long questions. The overall clarity is okay for both the first and second set. The tinnitus definition is also fine, but the corresponding question could be made more specific by indicating whether hearing loss or tinnitus should be permanent and/or confirmed by a doctor.</p>

Participant 5	I find statements 1, 5, and 6 in the first question set identical. I think you could shorten this question set by eliminating at least one or two statements. In addition, you could rephrase the fourth statement in the second question set to: “I am concerned about my current hearing health”, it makes the question more precise and different from the third statement. The tinnitus definition is clear, but maybe you can use the same font size as is being used in the question.
Participant 6	All question sets were clear. It was easy to fill out and it did not take too long to complete. The tinnitus definition was fine too.
Participant 7	These question sets were clear and not hard to understand, but I think that the questions in the first set that ask about whether you fully trust a doctor as a health advisor is very dependent on the health condition you are facing. So, you may not get an equivocal answer from your respondents. Regarding the second question set, the third statement resembles the second one. I think you could make this question either more specific or different. The tinnitus definition is good and clear.
Participant 8	The first question set is fine as it is, I find all the statements clear. They fit the health context as indicated in the introductory text well. They are easy to answer since they reflect your opinion, so I do not have to think long about my answer. Nevertheless, the statements in the first set are a bit harder to read in terms of language compared to the second set, but this is not problematic. Finally, I find the tinnitus definition okay, though it does not specify whether tinnitus can be temporary or permanent. This may influence the respondents’ answer.

Feedback on the advertisement (general)

Participant 1	I like that there is a photo next to the text, it reinforces the story told by the man. I tend to believe what he said because he speaks from his own experience, and his story sounds plausible with this appearance and age. So, it does have an impact on me. The text was also easy to understand, clear, and not too long.
Participant 2	I find the advertisement credible but boring. I think I would skip the advertisement if it were to appear on my Instagram timeline for example. Nevertheless, I like the title of the advertisement!
Participant 3	The advertisement tries to get across a clear message, but I would not have a closer look at it if it were to appear somewhere. Although the text mentions some positive things, I still consider the text as negative because it still reflects a warning.
Participant 4	I think the advertisement is fine, the message is clearly conveyed. I do not have a particular positive or negative opinion about it.
Participant 5	The advertisement is clear and convincing because it features a medical professional, an audiologist. His age suggests that he has plenty of experience in the field and he mentions that he sees patients with hearing loss every day, so it is his professional occupation.
Participant 6	I find the advertisement okay. The picture and the text are clear, however, I would suggest rephrasing 'negative consequences' to 'negative impact' and 'daily' to 'daily basis'. I think that would improve the text.
Participant 7	The advertisement is fine. Although the text in the advertisement text is short, I think it provides the necessary information to complete the associated questions. The picture used is also fine.
Participant 8	I find this a clear advertisement, but it is not particularly special.

Feedback on the endorser characteristics in the assigned advertisement

Participant 1	I see a young person with a business-like jumper on. The combination of the young person and the text in the advertisement seems credible to me.
Participant 2	He looks like an ordinary guy that I could meet in a bar. He looks convincing in the sense that his gaze conveys that I should wear my earplugs more often. He matches the context of the advertisement.
Participant 3	I see an older man; he seems to be suffering from hearing loss himself. My general impression of the advertisement is quite formal. I think I would only see this type of advertisement in a brochure about hearing loss. As I associate hearing loss with older people, I think it could even be targeted at an older audience. I do not see any points for improvement regarding the design of the advertisement.
Participant 4	I see a doctor who seems to have authority, given his appearance and job title. The advertisement looks credible.
Participant 5	I see an audiologist who clearly states that he has a lot of experience with patients who suffer from hearing loss and therefore urges people to take care of their hearing health.
Participant 6	The person in the advertisement looks like a young doctor. Besides this, he does not show any other special features or characteristics.
Participant 7	I see someone who promotes hearing protection in a positive manner, as he primarily talks about the advantages of hearing protection. He looks like an ordinary trustworthy person. I consider him young, and I could imagine that he is a student who is familiar with the sound levels in clubs.
Participant 8	This is a doctor who seems to have much experience with patients who suffer from hearing loss. He states that hearing loss is preventable and therefore advocates for protection behaviors. He seems do to this in a positive manner.

Feedback on the manipulation check questions relating to source type

Participant 1	<p>The person [young patient] speaks from his own experience, right? Why does the statement: “This person is not necessarily speaking from his personal experiences of dealing with hearing loss” question this? Now I am starting to question my judgment. I would consider a patient an ‘experience expert’ but he is not professional, so I am not sure how I should answer. Still, I tend to consider him an expert because he deals with hearing loss daily. Therefore, I decided to give a neutral answer [neither agree nor disagree]. I think it is the negation in the question that makes this question more difficult and prone to accidental incorrect answers. Maybe you can remove this negation in the question?</p>
Participant 2	<p>Regarding the statement: “This person is not necessarily speaking from his personal experience of dealing with hearing loss” - does this question ask me about whether I trust the fact that this text originates from this young man in the advertisement? Also, he does speak about his own experience, why would this question ask me the reverse? This may be confusing to the respondents. In addition, “This message originates from a reliable source” - does that mean marketing in general? Or is this question referring to the credibility of the person in the advertisement? I think you should review this question page for unclarities because I suppose that the respondent does not have access to extra explanation while completing the survey.</p>
Participant 3	<p>I think the first statement: “The advertisement's message is written by an expert on this topic” is a bit vague. I understand what the question is trying to ask, but I am not sure if a patient can be considered an expert. However, I think that he has extensive experience with hearing loss, so I would still consider him an expert. Aside from this, I think the questions were clear.</p>
Participant 4	<p>This question set felt slightly repetitive, especially statement 1, 2, and 4. The clarity and phrasing of the questions was in order.</p>
Participant 5	<p>The statement: “This person is not necessarily speaking from his personal experiences of dealing with hearing loss” is not entirely clear. The negation complicates the interpretation of the question. In addition, one</p>

	<p>could argue that the audiologist speaks from his personal experience as a practitioner. Thus, I think you could make this question clearer by reformulating the statement.</p>
Participant 6	<p>I find the statement: “This person is not necessarily speaking from his personal experiences of dealing with hearing loss” a bit confusing. This is because the text does not tell me whether the doctor in the advertisement personally also suffers from hearing loss or tinnitus. Other than that, the questions are fine.</p>
Participant 7	<p>I had to review the statement: “The message is communicated by a person with professional knowledge about hearing health” two times and felt the need to change my answer after. The person does talk about his experiences, so I am inclined to answer affirmatively right away, without considering the word professional, which he clearly isn’t. Maybe you can rephrase this statement in a way that stresses that this question is about someone’s professionalism specifically. For example, think about splitting the question into a ‘personal knowledge’ statement and ‘professional knowledge’. Also, the negation in the statement: “This person is not necessarily speaking from his personal experiences of dealing with hearing loss” is a bit confusing. The statement could also be made easier by removing the negation in the question.</p>
Participant 8	<p>The statement: “This person is not necessarily speaking from his personal experiences of dealing with hearing loss” is not clear enough in case you get presented with an advertisement featuring the doctor. The text says: ‘As an audiologist’, so I assume that this also refers to his personal experience as an audiologist. You should make the distinction between the personal and professional experience clearer in the question or advertisement text. Aside from this, I think the question set is clear and of good quality.</p>

Feedback on the manipulation check questions relating to source age

Participant 1	I would suggest that you state somewhere that the participant gets to see the same advertisement every time a new question set appears. I have no comments or questions about the statements, really. The advertisement provided sufficient visual information for me to answer the questions.
Participant 2	These questions were clear and easy. I have no further comments.
Participant 3	The first two questions that ask about my judgment on whether the person in the advertisement can be considered young are straightforward but may also be a bit confusing. The man in the advertisement is obviously young, but asking for confirmation about this somehow makes me question my judgment and think that it could be a trick question. Maybe you can give the respondents a heads up about this without framing them?
Participant 4	I think that 'young' is a subjective term, respondents may all have different perceptions of what young entails. The last part of the second statement, "like me" seems a bit odd. Additionally, the negation in the fourth statement makes the question a bit complicated, I had to read it three times. You could consider removing the negation and keep the question straight.
Participant 5	The questions were clear. I do have to mention that I do not find the doctor necessarily old, I think he looks middle-aged.
Participant 6	I see that the doctor is young, but based on this picture I cannot estimate whether he is much older than me. So, it is hard to give a strong-sided answer to the questions in this section.
Participant 7	This question set is clear. I have no further comments or questions.
Participant 8	I think the questions are easy to understand. Still, I think that the man in my advertisement cannot be considered senior. He is mature, but I do not consider him senior. Furthermore, I think it is quite random that these age questions about a person in the advertisement are asked. Maybe you can indicate why such questions are asked, as I did not expect them in a health-related survey.

Feedback on the message valence definition

Participant 1	The description seems clear to me.
Participant 2	I think the definition is fine.
Participant 3	I find the definition clear. I did not understand what it was at first, so I think it is good that you provided this definition in the first place.
Participant 4	The description was understandable, but I think you could replace message valence with a simpler term. Even though the definition provided is good, it may throw some respondents off, as you confront them with a complicated word. You could also opt for: 'the tone'.
Participant 5	I do not know the word message valence and I think it makes the interpretation of the question unnecessarily more difficult. I think you should remove 'message valence' from the question and use a less complicated term, like positive or negative, as is also mentioned in the definition below the question. Message valence is a scientific term, and your audience is probably not familiar with it.
Participant 6	I think the description of message valence is clear.
Participant 7	I have no problems with the definition.
Participant 8	All clear, I have no comments.

Feedback on the manipulation check questions relating to message valence

Participant 1	The questions cannot be answered instantly, I need to read them well. What is meant with effects? The advertisement does not really describe effects in my opinion. Also, my advertisement is rather positive, so why does it ask me whether it is negative? It seems that this question requires some thinking and reasoning before answering.
Participant 2	Although the statements were similar to each other, I found them clear. I think I understood well what this question was intended to measure.

Participant 3	These questions about tone are clear; it forces the viewer to thoroughly reflect on whether the text is positive or negative. I like that the advertisement is visible on every page, allowing me to read the text again.
Participant 4	You could add an asterisk after the word message valence if you decide to keep this term in your question as it refers to the definition below. The corresponding questions were clear.
Participant 5	This question set is slightly harder and requires some concentration. My comment on this question set is that after reviewing the text in the advertisement, about 90% of the text is negative and hardly emphasizes any positive aspects of good hearing health. However, the phrasing of the question could suggest that both should be reflected in the text, but this is not the case. Maybe you can have another look at the formulation of these two statements to make it more clear to the respondents that they should choose a side as to whether their advertisement text is positive or negative.
Participant 6	I find the questions okay; I do not experience any difficulties answering them. I have no further questions or comments on it.
Participant 7	These two questions are hard to comprehend. I had to read it multiple times. One could argue that both positive and negative sides are mentioned in the text, but it does not necessarily talk about effects as suggested by the question. So, I am not sure how to answer this question correctly. I think that these questions could be improved by rephrasing the statements. A better option could be: “Although this text warns of hearing loss, the message mostly has a positive tone”. Conversely: “Although this text warns of hearing loss, the message mostly has a negative tone.”
Participant 8	These two questions require the reader to read and consider the text in detail. I think it is hard to consider an advertisement that basically reflects a health warning as ‘positive’. Therefore, I am inclined to answer both questions negatively, although I do recognize that the advertisement also features some positive notes, this text still represents a warning.

Feedback on questions relating to attitude toward the advertisement

Participant 1	It was able to answer these questions quickly because the statements were constructed in a consistent manner. However, words like ‘credible’, ‘appealing’, ‘exaggerated’, and ‘delighted’ may be unknown to Dutch people. You could consider adding the Dutch translation behind that word. Other than that, the questions were not too long and clear.
Participant 2	You could add that the respondents should answer based on their first impression so that they do not spend too much time on this section. Still, I think the questions were clear, not too long, and easy to answer.
Participant 3	I liked the question set. I could answer quickly, and it was nice that the statements were all consistently formulated. Therefore, I think there were not too many questions. I only did not know what ‘delighted’ and ‘credible’ was. Maybe you can use an alternative or give the translation.
Participant 4	I do personally not see why ‘optimistic’ in this question set. Other than that, I find both question sets fine, easy to answer, and not too long.
Participant 5	I think the way that these question sets are set up is very clear. The terms were also familiar to me, but I do question the inclusion of ‘appealing’ in the first question set. I do not expect anyone to find a health-related warning to be appealing. Furthermore, the terms credible and convincing are synonymous to me. If someone is credible, this person is also convincing. So, I would omit one. The second question set is good as it is.
Participant 6	This question set is okay, and the terms are clear. There were quite a few questions, but it was easy to go through, so the length of the set is fine.
Participant 7	I think the question sets are clear. I only think that the term ‘credible’ will be unfamiliar to most Dutch people. Otherwise, the question sets were good, also in length.
Participant 8	The questions are short and evoke immediate emotional responses. It is not hard to fill them out. However, the word ‘delighted’ in the second question set is not entirely clear to me and the term also does not fit your question.

Feedback on questions relating to attitude toward wearing hearing protection

Participant 1	This question set was good and easy to understand. The length of the question set is also fine, it is not too tiring for the respondent.
Participant 2	I find these questions clear. I have no suggestions to improve it.
Participant 3	I think the questions are clear, there were not too many questions, and they were easier to understand in terms of English compared to the prior page.
Participant 4	Generally, I find the statements clear and easy. However, statement 6: "Wearing earplugs is uncomfortable" is a bit distracting, as the advertisement does not cover this. Besides, the respondent's answer will not be based on the advertisement. This question would probably fit better in the first section of the survey before the advertisement is shown.
Participant 5	These questions were easy and clear, I have nothing to add.
Participant 6	This question page is fine too. The questions refer to one's own opinion, so it is easy to fill in. The number of questions on this page is okay and the questions in itself are not so challenging to answer.
Participant 7	I think the question set is good in terms of language, level of difficulty, and length, I did not encounter any unclarities.
Participant 8	This question set was clear. Some questions are longer, maybe you can review these questions in terms of length or reformulate them. Other than that, I think the questions are relevant and easy to understand.

Feedback on questions relating to intention to wear hearing protection

Participant 1	The questions ask about my opinion, so I find it easy to answer them. Still, you should specify in statement 8 whether this concerns a situation in which I have control over the music in my own environment or whether I am in an environment where I cannot control the sound level. Finally, I think you made a good decision to first present the questions regarding the advertisement look and content instead of first asking about people's thoughts and behaviors. If it would be reversed, I think that people will doubt their previous answers. Thus, I would suggest keeping it this way.
Participant 2	The questions were also good, except for the last one: "I would rather turn down the volume than wearing hearing protection" – as it does not say whether I am in a public or private setting.
Participant 3	The questions were clear too. I think this question set required a bit more thinking, but I do not mind this.
Participant 4	This set is good in terms of understandability, relevance, and length.
Participant 5	I think this question set is a bit too long, especially if this survey is only supposed to take 5 minutes to complete. You do not want people to drop out at the very end of the survey.
Participant 6	I find this question set and its length okay, only the last statement is not clear to me. The statement is not specific enough, as it does not indicate whether you are in charge of the sound level. Therefore, this statement seems random and unclear to me.
Participant 7	The questions are good, except for the last statement: "I would rather turn down the volume than wearing hearing protection". The answer to the question is very context dependent. You should have another look at it.
Participant 8	This set was good too. I think that the questions are of good length, self-explanatory, and there are not too many. I only have a comment on the last statement; this statement does not indicate anything on the level of control that I have over the sound. This should be made more specific.

Feedback on the survey (general)

Participant 1	I found the survey generally easy to understand in terms of English, but I can imagine that not everyone would agree. You could have another look to see where you could make the language in the survey easier.
Participant 2	It took me longer than the expected five minutes to complete the survey. I think it takes around ten minutes. I think you should change that in your introduction meet the expectations. Moreover, I think you can add that the respondents should give their 'first impression answer' for some questions.
Participant 3	I do not have any other comments or suggestions on the survey, I mentioned everything already before.
Participant 4	I am not sure whether this is possible in Qualtrics, but you could add a progress bar at the top of each page to give the respondent an idea of where they are in the survey. I think it will be encouraging to the respondent. If this is not possible, you may choose to add numbers to inform the respondents on their progress.
Participant 5	It would be nice if you would add question or page numbers or give some sort of indication of the survey progress. Besides this, you could also make the variables in your questions bold to emphasize this to your respondents.
Participant 6	I think I have covered everything already. I cannot think of any other suggestions for improvement.
Participant 7	I would advise you to eliminate the negations in your statements or keep it very minimal. These types of statements may result in incorrect answers, even though your respondent intends to give the 'correct' answer. So, I think you should either make the negation bold in your question or rephrase the question in a way that it does not contain a negation anymore. Finally, I think that the time to complete the survey would be around seven minutes instead of five. Perhaps you could amend this in the introduction.
Participant 8	I would review the longer questions and shorten these where possible. Overall, I think you have created a nice survey that was not too long.

PART II: STIMULI MATERIAL FEEDBACK

<p>Condition 1: expert – older – positive</p>	<p>Condition 2: expert – older – negative</p>
<p>“ Listen carefully</p> <p>“As an audiologist, I know how important it is to protect your hearing health. By practicing safe listening and wearing earplugs, you can prevent permanent hearing loss and tinnitus, and continue to enjoy the wonderful sounds of life, even at loud events.</p> <p>Do not let hearing loss and tinnitus steal the joy of hearing and life from you. As someone who sees the profound impact of hearing loss on patients daily, I urge you to invest in your hearing health today to cherish the sweet sounds of life for years to come.”</p> <p>— Dr. Thomas L. Myers, Audiologist</p> 	<p>“ Listen carefully</p> <p>“As an audiologist, I know how important it is to protect your hearing health. Falling to practice safe listening and wearing earplugs can result in permanent hearing loss and tinnitus, which can have a devastating impact on your ability to enjoy the wonderful sounds of life, including music events.</p> <p>Do not wait for these terrible conditions to happen to you. As someone who sees the negative consequences of hearing loss on patients daily, I urge you to invest in your hearing health today or you may spend your future filled with ringing or silence.”</p> <p>— Dr. Thomas L. Myers, Audiologist</p> 
<p>Condition 3: expert – younger – positive</p>	<p>Condition 4: expert – younger – negative</p>
<p>“ Listen carefully</p> <p>“As an audiologist, I know how important it is to protect your hearing health. By practicing safe listening and wearing earplugs, you can prevent permanent hearing loss and tinnitus, and continue to enjoy the wonderful sounds of life, even at loud events.</p> <p>Do not let hearing loss and tinnitus steal the joy of hearing and life from you. As someone who sees the profound impact of hearing loss on patients daily, I urge you to invest in your hearing health today to cherish the sweet sounds of life for years to come.”</p> <p>— Dr. Thomas L. Myers, Audiologist</p> 	<p>“ Listen carefully</p> <p>“As an audiologist, I know how important it is to protect your hearing health. Falling to practice safe listening and wearing earplugs can result in permanent hearing loss and tinnitus, which can have a devastating impact on your ability to enjoy the wonderful sounds of life, including music events.</p> <p>Do not wait for these terrible conditions to happen to you. As someone who sees the negative consequences of hearing loss on patients daily, I urge you to invest in your hearing health today or you may spend your future filled with ringing or silence.”</p> <p>— Dr. Thomas L. Myers, Audiologist</p> 
<p>Condition 5: patient – older – positive</p>	<p>Condition 6: patient – older – negative</p>
<p>“ Listen carefully</p> <p>“As a hearing loss patient, I know firsthand how important it is to protect your hearing health. By practicing safe listening and wearing earplugs, you can prevent permanent hearing loss and tinnitus, and continue to enjoy the wonderful sounds of life, even at loud events.</p> <p>Do not let hearing loss and tinnitus steal the joy of hearing and life from you. As someone who experiences the profound impact of hearing loss daily, I urge you to invest in your hearing health today to cherish the sweet sounds of life for years to come.”</p> <p>— Thomas L. Myers, Hearing loss patient</p> 	<p>“ Listen carefully</p> <p>“As a hearing loss patient, I know firsthand how important it is to protect your hearing health. Falling to practice safe listening and wearing earplugs can result in permanent hearing loss and tinnitus, which can have a devastating impact on your ability to enjoy the wonderful sounds of life, including music events.</p> <p>Do not wait for these terrible conditions to happen to you like I did. As someone who experiences the negative consequences of hearing loss daily, I urge you to invest in your hearing health today or you may spend your future filled with ringing and silence.”</p> <p>— Thomas L. Myers, Hearing loss patient</p> 
<p>Condition 7: patient – younger – positive</p>	<p>Condition 8: patient –younger – negative</p>
<p>“ Listen carefully</p> <p>“As a hearing loss patient, I know firsthand how important it is to protect your hearing health. By practicing safe listening and wearing earplugs, you can prevent permanent hearing loss and tinnitus, and continue to enjoy the wonderful sounds of life, even at loud events.</p> <p>Do not let hearing loss and tinnitus steal the joy of hearing and life from you. As someone who experiences the profound impact of hearing loss daily, I urge you to invest in your hearing health today to cherish the sweet sounds of life for years to come.”</p> <p>— Thomas L. Myers, Hearing loss patient</p> 	<p>“ Listen carefully</p> <p>“As a hearing loss patient, I know firsthand how important it is to protect your hearing health. Falling to practice safe listening and wearing earplugs can result in permanent hearing loss and tinnitus, which can have a devastating impact on your ability to enjoy the wonderful sounds of life, including music events.</p> <p>Do not wait for these terrible conditions to happen to you like I did. As someone who experiences the negative consequences of hearing loss daily, I urge you to invest in your hearing health today or you may spend your future filled with ringing and silence.”</p> <p>— Thomas L. Myers, Hearing loss patient</p> 

Feedback on advertisement conditions 1 and 2

Participant 1	The doctor in these advertisements looks old but friendly. He comes across as an expert, as the text and photos clearly indicate that he is an audiologist. Text 1 is obviously more positive than the second one because the first one is more geared toward preservation, whereas the second one focuses more on what a hearing loss patient could miss out on.
Participant 2	This doctor looks very trustworthy and seems like a father figure. Furthermore, the difference between the positive and negative version is clear because of the wording used in the different advertisements.
Participant 3	The audiologist in these advertisements looks very experienced. He radiates authority through his title, age, and of course his uniform. I find the advertisements both informative and formal, so not really personal.
Participant 4	I can see a senior doctor and the text confirms that he has professional experience. I think he looks gentle and corresponds well to the texts. The positive and negative versions are easy to distinguish.
Participant 5	The doctor in these advertisements looks middle-aged, about 45 to 50. I find the difference between the positive and negative text clear, though I can tell that the negative version has more impact on me. I find the negative text in combination with this doctor more convincing.
Participant 6	I see an older man who has a gray beard and is wearing a doctor's uniform. He looks older than the doctor I have seen before and seems a bit more confident. The positive and negative texts are easy to distinguish.
Participant 7	The advertisements show a doctor who talks about hearing health by wearing earplugs. He looks senior and wears a uniform. The texts are very alike, but I think one text is more positive than the other.
Participant 8	These advertisements show an experienced doctor who warns about hearing loss and promotes hearing protection. One advertisement warns in a more negative tone than the other, as that one is more vocal about the consequences of living with hearing loss compared to the other.

Feedback on advertisement conditions 3 and 4

Participant 1	<p>The doctor in these advertisements is definitely younger compared to the doctor advertisement 1 and 2. I think I may trust the younger doctor more, as he seems to have graduated recently, and therefore has up-to-date knowledge on this area. The older doctor probably relies more on his extensive experience in the field rather than new insights and developments. In addition, the younger doctor seems more identifiable to me than the older doctor. It is refreshing to see a younger doctor as an endorser in an advertisement. Overall, I think that a young doctor in combination with a positive text has the most effect on me.</p>
Participant 2	<p>I see a doctor here, but he is younger than the doctor I have just seen. This younger doctor in combination with the negatively loaded advertisement makes me laugh a bit and question his authority. He could also be a person that goes to clubs, enjoying loud music, yet he seems to teach me a lesson here. This combination of a young doctor and a negative text evokes negative feelings for me personally. The positive version of this advertisement, however, does seem convincing, but I cannot explain why.</p>
Participant 3	<p>I can immediately see that this doctor is significantly younger. He looks less authoritative to me and could also appear in a dentist advertisement. Somehow the negative version of this advertisement with the young doctor seems even more negative than the negative version of the old doctor. I find the younger doctor less credible because of his looks and age.</p>
Participant 4	<p>This second doctor looks significantly younger and less sympathetic than the first doctor. Still, I have a problem with: “The person in the advertisement looks young, like me” because it may imply that he shares the same age with me, but he clearly does not. It is a bit of an unfortunate phrasing. I would suggest you first ask the respondent: “I consider myself young” and then ask whether the respondent also perceives the person in the advertisement as “young”. As for the difference between the positive and negative texts, I think the difference is very clear. The young doctor in combination with the negative text sparks adverse feelings in me.</p>

Participant 5	This doctor is obviously younger, I think he looks about 15 years younger than the doctor before. I can tell that the texts are consistent with the texts I have seen with the older doctor. The younger doctor has less impact on me, because he looks like he has just graduated and conveys less authority and confidence in my opinion. On a critical note, the older doctor wears a tie, whereas the younger doctor does not. The presence of a tie may also influence or even improve the credibility perception of the doctor. Otherwise, the manipulations are very well applied to the advertisements.
Participant 6	This is the same younger doctor that I have seen before. As was the case with the previous advertisements, the difference between the positive and negative texts is clear.
Participant 7	This doctor is younger and looks a little less professional than the senior doctor I saw a minute ago. The texts are still clear and convincing. However, I find the positive version of the young doctor more impactful than the negative version.
Participant 8	These advertisements use a younger doctor but contain the same positive and negative texts. Again, the difference between the positive and negative version is clear. This younger doctor does not necessarily evoke different emotions. The use of a different doctor has no effect on the message transmission for me.

Feedback on advertisement conditions 5 and 6

Participant 1	The photo and text are pitiful, but he does not seem convincing. It is probably because of his age. He is certainly in a different age category than me, so I do not feel like I can relate to him. I feel for him, but at the same time I feel like I cannot do anything about it. I guess he and I are too different from each other for the advertisement to have an effect on me.
Participant 2	This man looks like he has just retired. This old man does not spark any feelings in me to be honest. I feel sorry for him, but I cannot identify myself with him, so I am more inclined to disregard his message.

Participant 3	These advertisements use an old man. I recognize this fifth advertisement from the survey. In retrospect I would reevaluate my judgment and consider this text more positive rather than negative. Still, I do not like these advertisements with the old man a lot because it feels like my granddad is teaching me a lesson about the way I live my life and my hearing health.
Participant 4	This man looks absolutely senior and like a sad puppy. Again, the difference in age and the texts is clear. I have nothing more to add.
Participant 5	This man looks less convincing than the doctors. He arouses pity because of his gaze, he looks concerned and looks like he has a condition. Still, I think he matches the text and research context. The difference between the positive and negative text was well recognizable.
Participant 6	I see a man with gray hair and beard, wearing formal clothes. I would classify him as a senior person. I think that the texts are very similar to the texts in the doctor advertisements. Likewise, the difference between the positive and negative text is sufficiently clear.
Participant 7	I think this is supposed to reflect an old man who deals with hearing loss himself. I can imagine that he has developed hearing loss at a later stage in life, not particularly at a young age. The differences between the positive and negative text from a patient perspective is also evident.
Participant 8	I see that these advertisements use an old pitiful man who suffers from hearing loss and tinnitus. I think that the positive advertisement text could be made somewhat more positive, as I did not experience this 'positive' advertisement as positive at first, only after I read the negative advertisement.

Feedback on advertisement conditions 7 and 8

Participant 1	<p>I can tell I immediately feel more sorry for this young man than the older man I have seen previously. It gives me so much more sense of urgency. Because he is young too, I think it can also happen to me. The older man had a way longer life and has probably been exposed to more sound in his lifetime than this young man. If this young man already suffers from hearing problems, I should feel more worried too and do more to protect my hearing. Again, the positive version with the young man has the most effect on me. All in all, I find the patient advertisements more convincing than the doctor advertisements because the patients actually suffer from it, so I think that they are the most suitable persons to provide advice and stress the importance of wearing hearing protection. The doctors can only advise about this from a professional point of view rather than an emotional and experience perspective like patients.</p>
Participant 2	<p>I think this young man is much more relatable and appealing than the older man. The fact that he suffers from hearing loss at a young age already worries me and motivates me to take actions in favor of my hearing health.</p>
Participant 3	<p>This man looks much younger, and he seems closer to me in age. I feel like I can identify with him and his story because of his age. His age in combination with the story suggests that he could share the same lifestyle habits as me. Whereas the doctor advertisements feel like warnings, these advertisements feel like testimonials, even though the texts are virtually the same. As a result, the advertisement feels more personal. Hence, these advertisements appeal more to me than the previous ones and have a greater effect on me. In addition, the distinction between the positive and negative version of these advertisements is also clear.</p>
Participant 4	<p>This young man does not evoke any guilt feelings in me, the fact that he has hearing loss is entirely on him. It is sad that he suffers from this condition, but it does not have much effect on me, regardless of the positive or negative text version.</p>

Participant 5	<p>The person in these advertisements looks young and the text and picture sufficiently convince me that he represents a hearing loss patient. I think he has the most impact on me, given his young age and the fact that he is already suffering from hearing loss. Although I can identify the positive and negative text, both advertisements come across as negative because of the sad situation that this young man is in, regardless of the fact that one text was clearly more positive. All in all, the young man in combination with the negative text has had the most impact on me.</p>
Participant 6	<p>This person is much younger than the patient I have seen in the advertisements before. The texts of these advertisements are identical to the texts with the older patient.</p>
Participant 7	<p>I think that the use of a young person in this type of advertisement is good. He looks most relatable to young adults in terms of appearance, age, and lifestyle. Therefore, I think he is most convincing when it comes to warning for hearing loss; he has experience with the sound levels in clubs and developed hearing loss as a result. Therefore, I take him most seriously of all persons shown, surpassing even the senior doctor.</p>
Participant 8	<p>I think that this young man is most relatable to me. He looks like a peer person and tries to warn other young adults about hearing loss and tinnitus. I think I like this man best and that he has the most impact on me in terms of message delivery. As was the case for the previous patient advertisements, the positive text could be made more positive.</p>

Feedback on an alternative picture for older patient condition

Option 1: Original older patient

Option 2: Alternative older patient



Participant 1	The alternative option is better. He looks less pitiful than option 1. Furthermore, he is still clearly older than your target group, which is good.
Participant 2	The man in the second option looks much healthier compared to the other old man which was featured in the advertisement first. That man looks like he just left the hospital. I also think that this new man fits the sound/music aspect mentioned in the advertisement better. He looks like he is actually visiting bars or concerts. He also looks more relatable because he is not wearing a tight shirt but a relaxed blouse, which is something that younger people could also wear when attending music events.
Participant 3	The first option looks dull and older than the alternative option you have just shown. This man with the red blouse looks a bit more outgoing and sympathetic. He looks like a person who you could stumble upon while doing the groceries, however, he still looks old enough to be considered senior. Finally, I think that this alternative option is more similar in age and appearance to the senior doctor in advertisement 1 and 2 compared to the first option. So, I would advise you to opt for this new senior man.

Participant 4	The first option looks sadder compared to the other persons. I think the second option looks less like a mugshot and more appealing. Therefore, I would suggest you choose the second option for your main experiment.
Participant 5	The first man has a concerned look on his face, but the alternative man that you have just presented looks ‘too happy’ in my opinion, as if he has just returned from a festival. He does not really look like a patient; I take him less seriously than the man you have selected in the advertisement. Therefore, I would keep the first option.
Participant 6	This new man looks more vital than the previous older man but is still senior. However, I do not think that the senior man used in the advertisements looked particularly sick or pitiful. I think that the new man you have just shown is less suitable for the advertisement. He looks a bit smug and the picture in general is a little less consistent with the style you reflected in the other advertisements. So, for the sake of consistency, I think you should keep the picture with the first old man.
Participant 7	I think that the man in the first option man looks a bit sad. I find the attitude of the new man you have just shown more appealing, as he looks less sad. I would prefer option 2.
Participant 8	The man used in the first advertisements looks timid and a bit pitiful, but most of all, he looks sick in his face. The second man looks more like a ‘real’ hearing loss patient, who commonly do not show any physical signs of sickness. This second man also looks approachable and confident. However, I think he still has a more or less neutral facial expression. This man looks like he could be your uncle who also happens to have tinnitus. All in all, I think that option 2 is more suitable than option 1.

Appendix C: Experiment

Survey flow

Block: Introduction to the research and survey (1 Question)

Standard: Demographic information (3 Questions)

Standard: Power distance to doctors and attitude toward hearing health (4 Questions)

Standard: Advertisement explanation (1 Question)

BlockRandomizer: 1 - Evenly Present Elements

Standard: Condition 1: Audiologist - older - positive (13 Questions)

Standard: Condition 2: Audiologist - younger - positive (13 Questions)

Standard: Condition 3: Audiologist - older - negative (13 Questions)

Standard: Condition 4: Audiologist - younger - negative (13 Questions)

Standard: Condition 5: Patient - older - positive (13 Questions)

Standard: Condition 6: Patient - younger - positive (13 Questions)

Standard: Condition 7: Patient - older - negative (13 Questions)

Standard: Condition 8: Patient - younger - negative (13 Questions)

EndSurvey: Advanced

Page Break

Start of Block: Introduction to the research and survey

Dear participant,

Thank you for taking the time to participate in this survey, your answers are highly appreciated. This research is conducted by Eline Silven, master student at the Faculty of Behavioral Management and Social Sciences at the University of Twente (Enschede, The Netherlands).

This study aims to develop a better understanding of the factors that influence changes in people's health behaviors. Although the survey is in English, there are some Dutch translations included for Dutch respondents. If you do not understand Dutch, you can ignore these translations. The survey takes approximately 5 to 10 minutes to complete.

Your participation is completely voluntary. Your responses are anonymous and will remain confidential. However, if you feel uncomfortable answering any of the questions, you may withdraw from the survey at any point. There are no foreseeable risks associated with this research or participation to this survey. If you have any questions about the research, survey, or the procedure, you may contact c.e.h.m.silven@student.utwente.nl.

Before you can start the survey, you must agree to the information presented above.

Thank you again for your time and participation.

- I have read the text and agree to the information presented above.

End of Block: Introduction to the research and survey

Start of Block: Demographic information

Demographics

Please be reminded that all your answers are anonymous, untraceable, and confidential.

What is your gender?

- Male
- Female
- Other
- Prefer not to say
-

What is your age?

Age: _____

What is your highest level of **completed** education?

- No formal education
- High school (*NL: middelbare school*)
- Vocational training (*NL: MBO-opleiding*)
- Bachelor's degree from a university of applied sciences (*NL: HBO-bachelor*)
- Bachelor's degree from a university (*NL: WO-bachelor*)
- Master's degree (*NL: WO-master*)
- Doctorate / PhD
- Other, please specify:

End of Block: Demographic information

Start of Block: Power distance and attitude toward hearing health

Thinking of **health advice**, to what extent do you agree to the following statements?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I consider doctors to be a health authority.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I accept the advice given by a doctor without questioning.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I highly value the advice given by a doctor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel intimidated by doctors and hesitate to express my opinions or concerns to them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel uncomfortable questioning a doctor's opinion or advice.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patients with much experience can also provide reliable advice about their health condition to others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Thinking of **health** and **hearing health**, to what extent do you agree to the following statements?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I am concerned about public health issues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I pay much attention to my health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think my hearing health is important.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am worried about my <u>current</u> hearing health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find hearing protection devices such as earplugs helpful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wearing earplugs is comfortable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is necessary to use earplugs at loud venues like clubs or concerts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hearing loss and tinnitus are serious health problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good hearing improves the quality of my life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page Break

Have you ever experienced any type of hearing-related problems, such as hearing loss or tinnitus*? These do not have to be confirmed by a doctor.

** Tinnitus is a condition in which a person perceives a sound within the ear that is not caused by an external source. It is often described as 'ringing in the ears'.*

Yes

No

If 'Yes' is selected, go to:

Is your hearing problem temporary or permanent?

Temporary

Permanent

End of Block: Power distance and attitude toward hearing health

Start of Block: Advertisement explanation

On the next pages, you will be presented with an advertisement, followed by various questions. The **same advertisement** will be shown on each page.

End of Block: Advertisement explanation

Start of Block: Condition 1: Audiologist - older – positive

* One of the eight possible advertisements is shown here, an overview of all stimuli can be found in Appendix D. The advertisements were presented in a larger size during the experiment.

Consider the advertisement below.

Which answer best reflects your opinion about the **person** in the advertisement?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I think this person is an expert on this topic.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think this person is a reliable source for hearing health advice.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This person has professional knowledge about hearing health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This person primarily speaks from his professional practice rather than personal experience.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

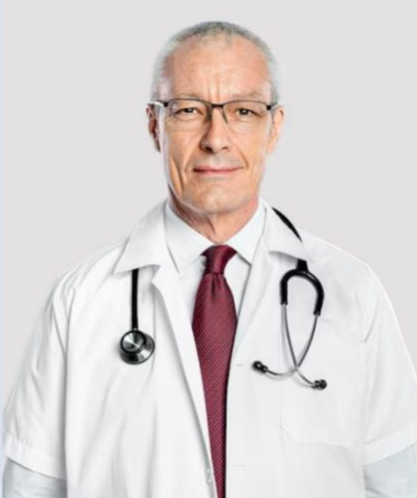
Consider the advertisement below.

“ Listen carefully

“As an audiologist, I know how important it is to protect your hearing health. By practicing safe listening and wearing earplugs, you can prevent permanent hearing loss and tinnitus, and continue to enjoy the wonderful sounds of life, even at loud events.

Do not let hearing loss and tinnitus take the joy of hearing and life from you. As someone who sees the profound impact of hearing loss on patients daily, I encourage you to invest in your hearing health today to cherish the sweet sounds of life for years to come.”

— Dr. Thomas L. Myers, [Audiologist](#)



Which answer best reflects your opinion about the **person’s age** in the advertisement compared to you?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I consider myself young.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think this person is young.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think this person is senior-aged.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel like there is much age difference between me and this person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page Break

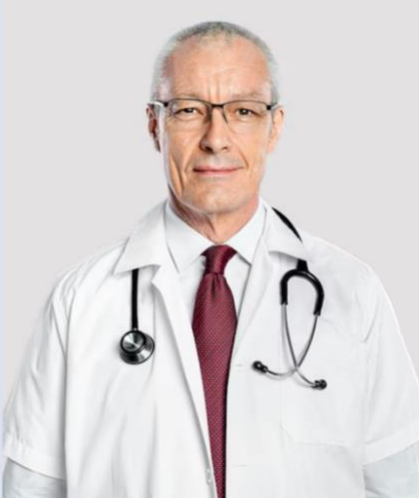
Consider the advertisement below.

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“As an audiologist, I know how important it is to protect your hearing health. By practicing safe listening and wearing earplugs, you can prevent permanent hearing loss and tinnitus, and continue to enjoy the wonderful sounds of life, even at loud events.

Do not let hearing loss and tinnitus take the joy of hearing and life from you. As someone who sees the profound impact of hearing loss on patients daily, I encourage you to invest in your hearing health today to cherish the sweet sounds of life for years to come.”

— Dr. Thomas L. Myers, [Audiologist](#)



Which answer best reflects your opinion about the **text** in the advertisement?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
This text mostly uses a positive tone to promote hearing health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This text mostly uses a negative tone to promote hearing health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page Break

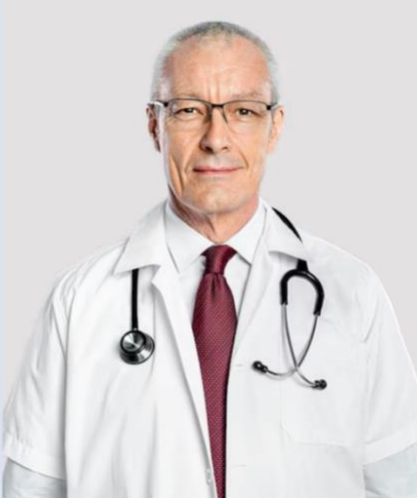
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— Dr. Thomas L. Myers, [Audiologist](#)



Which answer best reflects your opinion about the advertisement?

I think the advertisement..

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Gives me something to think about.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is clear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is interesting.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is credible (NL: geloofwaardig).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is convincing (NL: overtuigend).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is appealing (NL: pakkend).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is exaggerated (NL: overdreven).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

This advertisement makes me feel...

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Positive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Motivated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Happy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Guilty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worried	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Annoyed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page Break

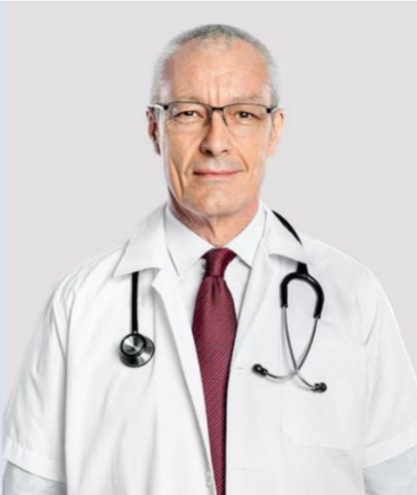
Consider the advertisement below.

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Do not let hearing loss and tinnitus take the joy of hearing and life from you. As someone who sees the profound impact of hearing loss on patients daily, I encourage you to invest in your hearing health today to cherish the sweet sounds of life for years to come.”

— Dr. Thomas L. Myers, [Audiologist](#)



After viewing this advertisement, I think that..

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Wearing earplugs is wise.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Earplugs are effective in protecting hearing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can handle loud noise without protection.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wearing earplugs at loud events is beneficial.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The advantages of wearing earplugs are greater than the disadvantages.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am more worried about hearing problems if I don't wear earplugs at loud events.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Earplugs are useful for everyone, not just for those who already have hearing problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page Break

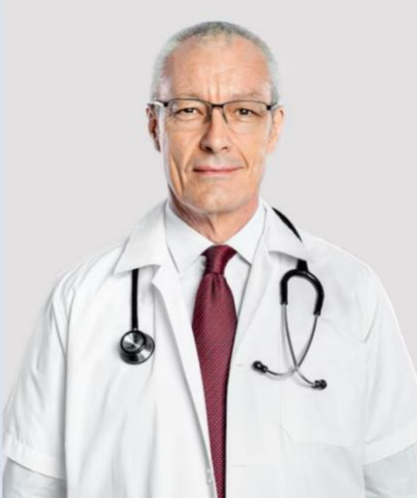
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— Dr. Thomas L. Myers, [Audiologist](#)



After viewing this advertisement, I think...

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I am more willing to wear hearing protection.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intend to wear earplugs at loud events to prevent damage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When earplugs are around when I need them, I will use them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am committed to wearing earplugs to maintain my hearing health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am willing to wear earplugs, even if it is a bit uncomfortable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I plan to wear earplugs, even if I am the only one among my friends who does.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Condition 1: Audiologist - older - positive

End of Survey

Thank you for your participation. Your response has been recorded.

If you have any questions or remarks, you may contact c.e.h.m.silven@student.utwente.nl

Appendix D: Stimuli material

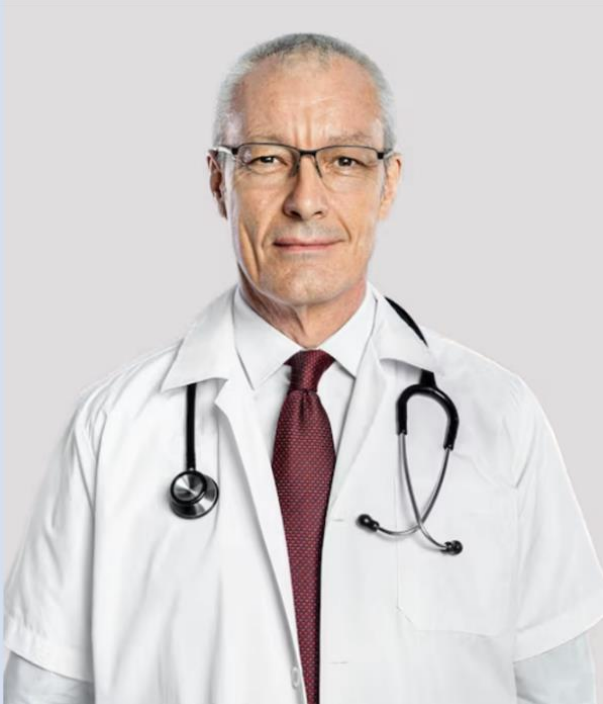
Condition 1: Expert endorser – older – positive message valence

“ Listen carefully

“As an audiologist, I know how important it is to protect your hearing health. By practicing safe listening and wearing earplugs, you can prevent permanent hearing loss and tinnitus, and continue to enjoy the wonderful sounds of life, even at loud events.

Do not let hearing loss and tinnitus take the joy of hearing and life from you. As someone who sees the profound impact of hearing loss on patients daily, I encourage you to invest in your hearing health today to cherish the sweet sounds of life for years to come.”

— Dr. Thomas L. Myers, [Audiologist](#)




Condition 2: Expert endorser – younger – positive message valence

“ Listen carefully

“As an audiologist, I know how important it is to protect your hearing health. By practicing safe listening and wearing earplugs, you can prevent permanent hearing loss and tinnitus, and continue to enjoy the wonderful sounds of life, even at loud events.

Do not let hearing loss and tinnitus take the joy of hearing and life from you. As someone who sees the profound impact of hearing loss on patients daily, I encourage you to invest in your hearing health today to cherish the sweet sounds of life for years to come.”

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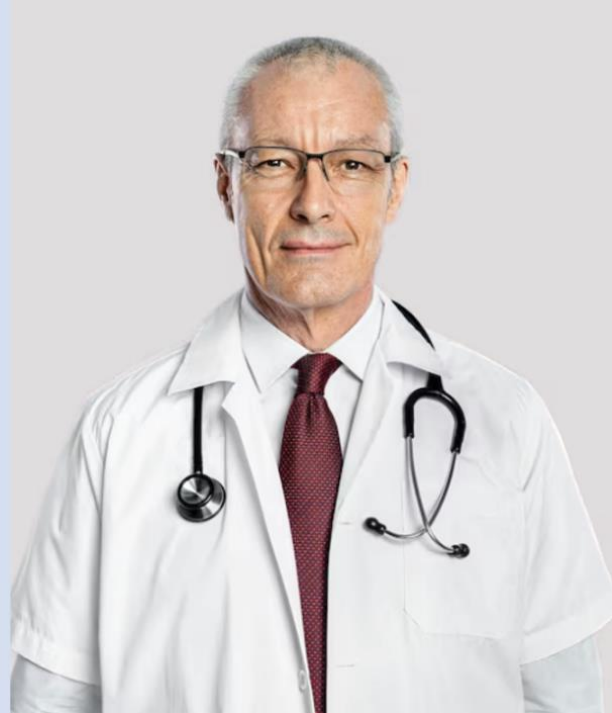
Condition 3: Expert endorser – older – negative message valence

“ **Listen carefully**

“As an audiologist, I know how important it is to protect your hearing health. Failing to practice safe listening and not wearing earplugs can result in permanent hearing loss and tinnitus, which can have a devastating impact on your ability to enjoy the wonderful sounds of life, including music events.

Do not wait for these terrible conditions to happen to you. As someone who sees the negative consequences of hearing loss on patients daily, I urge you to invest in your hearing health today or you may spend your future filled with ringing or silence.”

— Dr. Thomas L. Myers, [Audiologist](#)



Condition 4: Expert endorser – younger – negative message valence

“ **Listen carefully**

“As an audiologist, I know how important it is to protect your hearing health. Failing to practice safe listening and not wearing earplugs can result in permanent hearing loss and tinnitus, which can have a devastating impact on your ability to enjoy the wonderful sounds of life, including music events.

Do not wait for these terrible conditions to happen to you. As someone who sees the negative consequences of hearing loss on patients daily, I urge you to invest in your hearing health today or you may spend your future filled with ringing or silence.”

— Dr. Thomas L. Myers, [Audiologist](#)



Condition 5: Experience endorser – older – positive message valence

“ Listen carefully

“As a hearing loss patient, I know firsthand how important it is to protect your hearing health. By practicing safe listening and wearing earplugs, you can prevent permanent hearing loss and tinnitus, and continue to enjoy the wonderful sounds of life, even at loud events.

Do not let hearing loss and tinnitus take the joy of hearing and life from you. As someone who experiences the profound impact of hearing loss daily, I encourage you to invest in your hearing health today to cherish the sweet sounds of life for years to come.”

— Thomas L. Myers, [Hearing loss patient](#)



Condition 6: Experience endorser – younger – positive message valence

“ Listen carefully

“As a hearing loss patient, I know firsthand how important it is to protect your hearing health. By practicing safe listening and wearing earplugs, you can prevent permanent hearing loss and tinnitus, and continue to enjoy the wonderful sounds of life, even at loud events.

Do not let hearing loss and tinnitus take the joy of hearing and life from you. As someone who experiences the profound impact of hearing loss daily, I encourage you to invest in your hearing health today to cherish the sweet sounds of life for years to come.”

— Thomas L. Myers, [Hearing loss patient](#)



Condition 7: Experience endorser – older – negative message valence

“ Listen carefully

“As a hearing loss patient, I know firsthand how important it is to protect your hearing health. Failing to practice safe listening and not wearing earplugs can result in permanent hearing loss and tinnitus, which can have a devastating impact on your ability to enjoy the wonderful sounds of life, including music events.

Do not wait for these terrible conditions to happen to you like I did. As someone who experiences the negative consequences of hearing loss daily, I urge you to invest in your hearing health today or you may spend your future filled with ringing or silence.”

— Thomas L. Myers, [Hearing loss patient](#)



Condition 8: Experience endorser – younger – negative message valence

“ Listen carefully

“As a hearing loss patient, I know firsthand how important it is to protect your hearing health. Failing to practice safe listening and not wearing earplugs can result in permanent hearing loss and tinnitus, which can have a devastating impact on your ability to enjoy the wonderful sounds of life, including music events.

Do not wait for these terrible conditions to happen to you like I did. As someone who experiences the negative consequences of hearing loss daily, I urge you to invest in your hearing health today or you may spend your future filled with ringing or silence.”

— Thomas L. Myers, [Hearing loss patient](#)



230702 REQUEST FOR ETHICAL REVIEW

Request number: 230702
Researcher: Silven, C.E.H.M.
Supervisor: Karreman, J.
Reviewer: Zeeuw, A. van der
Status: Approved by commission
Version: 2

1. START

A. TITLE AND CONTEXT OF THE RESEARCH PROJECT

1. What is the title of the research project? (max. 100 characters)

Listen carefully

2. In which context will you conduct this research?

Master's Thesis

3. Date of the application

21-04-2023

5. Is this research project closely connected to a research project previously assessed by the BMS Ethics Committee?

No/Unknown

B. CONTACT INFORMATION

6. Contact information for the lead researcher

6a. Initials: C.E.H.M.
6b. Surname: Silven
6c. Education/Department (if applicable): M-COM
6d. Staff or Student number: 2723301
6e. Email address: c.e.h.m.silven@student.utwente.nl
6f. Telephone number: XXXXXXXXXX

6g. If additional researchers (students and/or staff) will be involved in carrying out this research, please name them:

Not applicable

6h. Have you completed a PhD degree?

No

7. Contact information for the BMS Supervisor

7a. Initials: J.
7b. Surname: Karreman
7c. Department: BMS-CS
7d. Email address: j.karreman@utwente.nl
7e. Telephone number: [REDACTED]

8. Is one of the ethics committee reviewers involved in your research? Note: not everyone is a reviewer.

No

C. RESEARCH PROJECT DESCRIPTION

9a. Please provide a brief description (150 words max.) of the background and aim(s) of your research project in non-expert language.

This thesis involves an experimental study on the effects of source credibility, source similarity, and message valence in social marketing advertisements on young adults' attitudes and behavioral intentions toward wearing hearing protection. This research is of importance as noise-induced hearing loss and tinnitus have become major public health issues today, especially among young adults between 18 and 35 due to their frequent voluntary exposure to excessive sound levels and nonuse of hearing protection. These conditions could have detrimental health consequences, including social isolation and depression, reducing people's general quality of life. Scholars suggest that a shift in young adults' attitudes toward hearing health is therefore necessary to effectuate changes in their hearing protection behaviors. Given that this age group is frequently exposed to advertisements, social marketing initiatives using advertising to promote hearing protection messages are considered a promising approach to effectuate a change in their hearing protection attitudes and behaviors. However, literature on persuasive advertising strategies that are effective and appropriate for social marketing purposes is lacking, as the field simply replicates the persuasion strategies used in commercial advertising without conducting prior research to verify their appropriateness and effectiveness in social contexts. Therefore, this study will test the effects of source credibility, source similarity, and message valence in social marketing advertisements, as they have not been validated in this context before. A 2 (source: audiologist vs. source: patient) x 2 (similar: young adult vs. dissimilar: senior person) x 2 (message valence: positive vs. negative) between-subject experiment will be conducted (after a pre-test round) to explore which advertisement has the biggest persuasive impact on young adults' attitudes and behavioral intentions toward wearing hearing protection.

9b. Approximate starting date/end date of data collection:

Starting date: 2023-04-30

End date: 2023-05-15

9c. If applicable: indicate which external organization(s) has/have commissioned and/or provided funding for your research.

Commissioning organization(s):

Not applicable

Funding organization(s):

Not applicable

2. TYPE OF STUDY

Please select the type of study you plan to conduct:

I will be collecting new data from individuals acting as respondents, interviewees, participants, or informants.

4. RESEARCH INVOLVING THE COLLECTION OF NEW DATA

A. RESEARCH POPULATION

20. Please provide a brief description of the intended research population(s):

For my thesis project, I will conduct an online survey targeting young adults aged 18 to 35 (excluding minors). Participants will be randomly assigned to one out of eight experimental advertising conditions and asked to complete questions that relate to the hearing health advertisement.

21. How many individuals will be involved in your research?

As I need 30 individuals per experimental advertising condition to attain a normal distribution across all experimental conditions, I plan to include $8 \times 30 = 240$ individuals in my research.

22. Which characteristics must participants/sources possess in order to be included in your research?

The participant must be a Western European aged between 18 to 35 years. There are no further restrictions with regard to gender, educational level, or personal characteristics.

23. Does this research specifically target minors (<16 years), people with cognitive impairments, people under institutional care (e.g. hospitals, nursing homes, prisons), specific ethnic groups, people in another country or any other special group that may be more vulnerable than the general population?

No

24. Are you planning to recruit participants for your research through the BMS test subject pool, SONA?

No

B. METHODS OF DATA COLLECTION

25. What is the best description of your research?

Online survey research

26. Please provide a brief yet sufficiently detailed overview of activities, as you would in the Procedure section of your thesis or paper. Among other things, please provide information about the information given to your research population, the manipulations (if applicable), the measures you use (at construct level), etc. in a way that is understandable for a relative lay person.

The participant will be introduced to the research and survey first. This introduction thanks the participant for taking part in the survey, mentions who executes the research (my name, study faculty, my university name and university location). After, the research nature (data collection for thesis research), purpose, background and goal are briefly explained.

The final part of this introduction section covers the:

- participant's voluntariness of participation
- participant's anonymity and confidentiality protection of the answers provided by the participant
- foreseeable risks or discomfort associated with the participation to this survey (none)
- participant's right to withdraw from the research at any time
- the expected time to complete the survey (= 5 minutes)
- my school email address to which the participants may reach out to for further questions regarding the survey, research procedure, or other concerns

Finally, the introduction thanks the participant once again and states that they must agree to the terms and conditions in order to start the survey. This has to be done by ticking the box at the end of the introduction that says: "I have read the text above and agree to the terms and conditions."

The second part of the survey comprises three anonymous demographic questions. As a result, the information collected from this segment will not enable me to identify individual participants.

- Q1 asks the participant to indicate their gender (includes the option: prefer not to say)
- Q2 asks the participant to fill in their age
- Q3 asks the participant to indicate their highest level of education

The third part of the survey covers questions that relate to the covariate of this study: attitude toward hearing health. In the fourth part of the survey, the participant is randomly assigned to one out of eight fictitious advertisements, followed by three manipulation check questions (about source credibility, source similarity, and message valence, respectively).

The fifth part comprises two questions relating to the mediator of this study: attitude toward the advertisement. The sixth part covers the questions on the first dependent variable of this study: attitude toward wearing hearing protection. The seventh and last part of the survey contains the questions on the second and last dependent variable: intention to wear hearing protection. A five-point Likert scale (1 = strongly disagree ; 5 = strongly agree) will be used for all the questions mentioned in this paragraph (= the main part of the study). After completing these questions, the survey is finished, and the participants will see the note: "Thank you for your participation. Your response has been recorded. If you have any questions or remarks, you may contact c.e.h.m.silven@student.utwente.nl"

How much time will each participant spend (mention the number of sessions/meetings in which they will participate and the time per session/meeting)?

It takes approximately 5 minutes per participant to complete the experimental survey.

C: BURDEN AND RISKS OF PARTICIPATION

27. Please provide a brief description of these burdens and/or risks and how you plan to minimize them:

The survey introduction will mention: "Your participation to is completely voluntary. Your responses are anonymous and will remain confidential. However, if you feel uncomfortable answering any of the questions, you may withdraw from the survey at any point. There are no foreseeable risks associated with this research or participation to this survey." That said, the participant has the right to refuse participation and withdraw from the survey at any point, without any negative repercussions and without the obligation to provide any explanation.

28. Can the participants benefit from the research and/or their participation in any way? If yes, please explain:

Yes, the participants may benefit from the research in the sense that they are informed about or reminded of the importance of maintaining their hearing health.

29. Will the study expose the researcher to any risks (e.g. when collecting data in potentially dangerous environments or through dangerous activities, when dealing with sensitive or distressing topics, or when working in a setting that may pose 'lone worker' risks)?

No

D. INFORMED CONSENT

30. Will you inform potential research participants (and/or their legal representative(s), in case of non-competent participants) about the aims, activities, burdens and risks of the research before they decide whether to take part in the research?

Yes

Briefly clarify how:

The introduction of the survey states the research purpose and goal and explains that participation is completely voluntary and that the research and participation do not bring forward any foreseeable risks. In addition, it states that all information is anonymous and kept confidential. Furthermore, it indicates that if the participant feels uncomfortable answering any of the questions, the participant may withdraw from the study at any point without any negative consequences nor explanation or justification. Finally, the text also features my UT e-mail address, which may be contacted for further questions about the survey, procedure, and research.

32. How will you obtain the voluntary, informed consent of the research participants (or their legal representatives in case of non-competent participants)?

Active online consent

33. Will you clearly inform research participants that they can withdraw from the research at any time without explanation/justification?

Yes

34. Are the research participants somehow dependent on or in a subordinate position to the researcher(s) (e.g. students or relatives)?

No

35. Will participants receive any rewards, incentives, or payments for participating in the research?

No

36. In the interest of transparency, it is a good practice to inform participants about what will happen after their participation is completed. How will you inform participants about what will happen after their participation is concluded?

- Participants will receive the researcher's contact details, so that they can contact the researcher if they have questions/would like to know more.
- Participants who indicate they are interested will receive a summary of the research results.

E. CONFIDENTIALITY AND ANONYMITY

37. Does the data collected contain personal identifiable information that can be traced back to specific individuals/organizations?

No

39. Will you make use of audio or video recording?

No

5. DATA MANAGEMENT

- I have read the UT Data policy.
- I am aware of my responsibilities for the proper handling of data, regarding working with personal data, storage of data, sharing and presentation/publication of data.

6. OTHER POTENTIAL ETHICAL ISSUES/CONFLICTS OF INTEREST

40. Do you anticipate any other ethical issues/conflicts of interest in your research project that have not been previously noted in this application? Please state any issues and explain how you propose to deal with them. Additionally, if known indicate the purpose your results have (i.e. the results are used for e.g. policy, management, strategic or societal purposes).

The findings of this research may be useful to social marketers who want to educate themselves on effective (or ineffective, depending on the results of this research) persuasion strategies for social marketing advertisements (= societal purposes). However, since my thesis project is an independent research project (i.e., not connected to a company or organization), these research results are not actively presented to social marketers.

7. ATTACHMENTS

-

8. COMMENTS

-

9. CONCLUSION

Status: Approved by commission