

The Moderating Role of Need for Cognition in Consumers' Responses to Ads with
Varied Claims

Hangyu Gu

A Thesis

at

John Molson School of Business

Presented in Partial Fulfillment of the Requirements

For the Degree of Master of Science in Administration (Marketing) at

Concordia University

Montreal, Quebec, Canada

March 2019

©Hangyu Gu

CONCORDIA UNIVERSITY

School of Graduate Studies

This is to certify that the thesis prepared

By: Hangyu Gu

Entitled: The Moderating Role of Need for Cognition in Consumers' Responses to Ads with
Varied Claims

and submitted in partial fulfillment of the requirements for the degree of

Master of Science in Administration (Marketing)

complies with the regulations of the University and meets the accepted standards
with respect to originality and quality.

Signed by the final examining committee:

_____ Denis Schweizer _____ Chair

_____ Michele Paulin _____ Examiner

_____ Jordan Le Bel _____ Examiner

_____ Michel Laroche _____ Supervisor

Approved by _____ Zeynep Arsel _____

Chair or Department of Graduate Program Director

_____ Jooseop Lim _____

Dean of Faculty

Date _____ 22.03.2018 _____

Abstract

The Moderating Role of Need for Cognition in Consumers' Responses to Ads with Varied Claims

Hangyu Gu

The research focuses on how need for cognition impacts the relationship between ad claim variations and consumer attitudinal and behavioral reactions. The ad claims vary, in this study, in ad format (direct vs. indirect comparative) and message framing (one vs. two sided). What has been investigated is the main and interaction effects of the two constructs that vary ads on consumers' responses under high and low need for cognition conditions. As most research that discusses ad formats' effects focuses on the differences between non comparative and comparative ones, this research can fill the gap by exploring how direct and indirect comparative ad formats together with message framing differ in affecting consumers' responses. Furthermore, the research also investigates how high and low need for cognition consumers process advertising information to make their evaluations by observing the mediating role of their information processing mode in need for cognition levels and attitude certainty, which also impacts their behavioral consequences such as purchase intentions.

The research findings show that message framing has main effects on participants' responses whereas ad format does not. There are no interaction effects of need for cognition and ad format/message framing on participants' responses, and information processing mode plays a very important role in their attitudinal and conative reactions. Its' importance is evidenced by the proposed mediation effect in which it acts a mediator and its relationship with attitude certainty and purchase intentions. These findings reinforce some past relevant studies. Some major managerial implications include a reminder of valuing how consumers process information for ad design and of considering some other factors (e.g. willingness to try a new brand) that may affect consumers' attitude more than need for cognition and ad format.

Keywords: need for cognition, ad format, message framing, information processing mode, attitude certainty, ad and brand attitude, purchase intention

Acknowledgements

I greatly appreciate the help from my supervisor, Michel Laroche, and Dan Petrovici at the University of Kent. They helped me evaluate the applicability of my thesis topic and provided constant assistance in giving me suggestions on how to improve on the hypotheses and model I proposed. In fact, they offered me much useful advice as my thesis writing was progressing from questionnaire design, data collection and analysis to the presentation of my thesis on paper. I especially want to thank Professor Petrovici, who made much dedication to how to improve my thesis regardless of the geographical distance and different time zone between us.

I treasure my experiences at Concordia. They have become a very unforgettable part in my life. I will continue to avail myself of what I have learned at JMSB for my future career and life!

Table of Contents

1. Introduction.....	1
2. Literature Review and Hypotheses.....	2
2.1. Need for cognition.....	2
2.2. Message framing and ad format.....	3
2.3. Information processing mode and attitude certainty	7
3. Research Methodology	10
3.1. Procedures.....	10
3.2. Measurement.....	11
4. Results.....	13
4.1. Pretests.....	13
4.1.1. The First Pretest	13
4.1.2. The Second Pretest	16
4.2. Main study	18
4.2.1. Participants and design	18
4.2.3. Manipulation Check	20
4.2.4. Main and interaction effects.....	21
4.2.5. Mediation Effects	26
4.2.6. Conclusion	29
5. Discussion	30
5.1. Theoretical implications	30
5.1.1. The moderating effect of NFC level and covariates.....	30
5.1.2. The effect of ad format	31
5.1.3. Message framing's main effects.....	32
5.1.4. The mediating role of information processing mode and attitude certainty ...	34
5.2. Managerial implications	34
6. Limitations and future directions	36
References.....	38
Appendices	44

Lists of Tables

Table 2.1: Overview of proposed hypotheses	9
Table 4.1: Trend of toothpaste brands.....	14
Table 4.2: The familiarity level of the most common toothpaste brands.....	15
Table 4.3: Toothpaste attribute importance level	16
Table 4.4: Sample Demography (N = 366)	20
Table 4.5: Tests of between-subjects effects (ANOVA, ad attitude)	22
Table 4.6: Tests of between-subjects effects (ANOVA, brand attitude)	23
Table 4.7: Tests of between-subjects effects (ANOVA, information processing mode)	24
Table 4.8: Tests of between-subjects effects (ANOVA, attitude certainty).....	25
Table 4.9: Tests of between-subjects effects (ANOVA, purchase intention)	26
Table 4.10: Summary of hypotheses testing.....	29
Table A.4.1: Tests of Between-Subjects Effects (ANCOVA, ad attitude)	44
Table A.4.2: Tests of Between-Subjects Effects (ANCOVA, brand attitude)	45
Table A.4.3: Tests of Between-Subjects Effects (ANCOVA, information processing mode).....	46
Table A.4.4: Tests of Between-Subjects Effects (ANCOVA, attitude certainty)	47
Table A.4.5: Tests of Between-Subjects Effects (ANCOVA, purchase intention)	48

Lists of Figures

Figure 2.1: Research Model	10
Figure 4.1: Indirect effect of information processing mode on NFC level and attitude certainty	27
Figure 4.2: Indirect effect of attitude certainty on information processing mode and purchase intention	28
Figure A.4.1: One-sided indirect comparative ad	55
Figure A.4.2: One-sided direct comparative ad	56
Figure A.4.3: Two-sided direct comparative ad	57
Figure A.4.4: Two-sided indirect comparative ad	58

1. Introduction

In this increasingly competitive marketplace, effective brand promotion and consumer engagement are becoming extremely important. Comparative appeals are commonly employed in advertising and are believed to have many strategic advantages over noncomparative appeals (Chang, 2007). Comparative advertising is defined as advertising that compares a sponsored brand with other (unnamed) brands (implicitly) or named brands (explicitly). However, most past research focuses on the comparison of the effectiveness of comparative and non-comparative advertising without much attention given to how direct and indirect comparative advertising may differ in affecting consumers' responses (Miniard et al., 2006). Furthermore, even if there are some studies that are directed toward comparative advertising that include both direct and indirect ones (Goodwin & Etgar, 1980; Pechmann & Ratneshwar, 1991), research on how these two types of comparative advertising impact consumers' responses in different conditions are still not comprehensive and well-grounded. Some studies have investigated some moderating effects on direct and indirect comparative advertising. For example, Jeon and Beatty (2002) study how direct and indirect advertising differ among individuals in different cultures (American and Korean). Shao, Bao, and Gray (2004) investigate the effects of direct vs. indirect comparative formats in low- and high-context cultures.

In addition, two-sided communications have become a topic of considerable importance to both practitioners and theoretical researchers (Crowley & Hoyer, 1994). Some research (Kamins & Assael, 1987; Pechmann, 1992) suggests the inclusion of negative information of a sponsored brand, which has been found to be more effective than one-sided communications that only present positive features of a brand. Furthermore, some researchers (Belch, 1981; Etgar & Goodwin, 1982) have focused on how message framing (one vs. two sided) and ad format (comparative vs. non comparative) together influence consumers' responses. However, seldom has any research been conducted on the effectiveness of message framing and two comparative ad formats (direct vs. indirect comparative). This research intends to explore how message framing and the two comparative ad formats impact consumers' reactions.

Additionally, the research on individual differences in consumers' responses to comparative and non-comparative advertising is quite limited (Polyorat, Alden & Alden, 2005), as well as similar research directed towards direct and indirect comparative advertising. To fill the gap of this limitation, Polyorat et al. (2005) study how need for cognition impacts consumers' responses to comparative and non-comparative advertising. This research extends this study by exploring how need for cognition moderates the effect of direct and indirect comparative advertising on consumers' responses. Moreover, only one study (Kao, 2011) investigates the moderating role of need for cognition (and different time pressure levels) on message framing's effect on consumers' affective and conative responses. Thus, how need for cognition impacts consumers' perception of one and two-sided advertising needs further investigation.

Besides the investigation into how need for cognition impacts the effects of message framing and ad formats, this research also focuses on how these variables further affect consumers' responses by providing evidences on the mediating role of information processing mode on the relationship between these variables and attitude certainty, which guides some behavioral consequences including purchase intention.

In conclusion, one main objective for my research is to investigate the moderation effect of need for cognition on consumers' affective and conative responses when they are exposed to ads with claims that vary in ad format and message framing. Another objective is to use information processing mode to further explain the process of how consumers' responses to the ads are formed.

2. Literature Review and Hypotheses

This section introduces the main concepts present in the hypotheses of the proposed model (e.g. Need for cognition, message framing and ad format) and discusses how each hypothesis is established based on previous literature.

2.1. Need for cognition

Petty and Cacioppo's (1981, 1986) proposed the elaboration likelihood model, in which within the central route individuals thoughtfully process issue-relevant information in a message. Attitudes formed thereafter accordingly depend on the quality of the message

arguments. On the contrary, individuals who lack motivation or ability to undertake issue-relevant thinking follow a peripheral route, whereby post-communication attitudes are based on message elements devoid of issue-relevant information. Individuals with low elaboration likelihood might be persuaded by attractive peripheral cues that elicit an emotional response (Zajonc, 1984). Jones et al. (2006) share the same argument. They reckon that with elaboration likelihood high individuals carefully consider the contents of a message and persuasion is a function of argument quality, whereas when confined to low elaboration likelihood individuals engage in less effortful processing and favor ads that are visually attractive.

The need for cognition personality variable was developed, in part, to account for individual differences in processing motivation in persuasion situations (Cacioppo & Petty, 1982). It has the potential to serve as an operationalization of the motivational component of elaboration likelihood model (Petty & Cacioppo, 1981). Cohen et al. (1955) define need for cognition as a need to structure relevant situations in meaningful and integrated ways. According to Cohen (1957), individuals with high rather than low need for cognition are more likely to organize, elaborate, and evaluate the information presented to them. Therefore, people with high need for cognition are more likely to experience the central route and value more pertinent information of an ad such as the quality of the arguments whereas those with low need for cognition follow a peripheral route to make evaluations and pay more attention to the peripheral cues of an ad.

2.2. Message framing and ad format

According to Kamins and Assael (1987), a one-sided message framing in advertising presents only claims that are supportive of the product or brand. A two-sided message framing, in addition to presenting positive claims on important attributes, downgrades or limits product or brand performance claims on attributes of minor significance to the consumer so as to establish credibility without deterring purchase (Kamins & Assael, 1987). Two-sided message framing can help intensify the cogency of the claims in an ad. Inoculation theory has been applied to predict that counterarguing (negatively valenced cognitive responses) can be reduced with two-sided persuasion (Kamins & Assael, 1987). McGuire (1961) describes a one-sided presentation as belaboring the obvious, giving the

receiver of the message little motivation to use the information seriously. What he seems to imply is that two-sided messages are more involving and “attention getting” than one-sided messages (Crowley & Hoyer, 1994). Thus, two-sided ads tend to present higher quality arguments than one-sided ads. As individuals with high NFC are more likely to experience the central route and pay more attention to pertinent information such as argument quality, this feature of two-sided ads aligns with their preferences. Similarly, one-sided ads are more likely to meet the interests of individuals with low NFC. Therefore, people with high NFC have more favorable attitudes toward two-sided ads whereas people with low NFC have more favorable attitudes toward one-sided ads.

Affective responses to advertising include individuals’ feelings (like or dislikes) about the advertisement (A_{ad}), and their feelings about the promoted brand (A_{br}). Mackenzie, Lutz, and Belch (1986) argue that feelings and attitudes toward the promoted brand are positively influenced by attitude toward the ad. Moreover, the conative component may be the most important because it shows whether different types of advertising affects consumers’ purchase behavior (Pechmann & Stewart, 1990). Consumer purchase intentions are a subjective inclination toward a product and can be an important index to predict consumer behavior (Fishbein & Ajzen, 1975). Brown and Stayman (1992) conducted a meta-analysis about the consequences of attitude toward the ad and found its substantially positive relationship with brand attitudes and purchase intentions. Thus, it can be proposed that

H1a: Individuals with high NFC have more favorable attitudes toward two-sided ads (the promoted brand and higher purchase intentions of the promoted brand) than those with low NFC.

H1b: Individuals with low NFC have more favorable attitudes toward one-sided ads (the promoted brand and higher purchase intentions of the promoted brand) than those with high NFC.

Besides the question of whether one- or two-sided message framing should be applied for brand promotion, marketers may also ponder on what ad format is a better way for promotion and need to search for some criteria for their choice. However, few researchers have studied direct versus indirect comparative ads (e.g. Snyder, 1992; Walker & Anderson, 1991). Direct comparative advertising refers to advertisers comparing the advertised brand

with competitors with their names explicitly shown (Wilkie & Farris, 1975), whereas indirect comparative advertising mentions competitors without naming them (Jackson et al., 1979). Previous research has distinguished direct and indirect comparative advertising. Sufficient processing of direct comparative advertising will result in the formation of relative mental impressions containing the specific reference point activated by the advertisement's comparison brand (Manning et al., 2001). On the contrary, because consumers' idiosyncratic activations are unlikely to parallel the uniformity induced by the explicit identification of the competitor in direct comparative advertising, many of the mental representations formed after exposure to indirect comparative advertising will not include the comparison brand in direct comparative advertising (Miniard et al., 2006). Direct comparative advertising thus may require more comparisons and reasoning than indirect comparative advertising. This difference may lead to individuals with high NFC level preferring direct comparative advertising which enables them to be more likely to include the comparative brand to make evaluations. Moreover, Snyder (1992) reckons that direct comparisons are processed with reference to an exemplar whereas indirect ones evoke a prototype. The exemplar is concrete and well recognized by the audience whereas the prototype is an idealized set of features, not very concrete and apparent (Kalro, Sivakumaran & Marathe, 2013). Kalro, Sivakumaran and Marathe (2013) find that people who expend more efforts by having analytical processing have more favorable evaluations on direct comparative advertising. As individuals with high need for cognition have the tendency to elaborate more on the given information, they may prefer direct comparative advertising that contains an exemplar concrete enough for them to make elaboration on. Specifically,

H2a: Individuals with high NFC level have more favorable attitudes toward direct comparative advertising (the promoted brand and higher purchase intentions) than those with low NFC level.

H2b: Individuals with low NFC level have more favorable attitudes toward indirect comparative advertising (the promoted brand and higher purchase intentions) than those with high NFC level.

In addition, many researchers have studied the interaction effect of ad format and message framing (one vs. two sided), but seldom have they investigated the effect of need for

cognition on this interaction. A few researchers (Chow & Luk, 2006) studied the impact of cognitive elaboration on comparative intensity. However, the comparative intensity they used depends on message framing (one vs. two sided), and direct comparative advertising without indirect comparative advertising included. In other words, by neglecting indirect comparative advertising, they just focussed on how cognitive elaboration impacts the interaction of ad format (direct comparative vs. non comparative) and message framing (one vs. two sided).

Combining the propositions about the respective effects of need for cognition on message appeals (one and two sided) and ad format (direct and indirect comparative) in terms of affective and conative responses (attitudes toward ad and brand, and purchase intentions), I can also posit the effects of need for cognition on the interaction of the two constructs. Specifically, consumers with high NFC levels have more favorable attitudes toward two-sided direct comparative advertising, while those with low NFC levels have more favorable attitudes toward one-sided indirect comparative advertising. This proposition is supported by the research by See, Petty, and Evans (2009). Their research shows that individual differences in NFC levels determine whether people are more motivated to process messages that are merely perceived to be simple or complex. They find that high NFC individuals are more motivated to process information they perceive to be complex, whereas low NFC individuals are more motivated when they perceive information to be simple. The mechanism behind this finding is the extent to which NFC levels match information complexity. Generally speaking, two-sided direct comparative advertising is obviously more complicated than one-sided indirect comparative advertising as the former presents more comparisons that require more attention and thinking. Therefore, two-sided comparative advertising matches high NFC levels individuals who have more tendency to elaborate on the information, which results in these individuals' more favorable attitudes toward these types of ads than those with low NFC levels. It can be proposed that

H3a: Individuals with high NFC levels have more favorable attitudes toward two-sided direct comparative advertising (the promoted brand and higher purchase intentions) than those with low NFC levels.

H3b: Individuals with low NFC levels have more favorable attitudes toward one-sided indirect comparative advertising (the promoted brand and higher purchase intentions) than those with high NFC levels.

2.3. Information processing mode, and attitude certainty

The study also explains how NFC levels moderate the impact of different types of ads by exploring the mediating role of information processing mode between NFC levels and attitude certainty. Attitude certainty is a dimension of attitude strength (Petty & Krosnick, 1995) that refers to a person's sense of conviction about his or her attitudes (Abelson, 1988), or the extent to which a person views his or her attitudes as correct (Gross, Holtz, & Miller, 1995). The more certain people are of their attitudes, the more these attitudes tend to guide behavior (Fazio & Zanna, 1978). Attitude certainty is a meta-cognition, as it is a secondary cognition (How certain am I of my attitudes?) about a primary cognition (my attitudes towards this product is positive) (Rucker, Petty, & Briñol, 2008). Thus, consumers who are more certain about their favorable attitudes towards a brand are very likely to have more intentions to purchase the product promoted in the ad. Similarly, those who are more certain about their unfavorable attitudes towards a brand are more likely not to have the intentions to buy the promoted product.

Processing mode describes the manner in which information is represented in working memory (MacInnis & Price, 1987). Imagery and analytical processing are qualitatively different modes of elaboration (Oliver, Robertson, & Mitchell, 1993). Imagery is based on a nonverbal, sensory representation of perceptual information in memory, as opposed to more semantic, reasoned processing (Childers, Houston, & Heckler, 1985). In contrast, the analytical mode of information processing is data driven, more detached from internal sensory experiences, and focused on verbal retrieval and encoding (MacInnis & Price 1987). Research by Cacioppo et al. (1986) shows that individuals with high NFC expend more cognitive efforts in evaluating messages. However, low NFC individuals typically prefer to avoid the effortful, cognitive work required to derive their attitudes based on the merits of arguments presented (Haugtvedt, Petty, & Cacioppo, 1992). This contrast implies that high NFC individuals elaborate more on the information presented to them than low NFC individuals. As a consequence, those with high NFC are more likely to use reasoning and process information in an analytical manner whereas those with low NFC tend to use more emotions, and expose themselves to an imagery mode to think. High NFC individuals

accordingly are also clearer about their attitudes than low NFC individuals. Thus, it can be argued that

H4: Information processing mode acts as a mediator between NFC levels and attitude certainty.

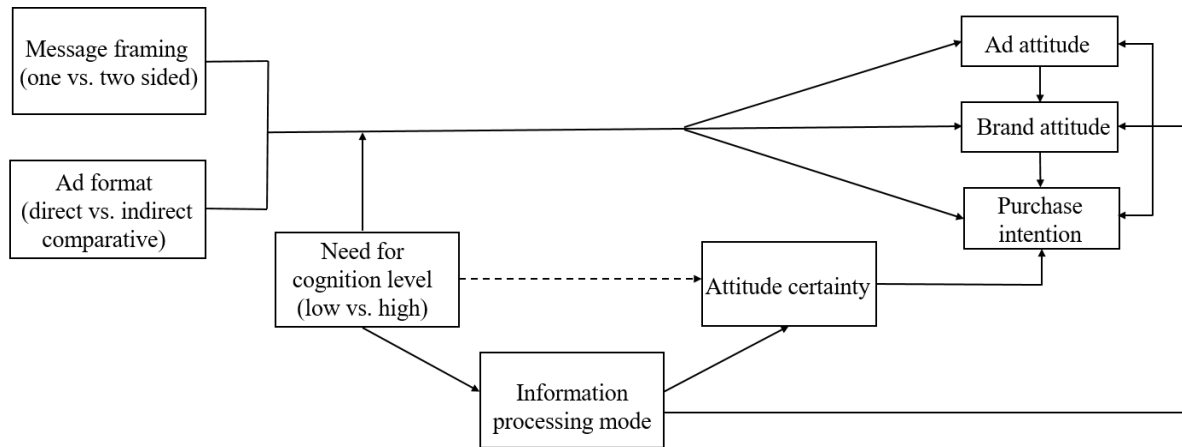
Moreover, two-sided direct comparative advertising presents more detailed comparison information that requires more cognitive elaboration. This feature may help individuals be more certain about their own evaluation of the promoted brand in a two-sided direct comparative ad, regardless of their NFC level being low or high. Low NFC individuals tend to have an imagery mode to think, and their information processing mode more aligns with one-sided indirect comparative advertising that does not require much elaboration to understand. In conclusion, the different information processing mode between individuals' levels of need for cognition accounts for how their attitudes toward the promoted brand in different types of ads (e.g. two-sided direct comparative vs. one-sided indirect comparative) differ. It is proposed that

H5: Information processing mode acts as a mediator between the interaction of message framing/ad format by NFC levels, and attitude certainty.

Table 2.1: Overview of proposed hypotheses

overview	hypotheses type	description
moderating effect of NFC	moderating effect of NFC on message framing	H1a: Individuals with high NFC have more favorable attitudes toward <i>two-sided ads</i> (the promoted brand and higher purchase intentions of the promoted brand) than those with low NFC.
		H1b: Individuals with low NFC have more favorable attitudes toward <i>one-sided ads</i> (the promoted brand and higher purchase intentions of the promoted brand) than those with high NFC.
	moderating effect of NFC on ad format	H2a: Individuals with high NFC levels have more favorable attitudes toward <i>direct comparative advertising</i> (the promoted brand and higher purchase intentions) than those with low NFC levels.
		H2b: Individuals with low NFC levels have more favorable attitudes toward <i>indirect comparative advertising</i> (the promoted brand and higher purchase intentions) than those with high NFC levels.
	moderating effect of NFC on message framing and ad format	H3a: Individuals with high NFC levels have more favorable attitudes toward <i>two-sided direct comparative advertising</i> (the promoted brand and higher purchase intentions) than those with low NFC levels.
		H3b: Individuals with low NFC levels have more favorable attitudes toward <i>one-sided indirect comparative advertising</i> (the promoted brand and higher purchase intentions) than those with high NFC levels.
mediating effect of information processing mode	mediating effect of information processing mode (NFC)	H4: Information processing mode acts as a mediator between <i>NFC levels</i> and attitude certainty.
	mediating effect of information processing mode (interaction of NFC and message framing/ad format)	H5: Information processing mode acts as a mediator between <i>the interaction of message framing/ad format by NFC level</i> , and attitude certainty.

Figure 2.1: Research Model



3. Research Methodology

A 2*2*2 between-subjects design was used to test the proposed hypotheses with ad format (direct or indirect comparative), message framing (one or two sided) and need for cognition level (low or high). A new fictitious toothpaste brand called “VIALA” was created for the design of test ads. The fictitious brand was used to avoid possible confounding effects due to prior familiarity or attitudes toward the promoted brand (Belch, 1981). Two pretests (the first one for the design of the test ads, and the second one used to test the effectiveness and appropriateness of the test ads) and a main test (to test the research hypotheses) were conducted.

3.1. Procedures

All questionnaires were designed on Qualtrics (1 questionnaire for the first pretest, 4 varying in test ad images for the second pretest, and another 4 varying in test ad images for the main test). All respondents who resided either in Canada or the United States without any other demographic restrictions were recruited online on Amazon Mechanical Turk. They randomly answered the questions in the questionnaires, the link to which was posted on this platform.

In the first pretest, participants first needed to read an information and consent form and were asked some demographic questions (gender, age, race, and education levels). They then were asked some questions related to toothpaste brands and common toothpaste functions/attributes.

The results in the first pretest determine what information should be included for the design of the test ads. Four test ads were accordingly designed (one-sided direct/indirect comparative, two-sided direct/indirect comparative ads). Different participants were recruited and asked to observe one of the four test ads and then answer some questions about their perceptions of the ad. Finally, new participants were involved in the main test. After they read the consent form and answered some demographic questions, they were asked to answer some need for cognition questions. They then were given one of the four test ads that were used in the second pretest and following it they answered some questions related to manipulation check, ad and brand evaluation, and covariates.

3.2. Measurement

In this research, all the scales in the model are drawn from previous studies.

The need for cognition scale used in this research is the 10-item version developed by Chiesi et al. (2018), originally from the 18-item need for cognition scale (Cacioppo, Petty & Kao, 1984), which is the most commonly used version that is applied to measure need for cognition in previous studies. The reason for using the 10-item version in this study is that the most common version includes 18 questions (many of them are quite long) and thus many participants online are very likely not to have the motivation to read carefully and answer genuinely. In previous studies, mostly researchers recruited some participants and asked them to answer questions using the 18 items on the scene. On the contrary, the data in this research is collected online, and many online respondents may be unwilling to dedicate time and effort to answering the questions as much as those recruited on the scene. Therefore, the 10-item need for cognition scale is more suitable in this research. The scale is measured on 5-point scale, ranging from 1 “extremely unlike me” to 5 “extremely like me”.

The scales for ad and brand attitudes are adapted from the study by Etgar and Goodwin (1982) with 9 and 4 items respectively. As to purchase intentions, the 4 items are

expanded from the study by Yagci, Biswas, and Dutta (2009). The three variables are measured on 7- point scale (from 1 “extremely disagree” to 7 “extremely agree”).

The 3 items used for information processing mode, also measured on 7-point scale (from 1 “extremely disagree” to 7 “extremely agree”), are those that are used to check whether analytical information processing manipulation is effective in the study by Thompson and Hamilton (2006). The reason the items for imagery information processing mode are excluded is that information processing mode is a dependent variable in this study. If participants score higher in the items in the analytical information processing mode, they have more analytical information processing. Otherwise, they have less analytical information processing (in other words, more imagery information processing). Therefore, including items that are used for analytical and imagery processing manipulation in that study are repetitive, and using only the items for analytical manipulation are enough in this study.

The two items to measure attitude certainty are adapted from the article by Rucker Petty and Briñol (2008), including “How certain are you of your attitude toward the promoted brand in the ad” and “How convinced are you that your attitude toward the promoted brand in the ad is correct” on 7-point scale (from 1 “not certain at all” to 7 “extremely certain”).

The manipulation of message framing (one vs. two sided) and ad format (direct vs. indirect comparative) is referenced from the study by Belch (1981) on a 7-point scale. In the manipulation check, participants were also asked “how credible is the company of the promoted brand” (from 1 “not credible at all” to 7 “extremely credible”), and “how biased the ad is” (from 1 “not biased at all” to 7 “extremely biased” on a 7-point Likert scale. In the second pretest, they were asked about their attitudes toward the ad to know how acceptable and appropriate the ad design was (Raju, Unnava & Montgomery, 2009).

In terms of the covariates, three items that measure familiarity of ad format (Roehm, 2001) are used in the study for participants’ degree of familiarity with direct and indirect comparative advertising. Three items to measure purchase decision involvement are applied from the two studies of Mittal (1989) and Herz & Diamantopoulos (2013). Participants were also simply asked “how much they like the leading toothpaste brand Crest” and “indicate their willingness to try a new toothpaste brand” on a 7-point Likert scale to measure their preference for Crest and how much they are willing to try a new toothpaste brand.

4. Results

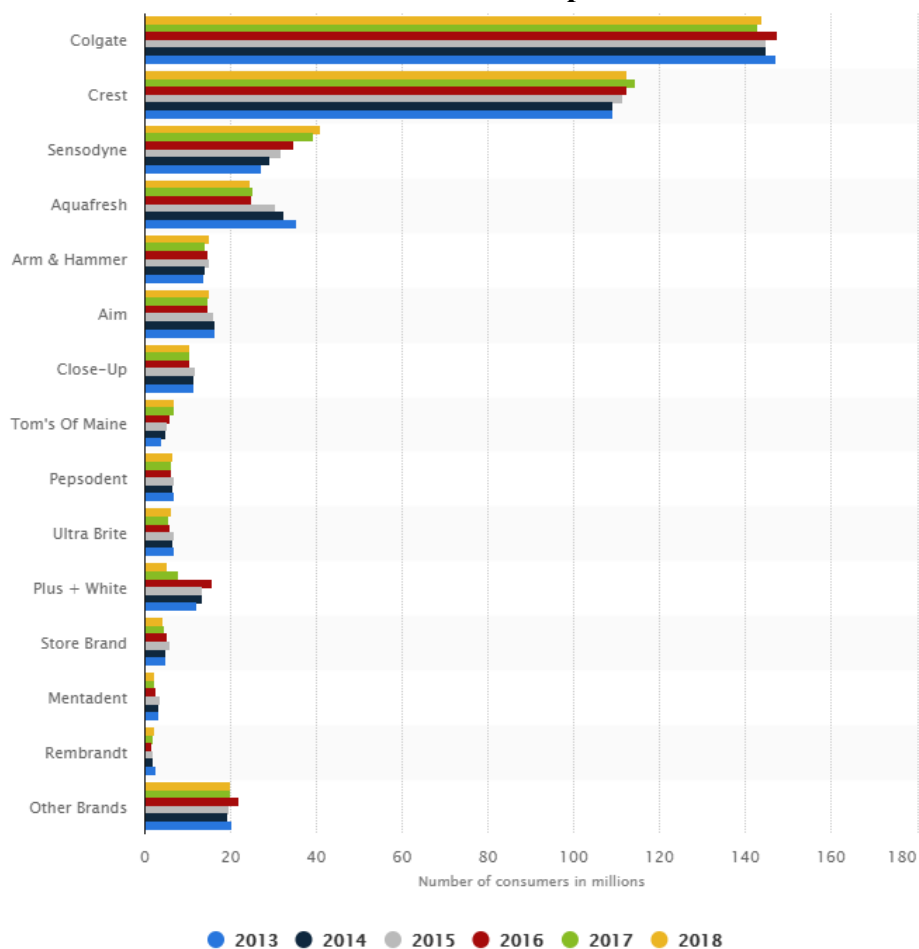
This section includes the analysis results in the two pretests and the findings of the main study. Some main and interaction effects are discussed based on 5 dependent variables for hypotheses testing. The proposed mediating effects are then discussed. Furthermore, following the testing of the proposed mediating effects are the two that were not proposed previously. Finally, a summary of hypotheses testing is displayed.

4.1. Pretests

4.1.1. The first pretest

The first pretest was used to identify the leader in the toothpaste market and the toothpaste attributes against the fictitious toothpaste brand for the design of direct comparative and two-sided ads respectively.

Table 4.1: Trends of toothpaste brands



Statistics from the official Statista website

(<https://www.statista.com/statistics/319740/brands-of-toothpaste-in-the-us-trend/>) (Table 4.1)

show that in the 5 years from 2013 to 2018, Colgate is the toothpaste brand most used by U.S. population, followed by Crest. Both brands are market leaders since they do not differ much in the number of consumers. Eighty respondents (51.3% females, 77.5% aged 17-55) who resided either in Canada or the U.S. were involved in the first pretest and completed the survey. They were asked about their familiarity with some most common toothpaste brands in North America listed in the survey (Colgate, Aquafresh, ARM & Hammer, etc.) on a 5-point Likert scale (from 1 “not familiar at all” to 5 “extremely familiar”). Table 4.2 shows that Crest and Colgate are the toothpaste brands those participants were most familiar with means of 4.56 and 4.49 respectively. They were further asked about which toothpaste brands they bought the most frequently. Results show that 43.8% chose Crest and 31.3% Colgate. Comparative advertising often is used for new brands to compare them with market leaders

(Belch, 1981). Thus, based on the actual statistics and the survey, Crest was finally selected to be used to compare with the promoted toothpaste brand for the design of direct comparative advertising.

A typical two-sided appeal includes positive claims on important attributes and downgrades claims of minor significance to a consumer to establish credibility without deterring purchase (Kamins & Assael, 1987). Therefore, whether attributes are included in two-sided ads as positive depends on the order of their importance to consumers. To determine the degree of importance of common toothpaste attributes, the first pretest was also comprised of one question that asked how important some typical toothpaste attributes were to consumers on a 5-point Likert scale (from 1 “not important at all” to 5 “extremely important”). Table 4.3 shows “flavor” and “repair sensitive teeth against sensitivity” were the two least important attributes to participants based on the means (3.06 and 3.24 respectively). More than 30 percent of participants chose either “not important at all” or “slightly important” for these two attributes. The two attributes were used as negative ones against the promoted brand in the test ads. Six attributes (means range from around 4 to 4.50) were included as positive. Finally, due to “price” and “restore teeth to whiteness” distributing relatively equally across the 5 point with high variance and the effects of the number of claims (Golden & Alpert, 1987), these two attributes were excluded in the test ads.

Table 4.2: The familiarity levels of the most common toothpaste brands

Toothpaste Brand	Minimum	Maximum	Mean	Std Deviation	Variance	Count
Crest	3	5	4.56	0.65	0.42	80
Colgate	3	5	4.49	0.69	0.47	80
Aquafresh	1	5	3.91	1.07	1.15	80
Sensodyne	1	5	3.56	1.23	1.52	80
Oral-B	1	5	3.46	1.26	1.6	80
Arm & Hammer	1	5	3.38	1.16	1.33	80
Euthymol	1	3	1.09	0.32	0.1	80

Table 4.3: Toothpaste attribute importance levels

Toothpaste Attributes	Minimum	Maximum	Mean	Std Deviation	Variance	Count
flavour	1	5	3.06	1.08	1.16	80
repair sensitive teeth	1	5	3.24	1.27	1.61	80
whitening teeth	1	5	3.33	1.13	1.27	80
price	1	5	3.71	1.21	1.45	80
freshen breath	1	5	3.98	0.99	0.97	80
kill harmful germs	1	5	4.2	1.03	1.06	80
remove tartar	2	5	4.25	0.84	0.71	80
protect enamel	1	5	4.25	0.89	0.79	80
protect gum	1	5	4.34	0.91	0.82	80
prevent cavity	2	5	4.58	0.7	0.49	80

4.1.2. The second pretest

Based on the data collected from the first pretest, four test ads were accordingly designed (one-sided direct comparative, one-sided indirect comparative, two-sided direct comparative, and two-sided indirect comparative ads) (the four test ad images are reproduced in the appendices). The fictitious toothpaste brand is named VIAILA. Its company introduces VIAILA DOUBLE GUARD toothpaste to the toothpaste market in North America, featuring across the four types of the test ads its extraordinary effectiveness of gum and enamel protection along with other four attributes that ranked high in the order of importance to respondents in the first pretest. Print ads are introduced to promote the toothpaste for its potential customers in this continent. In the direct comparative condition where this fictitious brand is compared with Crest along three attributes (repair sensitive teeth, protect gum and enamel), the features of two-sided ones are obtained by disclaiming “repair sensitive teeth” (the promoted brand does not repair so much as Crest) and “flavor” (the promoted brand has a bitter flavor) whereas one-sided ads are manipulated by claiming that all the attributes included are superior by considering the two attributes that are negative in the two-sided ads

positive (the promoted brand repairs sensitive teeth more than Crest, and it has a refreshing flavor). Similar manipulations are applied to indirect comparative settings except that the fictitious brand VIAILA competes with other toothpaste brands rather than the market leader Crest.

The purpose of the second pretest is to examine whether the design of the test ads is proper for the main test. The effective use of a two-sided message requires that the product attributes for which superiority is disclaimed actually is perceived as inferior by the respondents (Belch, 1981). To examine whether participants perceived two-sided ads as two sided and one-sided ones as one sided, they were asked about their evaluations with three relevant statements on a 7-point Likert scale (from 1 “strongly disagree to 7 “strongly agree”) following their exposure to the test ads. Around 160 participants completed the survey for this pretest (around 40 in each test ad, 46.6% females, 89.6% aged 17-55). In the first statement “The toothpaste ad you have just seen shows both positive and negative information about VIAILA DOUBLE GUARD toothpaste”, the univariate test indicates that there is a main effect of message framing on the perception of whether the test ads show both negative and positive information, $F(1, 159) = 286.68, p < .001$ ($M_{\text{one-sided}} = 1.87, M_{\text{two-sided}} = 5.84$). There is no main effect of ad format in this statement, $F(1, 159) = .105, p = .746$. It means the manipulation is successful. Participants who read the two-sided ads agreed significantly more that the test ads showed both positive and negative information than those who read the one-sided ads. Similar results also appear in the second statement “VIAILA DOUBLE GUARD toothpaste has much stronger ability to repair sensitive teeth than Crest (direct comparative) or other toothpaste brands (indirect comparative)”, $F(1, 159) = 128.93, p < .001$ ($M_{\text{one-sided}} = 5.77, M_{\text{two-sided}} = 2.89$), and in the third statement “VIAILA DOUBLE GUARD toothpaste has a very agreeable flavor”, $F(1, 159) = 182.74, p < .001$ ($M_{\text{one-sided}} = 5.84, M_{\text{two-sided}} = 2.55$). These results for the two statements further show that the manipulation of message framing is effective, as they imply that respondents managed to clearly recall the two minor attributes that were used as disclaimers against the promoted toothpaste brand in the test ads by perceiving the disclaimed attributes as more inferior in two-sided ads than in one-sided ads, which claim the two attributes as positive (the promoted brand’s ability to repair sensitive teeth, and refreshing flavor). The results of the second statement also indicate that respondents could also remember how the negative attribute,

“repair sensitive teeth”, was applied for comparison (with Crest or other toothpaste brands), suggesting that the manipulation of direct and indirect setting in the test ads was successful.

Ad bias

Respondents were asked about how biased the ad was. Message framing has a main effect on ad bias, $F(1, 159) = 102.57, p < .001$. They perceived two-sided ads less biased than one-sided ones ($M_{\text{two-sided}} = 3.2, M_{\text{one-sided}} = 5.84$).

Company credibility

Respondents were also asked about how credible the company of the promoted toothpaste brand was. Message framing and ad format both have main effects on their perception of company credibility, $F(1, 159) = 6.06, p = .015$ and $F(1, 159) = 4.42, p = 0.037$ respectively. They thought the company was more credible when shown two-sided ads ($M_{\text{two-sided}} = 5.2, M_{\text{one-sided}} = 4.7$), or indirect comparative ads ($M_{\text{indirect}} = 5.16, M_{\text{direct}} = 4.73$).

Ad attitudes

They were also asked to evaluate the test ads on a 7-point Likert scale with 4 items (Bad to Good, Uninformative to Informative, Difficult to understand to Easy to understand, Dislike to Like). The 4 items were averaged to 1 item ($\alpha = .83$). Ad format and message framing both have main effects on respondents' attitudes toward the test ads, $F(1, 159) = 7.19, p = .008$, and $F(1, 159) = 5.32, p = .022$ respectively. Specifically, respondents had more favorable ad attitudes toward indirect comparative advertising ($M = 5.72$) than direct comparative advertising ($M = 5.33$). They also preferred one ($M = 5.7$) to two-sided ($M = 5.35$) advertising. The means of ad attitudes across the 4 types of ads are all above 5, indicating generally good reviews of the ad design.

4.2. Main study

4.2.1. Participants and design

Based on the four types of test ads, four questionnaires with different ad images were designed. The data for the main study were collected on MTurk. Four hundred and five

respondents completed the survey with around 100 involved in each of the four questionnaires. They were first asked some demographic questions such as age, gender, race, and education levels. A shortened version of the need for cognition scale that included 10 items developed by Chiesi et al. (2018) was used to test respondents' need for cognition levels. Afterwards, an image of the print ad was shown and they were asked to observe it for at least 10 seconds and make evaluations with multiple questions.

Respondents were median split based on their scores on need for cognition. The median score of need for cognition is 37 with 208 participants low (10 to 37) and 198 high in need for cognition (38 to 50). In order to distinguish between high and low levels of need for cognition, those who scored in the middle from 36 to 38 were eliminated for further analysis. As a result, three hundred and sixty-six participants' responses were retained (183 low with scores from 10 to 35, and 183 high with scores from 39 to 50). The 10 items that measure need for cognition from the 366 sample are also highly correlated ($\alpha = .96$). Furthermore, a *t*-test shows that after the median split there is a statistically significant difference between low and high need for cognition ($t(364) = 31.92, p < .001, M_{\text{high}} = 43.6, M_{\text{low}} = 24.5$).

Table 4.4 presents the demographic summary of the 366 participants.

Table 4.4: Sample demographics (N = 366)

		frequency	percentage
gender	Male	205	56.01%
	Female	161	43.99%
age	17-25	12	3.28%
	26-35	148	40.44%
	36-45	113	30.87%
	46-55	54	14.75%
	> 55	39	10.66%
race	Native American	4	1.09%
	Asian	24	6.56%
	African American/Alack	32	8.74%
	Caucasian/White	277	75.68%
	Hispanic/Latino	16	4.37%
	Pacific Islander	1	0.27%
	Multiracial	12	3.28%
education level	Attended high school but did not finish	4	1.09%
	High school diploma	52	14.21%
	Attended college but did not finish	65	17.76%
	Vocational or technical degree or certificate	10	2.73%
	Associate's degree	44	12.02%
	Bachelor's degree	149	40.71%
	Master's degree	37	10.11%
	Doctorate degree	5	1.37%

4.2.2. Scale reliability

The value of Cronbach's α for all the variables in the model is greater than 0.8, which indicates good scale reliability except for information processing mode (0.63). The second item "I evaluated the toothpaste feature by feature rather than as a whole" does not highly correlate with the first ($r = .346$) or second ($r = .273$) item compared with the correlation between the first and the third item ($r = .619$). Thus, the second item accounts for the poor scale reliability. However, Sufjan (1985) states that in analytical processing mode products are evaluated on an attribute by attribute basis, which aligns with what is stated in the second item. Therefore, the second item that measures this variable is retained.

4.2.3. Manipulation check

The manipulation of message framing is quite effective. The same three statements measured on a 7-point Likert scale in the second pretest were included in the main test to examine the effectiveness of the message framing manipulation. Respondents who were exposed to two-sided ads agreed more that the ad showed both positive and negative

information than those who were shown one-sided ads, $F(1, 358) = 749.98, p < .001$ ($M_{\text{two-sided}} = 6.18, M_{\text{one-sided}} = 1.86$). Respondents who observed two-sided ads also disagreed more strongly on the two statements about the two attributes that were disclaimed in two-sided ads than those who saw one-sided ads (can repair sensitive teeth: $F(1, 358) = 327.56, p < .001, M_{\text{two-sided}} = 3.37, M_{\text{one-sided}} = 5.5$; has an agreeable flavor: $F(1, 358) = 442.79, p < .001, M_{\text{two-sided}} = 2.17, M_{\text{one-sided}} = 5.67$).

ANOVA results also show that message framing has a main effect on ad bias, $F(1, 358) = 188.86, p < .001$, and company credibility, $F(1, 358) = 24.88, p < .001$. Specifically, respondents found more ad bias in one than two sided ads ($M_{\text{one-sided}} = 5.65, M_{\text{two-sided}} = 3.17$). They also think the company is less credible when shown one than two sided ads ($M_{\text{one-sided}} = 4.6, M_{\text{two-sided}} = 5.52$).

4.2.4. Main and interaction effects

ANOVA and ANCOVA were used to examine how different types of ads affected the affective and conative responses of respondents with high or low NFC levels.

4.2.4.1. Ad attitudes

As is shown in Table 4.5, there are no main effects of message framing, ad format and NFC levels, or interaction effects of the three variables, on ad attitudes (all p 's $> .05$). Thus, H1, H2 and H3 are not supported in terms of ad attitudes.

Furthermore, ANCOVA (including five covariates: familiarity with direct comparative advertising, familiarity with indirect comparative advertising, purchase decision involvement, preference of Crest and willingness to try a new toothpaste brand) shows that except for the two familiarity variables (p 's $> .05$) the other three covariates are all statistically significant (p 's $\leq .001$).

Table 4.5: Tests of between-subjects effects (ANOVA, ad attitudes)

Tests of Between-Subjects Effects						
Dependent Variable: ad attitude						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	9.469 ^a	7	1.353	1.506	0.164	0.029
Intercept	11298.777	1	11298.777	12580.112	0.000	0.972
ad_format	0.309	1	0.309	0.344	0.558	0.001
message_framing	1.574	1	1.574	1.752	0.186	0.005
NFC_level	1.957	1	1.957	2.179	0.141	0.006
ad_format * message_framing	0.031	1	0.031	0.034	0.853	0.000
ad_format * NFC_level	0.489	1	0.489	0.545	0.461	0.002
message_framing * NFC_level	2.762	1	2.762	3.075	0.080	0.009
ad_format * message_framing * NFC_level	2.595	1	2.595	2.889	0.090	0.008
Error	321.536	358	0.898			
Total	11644.593	366				
Corrected Total	331.006	365				

a. R Squared = .029 (Adjusted R Squared = .010)

4.2.4.2. Brand attitudes

Table 4.6 shows that message framing has a main effect on brand attitude ($p < .001$). Specifically, respondents have more favorable brand attitudes toward one than two sided ads, $F(1, 358) = 47.73$, $M_{\text{two-sided}} = 4.46$, $M_{\text{one-sided}} = 5.4$. Therefore, H1, H2 and H3 are not supported in terms of brand attitudes.

Additionally, there is a three-way interaction effect on respondents' attitudes toward this promoted toothpaste brand, $F(1, 358) = 6.43$, $p = .012$. Those with high NFC prefer direct one-sided ads to indirect two-sided ones ($p < .001$), whereas there is no statistically significant difference between direct one and indirect two-sided ads among low NFC respondents ($p = .229$). Furthermore, respondents prefer indirect one to direct two ads regardless of the level of NFC ($p_{\text{high}} = .017$, $p_{\text{low}} = .013$). ANCOVA was then used (including the same five covariates). The main effect of message framing and the three-way interaction effect is still statistically significant ($p_{\text{main}} < .001$, $p_{\text{interaction}} = .04$). However, the p value of the two covariates (willingness to try new toothpaste brand and preference of Crest) are both smaller than .001, with that of the other three ones greater than .1.

Table 4.6: Tests of between-subjects effects (ANOVA, brand attitudes)

Tests of Between-Subjects Effects						
Dependent Variable: brand attitude						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	94.620 ^a	7	13.517	7.971	0.000	0.135
Intercept	8876.385	1	8876.385	5234.653	0.000	0.936
ad_format	0.003	1	0.003	0.002	0.964	0.000
message_framing	80.934	1	80.934	47.729	0.000	0.118
NFC_level	0.000	1	0.000	0.000	0.999	0.000
ad_format * message_framing	1.061	1	1.061	0.626	0.429	0.002
ad_format * NFC_level	1.912	1	1.912	1.127	0.289	0.003
message_framing * NFC_level	1.625	1	1.625	0.958	0.328	0.003
ad_format * message_framing * NFC_level	10.910	1	10.910	6.434	0.012	0.018
Error	607.059	358	1.696			
Total	9591.063	366				
Corrected Total	701.680	365				

a. R Squared = .135 (Adjusted R Squared = .118)

4.2.4.3. Information processing mode

From Table 4.7, NFC has a main effect on information processing mode, $F(1, 358) = 33.23, p < .001$. Specifically, respondents with high NFC have more tendency to process the ad information in an analytical way than those with low NFC ($M_{\text{high}} = 6.1, M_{\text{low}} = 5.55$). However, there are no other main or interaction effects (all p 's $> .05$). After adding the five covariates, NFC's main effect on information processing is still statistically significant, $F(1, 353) = 20.35, p < .001, M^{\text{a}}_{\text{high}} = 6.03, M^{\text{a}}_{\text{low}} = 5.61$. Except for familiarity of direct comparative advertising ($p = .507$), all other covariates are statistically significant (p 's $\leq .05$).

Table 4.7: Tests of between-subjects effects (ANOVA, information processing mode)

Tests of Between-Subjects Effects						
Dependent Variable: information processing mode						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	31.966 ^a	7	4.567	5.403	0.000	0.096
Intercept	12388.919	1	12388.919	14657.399	0.000	0.976
ad_format	0.876	1	0.876	1.036	0.309	0.003
message_framing	0.921	1	0.921	1.090	0.297	0.003
NFC_level	28.087	1	28.087	33.230	0.000	0.085
ad_format * message_framing	0.000	1	0.000	0.000	0.997	0.000
ad_format * NFC_level	0.124	1	0.124	0.146	0.702	0.000
message_framing * NFC_level	0.033	1	0.033	0.039	0.843	0.000
ad_format * message_framing * NFC_level	2.225	1	2.225	2.633	0.106	0.007
Error	302.593	358	0.845			
Total	12738.222	366				
Corrected Total	334.560	365				

a. R Squared = .096 (Adjusted R Squared = .078)

4.2.4.4. Attitude certainty

In terms of attitude certainty, Table 4.8 shows that groups that differ in either message framing or NFC are statistically different with p values equivalent to .014 and .019 respectively. There are no other main or interaction effects (p 's > .1). Respondents with high NFC were more certain about their attitudes than those with low NFC, $F(1, 358) = 5.58$, $p = .019$, $M_{\text{high}} = 5.39$, $M_{\text{low}} = 5.07$. And those who were shown two sided ads felt more certain about their attitudes than those who were asked to observe one-sided ads, $F(1, 358) = 6.13$, $p = .014$, $M_{\text{two}} = 5.4$, $M_{\text{one}} = 5.06$. However, after adding the five covariates in the model, the main effect of NFC becomes only marginally statistically significant ($p = .07$) although message framing's main effect on attitude certainty still holds ($F(1, 353) = 7.44$, $p = .007$, $M^{\text{a}}_{\text{two}} = 5.41$, $M^{\text{a}}_{\text{one}} = 5.05$). In addition, three covariates (preference of Crest, willingness to try a new toothpaste brand and purchase decision involvement) are all statistically significant ($p < .05$). The other two covariates are nonsignificant ($p > .25$).

Table 4.8: Tests of between-subjects effects (ANOVA, attitude certainty)

Tests of Between-Subjects Effects						
Dependent Variable: attitude certainty						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	28.821 ^a	7	4.117	2.394	0.021	0.045
Intercept	9988.263	1	9988.263	5806.685	0.000	0.942
ad_format	1.806	1	1.806	1.050	0.306	0.003
message_framing	10.536	1	10.536	6.125	0.014	0.017
NFC_level	9.593	1	9.593	5.577	0.019	0.015
ad_format * message_framing	0.030	1	0.030	0.017	0.896	0.000
ad_format * NFC_level	1.736	1	1.736	1.009	0.316	0.003
message_framing * NFC_level	0.825	1	0.825	0.480	0.489	0.001
ad_format * message_framing * NFC_level	4.281	1	4.281	2.489	0.116	0.007
Error	615.807	358	1.720			
Total	10633.000	366				
Corrected Total	644.628	365				

a. R Squared = .045 (Adjusted R Squared = .026)

4.2.4.5. Purchase intentions

Table 4.9 shows that only message framing has a main effect on purchase intentions ($F(1, 358) = 24.15, p < .001$, other p 's $> .05$). H1, H2 and H3 are not supported in terms of purchase intentions. Respondents had higher purchase intentions when exposed to one than two sided ads ($M_{\text{one}} = 4.34, M_{\text{two}} = 3.46$). Its main effect is still statistically significant following the use of ANCOVA ($F(1, 353) = 30.67, p < .001, M^{\text{aone}} = 4.33, M^{\text{atwo}} = 3.46$). The three covariates that are statistically significant in attitude certainty are significant in purchase intentions ($p \leq .001$). The other two covariates are not statistically significant ($p > .15$).

Table 4.9: Tests of between-subjects effects (ANOVA, purchase intentions)

Tests of Between-Subjects Effects						
Dependent Variable: purchase intention						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	97.610 ^a	7	13.944	4.765	0.000	0.085
Intercept	5549.414	1	5549.414	1896.310	0.000	0.841
ad_format	2.966	1	2.966	1.013	0.315	0.003
message_framing	70.684	1	70.684	24.154	0.000	0.063
NFC_level	0.106	1	0.106	0.036	0.849	0.000
ad_format *						
message_framing	5.710	1	5.710	1.951	0.163	0.005
ad_format * NFC_level	1.581	1	1.581	0.540	0.463	0.002
message_framing *						
NFC_level	8.268	1	8.268	2.825	0.094	0.008
ad_format *						
message_framing *						
NFC_level	9.510	1	9.510	3.250	0.072	0.009
Error	1047.661	358	2.926			
Total	6707.063	366				
Corrected Total	1145.271	365				

a. R Squared = .085 (Adjusted R Squared = .067)

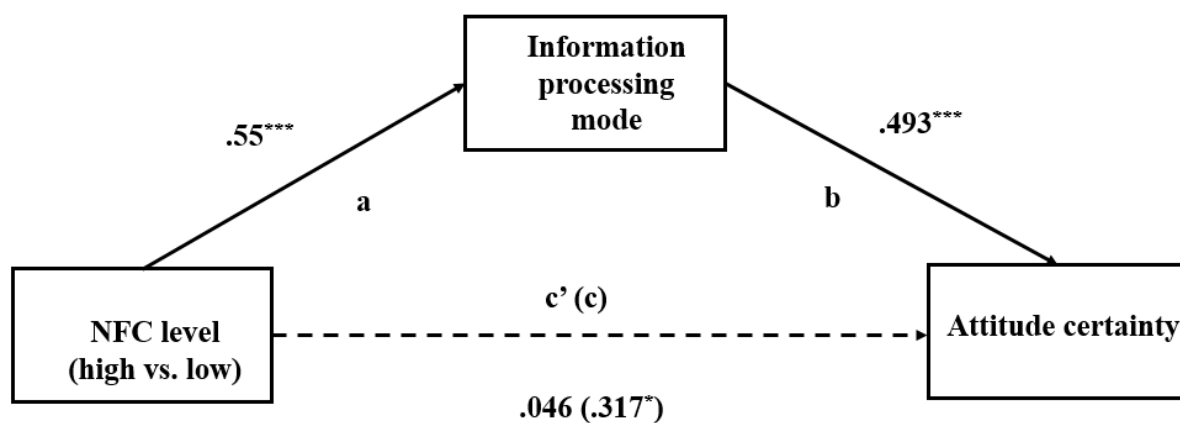
4.2.5. Mediation effects

The mediation effect of information processing mode on the relationship between NFC and attitude certainty

Multiple regression analyses were conducted to assess each component of the proposed mediation model. First, it was found that NFC level was positively associated with attitude certainty ($B = .317, t(364) = 2.3, p = .022$). It was also found that high NFC levels (as opposed to low NFC levels) were positively related to information processing mode ($B = .55, t(364) = 5.73, p < .001$). Lastly, results indicated that the mediator, information processing, was positively associated with attitude certainty ($B = .493, t(364) = 6.95, p < .001$). Because both the a-path and b-path were significant, mediation analyses were tested using the bootstrapping method with bias-corrected confidence estimated (MacKinnon,

Lockwood, & Williams, 2004; Preacher & Hayes, 2004). In the present study, the 95% confidence interval of the indirect effect was obtained with 5000 bootstrap resamples (Preacher & Hayes, 2008). Results of the mediation analysis confirmed the mediating role of information processing mode in the relation between NFC levels and attitude certainty (95% CI = .167 to .426, zero fell outside of the provided range). In addition, results indicated that the direct effect of NFC levels on attitude certainty became nonsignificant ($B = .046$, $t(364) = .336$, $p = .737$) when controlling for analytical information processing, thus suggesting full mediation. Figure 2 displays the results.

Figure 4.1: Indirect effect of information processing mode on NFC level and attitude certainty



Note: * $p < .05$, ** $p < .01$, *** $p < .001$

The mediating role of attitude certainty between brand attitudes and purchase intentions

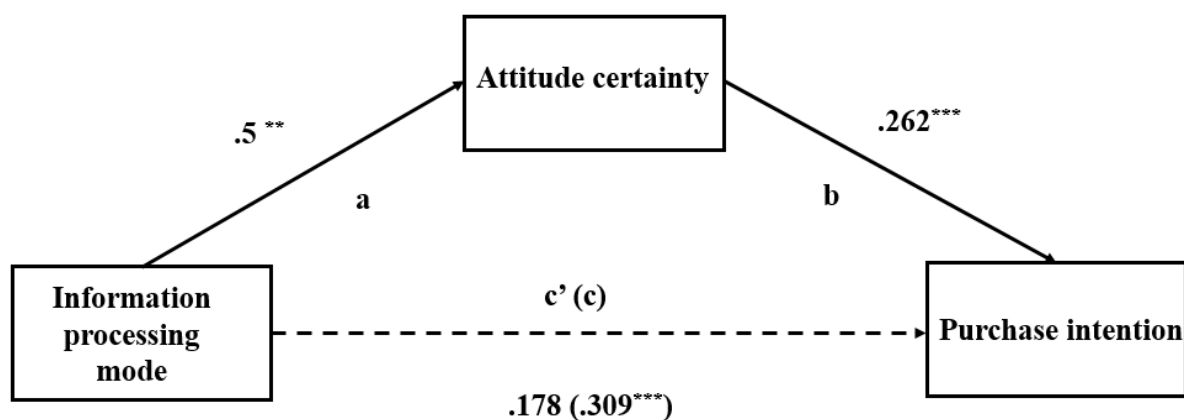
Multiple regression analyses show that brand attitudes are positively associated with purchase intentions ($B = .924$, $t(364) = 19.99$, $p < .001$). Brand attitudes and attitude certainty are also closely related ($B = .234$, $t(364) = 4.8$, $p < .001$). Moreover, after controlling for attitude certainty, the relationship between brand attitude and purchase intentions becomes slightly less significant ($B = .906$, $t(364) = 19.05$, $p < .001$). However,

the relationship between attitude certainty and purchase intentions is non-significant ($B = .078$, $t(364) = 1.566$, $p = .118$). Therefore, the mediation effect of attitude certainty on the relation between brand attitude and purchase intention cannot be established.

The mediating role of attitude certainty between information processing mode and purchase intentions

Regression analyses show that the relationship between information processing mode and purchase intentions is statistically significant ($B = .309$, $t(364) = 3.23$, $p = .001$). Information processing mode and attitude certainty are also closely related ($B = .5$, $t(364) = 7.37$, $p < .001$). The relationship between attitude certainty and purchase intentions is also statistically significant ($B = .262$, $t(364) = 3.61$, $p < .001$). Results of the mediation analysis confirmed the mediating role of attitude certainty in the relationship between information processing mode and purchase intentions (95% CI = .052 to .226, zero fell outside of the provided range). Finally, after controlling for attitude certainty, the direct effect of information processing mode on purchase intentions became nonsignificant ($B = .178$, $t(364) = 1.76$, $p = .079$), thus suggesting full mediation. Figure 3 shows the results.

Figure 4.2: Indirect effect of attitude certainty on information processing mode and purchase intentions



Note: * $p < .05$, ** $p < .01$, *** $p < .001$

4.2.6. Conclusion

ANOVA results indicate that H1, H2, and H3 all are unsupported whether the moderation effects of need for cognition are considered on ad attitudes, brand attitudes or purchase intentions. However, there are some statistically significant main effects of need for cognition and message framing on brand attitudes, information processing mode, attitude certainty and purchase intentions. Additionally, the mediating effect of information processing mode between need for cognition and attitude certainty (H4) is found valid (full mediation), whereas H5 is not supported.

Table 4.10: Summary of hypotheses testing

hypotheses types	hypotheses description	results
moderating effect of NFC on message framing	H1a: Individuals with high NFC have more favorable attitude toward two-sided ads (the promoted brand and higher purchase intention of the promoted brand) than those with low NFC.	rejected
	H1b: Individuals with low NFC have more favorable attitude toward one-sided ads (the promoted brand and higher purchase intention of the promoted brand) than those with high NFC.	rejected
moderating effect of NFC on ad format	H2a: Individuals with high NFC level have more favorable attitude toward direct comparative advertising (the promoted brand and higher purchase intention) than those with low NFC level.	rejected
	H2b: Individuals with low NFC level have more favorable attitude toward indirect comparative advertising (the promoted brand and higher purchase intention) than those with high NFC level.	rejected
moderating effect of NFC on message framing and ad format	H3a: Individuals with high NFC level have more favorable attitude toward two-sided direct comparative advertising (the promoted brand and higher purchase intention) than those with low NFC level.	rejected
	H3b: Individuals with low NFC level have more favorable attitude toward one-sided indirect comparative advertising (the promoted brand and higher purchase intention) than those with high NFC level.	rejected
mediating effect of information processing mode (only NFC)	H4: Information processing mode acts as a mediator between NFC level and attitude certainty.	supported
mediating effect of information processing mode (interaction of NFC and message framing/ad format)	H5: Information processing mode acts as a mediator between the interaction (message framing/ad format and NFC level) and attitude certainty.	rejected

5. Discussion

This section includes theoretical and managerial implications of the findings. The theoretical implications of the findings are detailed in terms of the moderating effects of NFC levels, covariates, main effects of ad format and message framing, including the discussion of possible reasons for the findings. Following the theoretical implications are some managerial contributions of the findings.

5.1. Theoretical implications

5.1.1. The moderating effect of NFC level and covariates

Previous research seldom focused on the comparison of direct and indirect comparative ads (e.g. Snyder, 1992; Walker & Anderson, 1991), let alone the discussion of these two types of ad formats with message framing (one and two sided) under high and low NFC level conditions. The proposed hypotheses indicate the matching of the two NFC levels with the two ad formats and message framings (namely, high NFC level with direct comparative and two-sided, and low NFC level with indirect comparative and one-sided), which accounts for some differences of individuals' affective and conative responses. However, *the analysis results do not support that there is an interaction effect of NFC level and message framing/ad format on the three dependent variables (ad and brand attitudes, and purchase intentions; H1, H2 and H3 are not supported)*. It is obvious that *purchase decision involvement, preference for Crest and willingness to try a new toothpaste brand consistently affect individuals' affective and conative responses (the three covariates are statistically significant across the five dependent variables)*. These variables may lead to the statistical non-significance of the three independent variables in the model (message framing, ad format and need for cognition levels). Previous studies consider some variables such as *brand loyalty* and *personality traits* (Goodwin & Etgar, 1980), and market position of the sponsored brand (Iyer, 1988) to significantly impact the effectiveness of comparative advertising. Goodwin and Etgar (1980) state that consumers who exhibit substantial brand loyalty to the compared brand in comparative advertising may be more likely to resent the comparative claims and to disbelieve them. In this study, based on online statistics and the

first pretest, the toothpaste brand Crest is the market leader. Additionally, when asked about the extent to which they liked Crest, most respondents liked Crest. Because of their *preference for Crest*, individuals might dislike the information that compares the promoted brand with Crest in one-sided direct comparative advertising. They cannot believe that the promoted brand is better than Crest in some attribute, and thus do not have very favorable attitudes toward the ad and the promoted brand. Thus, it is logical to think that the *willingness to try a new brand* also can significantly affect individuals' responses, since individuals who scored lower in this item may be quite conservative toward a new brand and not have favorable evaluations on it. In terms of *purchase decision involvement*, those who think toothpaste choice is very important to them and are more involved in decision making are more likely to have neutral attitudes toward the ad and the promoted brand, and more unwilling to try it because they are more cautious and difficult to be convinced simply by an advertisement, regardless of how much ad format and message framing suit their NFC level.

In terms of the *other two covariates (familiarity of direct and indirect comparative advertising)*, they are both statistically non-significant across the five dependent variables, except for the significant effect of familiarity of indirect comparative advertising on information processing mode. Theories of optimal arousal posit that stimuli that are moderately novel or surprising will be preferred over stimuli that offer too much or too little novelty (Berlyne, 1971). The extent of arousal is based on a discrepancy from the "adaptation level" and minor adaptation level can generate positive affect (Crowley & Hoyer, 1994). If this theory is applied to direct and indirect comparative advertising, people who are not very familiar with either ad format are more likely to perceive the ad to be novel or surprising than those who are not and thus have more favorable responses. Goodwin and Etgar (1980) find the novelty of comparative ads contributes to their effectiveness. Jeon and Beatty (2002) also attribute their finding that Korean consumers prefer direct to indirect messages to their unfamiliarity with comparative advertising. However, *this finding indicates that the degree of familiarity of ad format doesn't play a role so important as to affect individuals' responses.*

5.1.2. The effect of ad format

Surprisingly, ad format (direct vs. indirect comparative) did not have main effects on each of the five dependent variables. Miniard et al. (2006) found that direct and indirect

comparative advertisements are equally effective in developing a non-competitive positioning (they used a non-relative measure to test individuals' attitude toward the sponsored brand). *The statistical non-significance between the effect of direct and indirect comparative advertising on brand attitudes in this study reinforces this previous finding.* Miniard et al. (2006) support this hypothesis by stating that the effectiveness of different advertising types in achieving a noncompetitive position (nonrelative brand attitudes) should depend on the noncomparative information provided by each type. As direct and indirect comparative advertisements provided the same opportunity to form the same nonrelative mental representation (Miniard et al., 2006), individuals might focus on the recall of the noncomparative toothpaste attributes when asked about their attitudes toward the brand with a non-relative measure. It may explain why there is no main effect of ad format on brand attitudes in this study, where a non relative measure of brand attitude is used ("I like the promoted brand" rather than "I like the promoted brand more than other brands/Crest").

5.1.3. Message framing's main effects

Many studies indicate that two-sided advertising can result in higher ratings of A_{ad} and A_{br} than one-sided advertising (Belch, 1981; Kamin, 1989). However, in this study, there is no statistically significant difference between the effects of one- and two-sided advertising on ad attitudes, and in terms of brand attitudes and purchase intentions individuals even scored higher for one- than for two-sided ads. *This result may be attributed to the attribution theory and the trade-off effect.* Attribution theory describes the processes an individual goes through in assigning causes to events (Kelley & Michela, 1980). Attribution theory has been applied to two-sided advertising research. The inclusion of negative information makes consumers believe that the advertiser is honest and shows the actual attributes of a sponsored product, whereas one-sided advertising makes consumers think that the advertiser sells the product more out of desire than honesty (Settle & Golden, 1974). There are many empirical evidences that support the finding that two-sided advertising enhances source credibility (Stayman et al., 1987; Swinyard, 1981). In this study, two-sided ads also receive more company credibility and less bias than one-sided ones. This study proves that enhanced credibility and perception of less bias do not necessarily mean more favorable affective and

conative responses (attitudes toward the ad and brand, and purchase intentions). One reason that may account for this result is the trade-off between gains in credibility and the overall persuasiveness of the message (Crowley & Hoyer, 1994). Crowley and Hoyer (1994) find that many previous studies have mixed results of the effect of message framing on brand attitudes and purchase intentions, and they attribute this finding to the trade-off effect. In this study, although the two attributes that are disclaimed in the two-sided ads are much less important, the first pretest shows that the variance of the two attributes is still quite high, indicating they are very important attributes to some individuals. These individuals may find that the risk of the negative attributes included outweighs the gains associated with enhanced credibility in the two-sided ads, and consequently they do not have very favorable attitudes toward the brand and high purchase intentions. Another reason for individuals in this study having more favorable brand attitudes and higher purchase intentions in one-sided ads may be the design of the information structure in the two-sided ads. Hastak and Park (1990) find that negative information should not be placed first in an advertising message. In this study, the negative attributes are placed in the first line. It may be “unbelievable” to consumers to place negative information at the very beginning in an ad (Crowley & Hoyer, 1994), thus reducing consumers’ perceptions that the advertiser is honest. Thus, this information structure which features negative attributes in the first place may receive less favorable responses from the individuals in this study.

Additionally, *the findings show that participants feel more certain about their attitude in two- than one-sided ads. It reinforces the results from some studies (e.g. Rucker, Petty, & Briñol, 2008), in which participants who received the two-sided frame held their attitude with greater certainty. Admittedly, a source that considers negatives can help remove some concern over possibly missing negative information, and people thus feel more knowledgeable and more certain (Rucker, Petty, & Briñol, 2008). However, their research shows that participants had equally positive brand attitudes regardless of their exposure to one- or two-sided ads (Rucker, Pettys & Briñol, 2008), which is contradictory to our analysis results. This contradiction proves the mixed results of the effect of message framing on brand attitudes (Crowley & Hoyer, 1994).*

5.1.4. The mediating role of information processing mode and attitude certainty

However, the analysis results still support one proposed hypothesis (the mediation effect of information processing mode between NFC levels and attitude certainty), *indicating that information processing mode is a very important variable that contributes to the relationship between NFC levels and attitude certainty*. Previous research has manipulated imagery/analytical information processing in various ways such as instructions or ad executional cues (Thompson & Hamilton, 2006). These studies imply that some variables such as ad executional cues are very effective factors to differentiate information processing mode so that they can be used as methods to manipulate imagery and analytical information processing mode. Admittedly, whether individuals process information in an analytical/imagery way depends on many variables such as situational contexts and individual differences (Bagozzi, 2008; Wyer, Hung, & Jiang, 2008). In this study, the support of the mediation effect of information processing mode on the relationship between NFC levels and attitude certainty shows that individuals with high NFC levels have more analytical information processing than those with low NFC levels, both before and after controlling for the covariates. It shows the important role of NFC level in determining individuals' information processing styles.

The analysis results also support the mediation effect of attitude certainty between information processing mode and purchase intentions. Although some studies have focused on the relationship between attitude certainty and behavioral consequences such as purchase intentions (Bergkvist, 2009; Laroche et al., 2002), seldom have any researchers studied their relationship with information processing mode. *The findings provide some insights on how these three variables relate to each other, proving that attitude certainty explains the relationship between information processing mode and purchase intentions.*

5.2. Managerial implications

One major contribution of the findings is the effect of message framing on consumers' brand attitudes and purchase intentions. *The finding in this study suggests the use of one-sided ads rather than two-sided ones*. Crowley and Hoyer (1994) have already concluded that the effect of message framing on brand attitudes and purchase intentions is quite ambiguous based on multiple relevant studies, and they also suggest that the mechanism behind the mixed results is attribution theory and trade-off effects. The meta-analysis by

Eisend (2006) shows that up to 50% of negative information with low to moderate importance in the message does not diminish the positive credibility effects of two-sided advertising on brand attitudes. However, in this study although the two-sided test ads also met these criteria (two negative attributes with low to moderate importance out of 8 attributes), the brand attitudes from two-sided ads are still less favorable than that from one-sided ads. Furthermore, *the findings show that participants who were shown two-sided ads are more certain about their brand attitudes than those who were assigned to one-sided ads.* As in this study, those who read two-sided ads had less favorable attitudes than those who saw one-sided ads, it means they were more certain about their less favorable brand attitudes. Since attitude certainty has been shown to have a number of important consequences (e.g. guide behavior) (Tormala & Petty, 2004), *two-sided ads may have further detrimental effects on purchase intentions by stimulating consumers to feel more certain about their unfavorable attitudes.* Therefore, *marketers should be cautious if they want to include negative information in their ads. Enhanced credibility and less bias do not mean more favorable attitudes and higher purchase intentions. They should pay more attention to the attributes disclaimed in the ad to ensure they are unimportant as much as possible to the general public.*

This study also indicates that there are no statistically significant differences between the effects of direct and indirect comparative advertising on any of the dependent variables. Previous research (Snyder, 1992) has distinguished direct and indirect comparative advertising. Some differences between them led researchers to find consumers' different responses to the two types of advertising in different conditions (Kalro, Sivakumaran, & Marathe, 2013). On the contrary, this study implies for marketers and practitioners that they do not need to pay much attention to the choice between direct and indirect comparative advertising. Although consumers may easily perceive either ad format, their evaluations of the ad or brand are more dependent on other factors. *Marketers should learn that to meet consumers' interests considering the content in the ad (such as what brand to choose for comparison with the sponsored brand) is more important than the structure of the ad (e.g. ad format).*

The results also do not show any interaction effect of NFC levels and ad format/message framing, leading marketers not to focus on aligning consumers' NFC levels with specific ad format and message framing when designing an ad. Rather, *they should*

consider other factors that may affect consumers' responses such as willingness to try a new brand, preference of the comparison brand and their involvement in the product class.

The two valid mediation effects evidenced by the results show the interrelationship of the four variables (from NFC level, information processing mode, attitude certainty to purchase intentions). Gross, Holtz, and Miller (1995) mention how need for cognition levels may impact attitude certainty when discussing the antecedents of attitude certainty, stating that one might expect persons with a higher need for cognition to be more certain about their attitudes. An attitude held with certainty will be difficult to change; it will be stable (Swann, 1988), and behaviors associated with that attitude should be stable (Fishbein & Ajzen, 1975). It means attitude certainty is a very key factor that impacts purchase behavior and brand loyalty. The findings give some insights on how information processing mode acts in the relationship between NFC level and attitude certainty (including the consequences of attitude certainty). Instead of simply creating ad stimuli to meet consumers' interests, *marketers should be aware of the importance of how consumers process information (more or less analytical) to make them more willing to purchase their brand and have higher brand loyalty, which will largely affect profitability.* For example, advertisers can match ad design with cues that help increase the probability to activate consumers' analytical information processing so that the ad can be more effective among consumers with high NFC level by strengthening the certainty of their favorable attitudes toward the sponsored brand.

6. Limitations and future directions

There are some limitations in this research. *One limitation* is the design of the two-sided test ads. Hastak and Park (1990) find that negative information should not be placed first in an advertising message. However, in this study, the negative attributes are placed in the very beginning. *In future research*, the negative information in a two-sided ad can be placed according to the suggestion by Crowley and Hoyer (1994) that negative attributes should be placed early but not begin with the messages. *Additionally*, in this study the two attributes that were disclaimed in the two-sided ads are not very appropriate as their variances are still high, which indicates some participants might be very sensitive to the negative attributes and thus don't have favorable evaluations. *In future studies*, it is interesting to

design a two-sided ad that includes negative attributes that are not important with very low variance and to explore how this type of two-sided ads impacts participants' response.

The style of the test ads may also be not appealing and realistic since too much text is used and the attributes are not well structured without images that may stimulate consumers to be involved in the test ads. Some participants may not have favorable attitudes toward the sponsored brand simply because of the boring design of the test ads. *In future research*, more interesting ads can be designed with attributes displayed in a more organized and clear manner.

Another limitation may be the selected product category itself, namely toothpaste. The research model implies that consumers expend much effort to process the ad information since consumers' responses are discussed in details. However, toothpaste is not a category that consumers may consider very seriously before purchase, since the choice of one toothpaste over another may not make any obvious difference, and toothpaste is generally an inexpensive product. *Future research* can focus on how different product categories may differ in impacting consumers' responses (toothpaste vs. electronic devices).

In this study, all participants were randomly recruited online. It is more convenient for them to answer questions casually without much thought. *In the future*, focus groups may be used with physically printed ads shown to them. This is a more reliable way to collect data.

Another direction is to add the items of imagery information processing mode to have a more complete picture of how information processing mode explains the relationship from NFC level to attitude certainty and purchase intention.

One central mechanism behind how NFC level impacts information processing mode is the elaboration likelihood model proposed by Petty and Cacioppo (1981, 1986). There are many different conditions that stimulate individuals to expend more or less cognition to process the given information, and these conditions may act similarly as NFC level to exert their impact on information processing mode and attitude certainty. Many researchers have already focused on this aspect. For example, Thompson and Hamilton (2006) found that information processing mode mediates ad cues and ad effectiveness. Ad cues are a condition that differentiates participants' elaboration level. *In future*, researchers can focus on the mediation effect of information processing mode between some other conditions that exert a similar effect (e.g. education level, information seeking).

References

- Bagozzi, R. P. (2008). Some insights on visual and verbal processing strategies. *Journal of Consumer Psychology, 18*(4), 258-263.
- Belch, G. E. (1981). An examination of comparative and noncomparative television commercials: The effects of claim variation and repetition on cognitive response and message acceptance. *Journal of Marketing Research, 18*, 333-349.
- Bergkvist, L. (2009). The role of confidence in attitude–intention and beliefs–attitude relationships. *International Journal of Advertising, 28*(5), 863-880.
- Berlyne, D. E. (1971). *Aesthetics and psychobiology*, New York: Meredith.
- Brown, S. P., & Stayman, D. M. (1992). Antecedents and consequences of attitude toward the ad: A meta-analysis. *Journal of Consumer Research, 19*(1), 34-51.
- Cacioppo, J. T., Petty, R. E., & Feng Kao, C. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment, 48*(3), 306-307.
- Cacioppo, J. T., Petty, R. E., Kao, C., & Rodriguez, R. (1986). Central and peripheral routes to persuasion: An individual difference perspective. *Journal of Personality and Social Psychology, 51*, 1032-1043.
- Chang, C. (2007). The relative effectiveness of comparative and noncomparative advertising: Evidence for gender differences in information-processing strategies. *Journal of Advertising, 36*(1), 21-35.
- Chiesi, F., Morsanyi, K., Donati, M. A., & Primi, C. (2018). Applying Item Response Theory to Develop a Shortened Version of the Need for Cognition Scale. *Advances in Cognitive Psychology, 14*(3), 75-86.
- Childers, T. L., Houston, M. J., & Heckler, S. E. (1985). Measurement of individual differences in visual versus verbal information processing. *Journal of Consumer Research, 12*(2), 125-134.
- Chow, C. W., & Luk, C. L. (2006). Effects of comparative advertising in high-and low-cognitive elaboration conditions. *Journal of Advertising, 35*(2), 55-67.
- Cohen, A. R. (1957). Need for cognition and order of communication as determinants of opinion change. *The order of presentation in persuasion*, C.I. Hovland, ed., 79-97.

- Cohen, A. R., Stotland, E., & Wolfe, D. M. (1955). An experimental investigation of need for cognition. *Journal of Abnormal and Social Psychology*, 51(2), 291.
- Crowley, A. E., & Hoyer, W. D. (1994). An integrative framework for understanding two-sided persuasion. *Journal of Consumer Research*, 20(4), 561-574.
- Eisend, M. (2006). Two-sided advertising: A meta-analysis. *International Journal of Research in Marketing*, 23(2), 187-198.
- Etgar, M., & Goodwin, S. A. (1982). One-sided versus two-sided comparative message appeals for new brand introductions. *Journal of Consumer Research*, 8(4), 460-465.
- Fazio, R. H., & Zanna, M. P. (1978). Attitudinal qualities relating to the strength of the attitude-behavior relationship. *Journal of Experimental Social Psychology*, 14(4), 398-408.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: an introduction to theory and research*. Reading, MA: Addison-Wesley.
- Golden, L. L., & Alpert, M. I. (1987). Comparative analysis of the relative effectiveness of one- and two-sided communication for contrasting products. *Journal of Advertising*, 16(1), 18-68.
- Goodwin, S. M., & Etgar, M. (1980). An experimental investigation of comparative advertising: Impact of message appeal, information load, and utility of product class. *Journal of Marketing Research*, 17(2), 187-202.
- Gross, S. R., Holtz, R., & Miller, N. (1995). Attitude certainty. *Attitude strength: Antecedents and Consequences*, 4, 215-245.
- Hastak, M., & Park, J. W. (1990). Mediators of message sidedness effects on cognitive structure for involved and uninvolved audiences. *ACR North American Advances*.
- Haugtvedt, C. P., Petty, R. E., & Cacioppo, J. T. (1992). Need for cognition and advertising: Understanding the role of personality variables in consumer behavior. *Journal of Consumer Psychology*, 1(3), 239-260.
- Herz, M., & Diamantopoulos, A. (2013). Activation of country stereotypes: automaticity, consonance, and impact. *Journal of the Academy of Marketing Science*, 41(4), 400-417.
- Iyer, E. S. (1988). The influence of verbal content and relative newness on the effectiveness of comparative advertising. *Journal of Advertising*, 17(3), 15-21.

- Jackson, D. W., Brown, S. W., & Harmon, R. R. (1979). Comparative magazine advertisements. *Journal of Advertising Research*, 19(6), 21-26.
- Jeon, J. O., & Beatty, S. E. (2002). Comparative advertising effectiveness in different national cultures. *Journal of Business Research*, 55(11), 907-913.
- Jones, D. A., Shultz, J. W., & Chapman, D. S. (2006). Recruiting through job advertisements: The effects of cognitive elaboration on decision making. *International Journal of Selection and Assessment*, 14(2), 167-179.
- Kalro A. D., Sivakumaran, B., & Marathe, R. R. (2010). Comparative advertising in India: A content analysis of English print advertisements. *Journal of International Consumer Marketing*, 22(4), 377-394.
- Kalro, A. D., Sivakumaran, B., & Marathe, R. R. (2013). Direct or indirect comparative ads: The moderating role of information processing modes. *Journal of Consumer Behaviour*, 12(2), 133-147.
- Kamins, M. A. (1989). Celebrity and noncelebrity advertising in a two-sided context. *Journal of Advertising Research*, 29(6), 34-42.
- Kamins, M. A., & Assael, H. (1987). Two-sided versus one-sided appeals: A cognitive perspective on argumentation, source derogation, and the effect of disconfirming trial on belief change. *Journal of Marketing Research*, 29-39.
- Kao, D. T. (2011). Message sidedness in advertising: The moderating roles of need for cognition and time pressure in persuasion. *Scandinavian Journal of Psychology*, 52(4), 329-340.
- Kelley, H. H., & Michela, J. L. (1980). Attribution theory and research. *Annual Review of Psychology*, 31(1), 457-501.
- Laroche, M., Cleveland, M., & Maravelakis, I. (2002). Attitude accessibility, certainty and the attitude—behaviour relationship: an empirical study of ad repetition and competitive interference effects. *International Journal of Advertising*, 21(2), 149-174.
- MacInnis, D. J., & Price, L. L. (1987). The role of imagery in information processing: Review and extensions. *Journal of Consumer Research*, 13(4), 473-491.

MacKenzie, S. B., Lutz, R. J., & Belch, G. E. (1986). The role of attitude toward the ad as a mediator of advertising effectiveness: A test of competing explanations. *Journal of Marketing Research*, 130-143.

MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research*, 39(1), 99-128.

Manning, K. C., Miniard, P. W., Barone, M. J., & Rose, R. L. (2001). Understanding the mental representations created by comparative advertising. *Journal of Advertising*, 30(2), 27-39.

McGuire, W. J. (1961). The effectiveness of supportive and refutational defenses in immunizing and restoring beliefs against persuasion. *Sociometry*, 24(2), 184-197.

Miniard, P. W., Barone, M. J., Rose, R. L., & Manning, K. C. (2006). A further assessment of indirect comparative advertising claims of superiority over all competitors. *Journal of Advertising*, 35(4), 53-64.

Mittal, B. (1989). Measuring Purchase-Decision Involvement. *Psychology and Marketing*, 6(2), 147-162.

Oliver, R. L., Robertson, T. S., & Mitchell, D. J. (1993). Imaging and analyzing in response to new product advertising. *Journal of Advertising*, 22(4), 35-50.

Pechmann, C., & Stewart, D. W. (1990). The effects of comparative advertising on attention, memory, and purchase intentions. *Journal of Consumer Research*, 17(2), 180-191.

Petty, R. E., & Cacioppo, J. T. (1981). Electromyograms as measures of extent and affectivity of information processing. *American Psychologist*, 36(5), 441.

Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In *Communication and persuasion* (pp. 1-24). Springer, New York, NY.

Petty, R. E., & Krosnick, J. A. (1995). Attitude strength: An overview. *Attitude strength: Antecedents and consequences*, 1, 1-24.

Polyorat, K., Alden, D. L., & Alden, D. L. (2005). Self-construal and need-for-cognition effects on brand attitudes and purchase intentions in response to comparative advertising in Thailand and the United States. *Journal of advertising*, 34(1), 37-48.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36(4), 717-731.

Raju, S., Unnava, H. R., & Montgomery, N. V. (2009). The moderating effect of brand commitment on the evaluation of competitive brands. *Journal of Advertising*, 38(2), 21-36.

Roehm, M. L. (2001). Instrumental vs. vocal versions of popular music in advertising. *Journal of Advertising Research*, 41(3), 49-58.

Rucker, D. D., Petty, R. E., & Briñol, P. (2008). What's in a frame anyway?: A meta-cognitive analysis of the impact of one versus two sided message framing on attitude certainty. *Journal of Consumer Psychology*, 18(2), 137-149.

See, Y. H. M., Petty, R. E., & Evans, L. M. (2009). The impact of perceived message complexity and need for cognition on information processing and attitudes. *Journal of Research in Personality*, 43(5), 880-889.

Settle, R. B., & Golden, L. L. (1974). Attribution theory and advertiser credibility. *Journal of Marketing Research*, 11(2), 181-185.

Shao, A. T., Bao, Y., & Gray, E. (2004). Comparative advertising effectiveness: A cross-cultural study. *Journal of Current Issues and Research in Advertising*, 26(2), 67-80.

Snyder, R. (1992). Comparative advertising and brand evaluation: Toward developing a categorization approach. *Journal of Consumer Psychology*, 1(1), 15-30.

Sujan, M. (1985). Consumer knowledge: Effects on evaluation strategies mediating consumer judgments. *Journal of Consumer Research*, 31-46.

Swann, W. B., Pelham, B. W., & Chidester, T. R. (1988). Change through paradox: using self-verification to alter beliefs. *Journal of Personality and Social Psychology*, 54(2), 268.

Thompson, D. V., & Hamilton, R. W. (2006). The effects of information processing mode on consumers' responses to comparative advertising. *Journal of Consumer Research*, 32(4), 530-540.

Tormala, Z. L., & Petty, R. E. (2004). Source credibility and attitude certainty: A metacognitive analysis of resistance to persuasion. *Journal of Consumer Psychology*, 14(4), 427-442.

Walker, B. A., & Anderson, H. H. (1991). Reconceptualising comparative advertising: a framework and theory of effects. In Holman R. H., Solomon M. R. (eds). *Advances in Consumer Research*. Association for Consumer Research: Provo, UT, 342-347.

Wilkie, W. L., & Farris, P. W. (1975). Comparison advertising: Problems and potential. *The Journal of Marketing*, 7-15.

Wyer Jr, R. S., Hung, I. W., & Jiang, Y. (2008). Visual and verbal processing strategies in comprehension and judgment. *Journal of Consumer Psychology*, 18(4), 244-257.

Yagci, M. I., Biswas, A., & Dutta, S. (2009). Effects of comparative advertising format on consumer responses: The moderating effects of brand image and attribute relevance. *Journal of Business Research*, 62(8), 768-774.

Zajonc, R. B. (1984). On the primacy of emotion. *American Psychologist*, 39(2), 117-123.

Appendices

Table A.4.1: Tests of Between-Subjects Effects (ANCOVA, ad attitude)

Tests of Between-Subjects Effects					
Dependent Variable: ad attitude					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	110.298a	12	9.191	14.701	0
Intercept	65.134	1	65.134	104.176	0
preference_for_Crest	15.76	1	15.76	25.206	0
willingness_new_toothpaste_brand	50.657	1	50.657	81.02	0
familiarity_DCA	2.17	1	2.17	3.471	0.063
familiarity_ICA	0.245	1	0.245	0.391	0.532
purchase_involvement	7.555	1	7.555	12.083	0.001
ad_format	0.008	1	0.008	0.013	0.911
message_framing	0.66	1	0.66	1.055	0.305
NFC_level	0.112	1	0.112	0.179	0.672
ad_format * message_framing	0	1	0	0.001	0.98
ad_format * NFC_level	0.297	1	0.297	0.476	0.491
message_framing * NFC_level	0.13	1	0.13	0.207	0.649
ad_format * message_framing * NFC_level	0.653	1	0.653	1.045	0.307
Error	220.708	353	0.625		
Total	11644.59	366			
Corrected Total	331.006	365			

a R Squared = .333 (Adjusted R Squared = .311)

Table A.4.2: Tests of Between-Subjects Effects (ANCOVA, brand attitude)

Tests of Between-Subjects Effects					
Dependent Variable: brand attitude					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	202.105 ^a	12	16.842	11.901	0
Intercept	46.885	1	46.885	33.129	0
familiarity_DCA	2.836	1	2.836	2.004	0.158
familiarity_ICA	1.494	1	1.494	1.056	0.305
purchase_involvement	2.3	1	2.3	1.626	0.203
preference_for_Crest	22.221	1	22.221	15.701	0
willingness_new_toothpaste_brand	63.023	1	63.023	44.532	0
ad_format	0.148	1	0.148	0.105	0.746
message_framing	74.546	1	74.546	52.674	0
NFC_level	1.972	1	1.972	1.394	0.239
ad_format * message_framing	1.607	1	1.607	1.135	0.287
ad_format * NFC_level	1.391	1	1.391	0.983	0.322
message_framing * NFC_level	0.017	1	0.017	0.012	0.914
ad_format * message_framing * NFC_level	6.021	1	6.021	4.254	0.04
Error	499.575	353	1.415		
Total	9591.063	366			
Corrected Total	701.68	365			

a R Squared = .288 (Adjusted R Squared = .264)

Table A.4.3: Tests of Between-Subjects Effects (ANCOVA, information processing mode)

Tests of Between-Subjects Effects					
Dependent Variable: information processing mode					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	82.853 ^a	12	6.904	9.683	0
Intercept	121.93	1	121.93	170.998	0
familiarity_DCA	0.314	1	0.314	0.441	0.507
familiarity_ICA	2.757	1	2.757	3.867	0.05
purchase_involvement	13.097	1	13.097	18.368	0
preference_for_Crest	8.17	1	8.17	11.457	0.001
willingness_new_toothpaste_brand	11.808	1	11.808	16.559	0
ad_format	0.262	1	0.262	0.368	0.544
message_framing	1.708	1	1.708	2.395	0.123
NFC_level	14.509	1	14.509	20.348	0
ad_format * message_framing	0.021	1	0.021	0.03	0.862
ad_format * NFC_level	0.094	1	0.094	0.132	0.717
message_framing * NFC_level	0.854	1	0.854	1.198	0.274
ad_format * message_framing * NFC_level	1.1	1	1.1	1.543	0.215
Error	251.707	353	0.713		
Total	12738.22	366			
Corrected Total	334.56	365			

a R Squared = .248 (Adjusted R Squared = .222)

Table A.4.4: Tests of Between-Subjects Effects (ANCOVA, attitude certainty)

Tests of Between-Subjects Effects					
Dependent Variable: attitude certainty					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	86.866 ^a	12	7.239	4.581	0
Intercept	87.014	1	87.014	55.07	0
preference_for_Crest	26.063	1	26.063	16.495	0
willingness_new_toothpaste_brand	9.106	1	9.106	5.763	0.017
familiarity_DCA	1.239	1	1.239	0.784	0.377
familiarity_ICA	2.037	1	2.037	1.289	0.257
purchase_involvement	13.993	1	13.993	8.856	0.003
ad_format	0.316	1	0.316	0.2	0.655
message_framing	11.761	1	11.761	7.443	0.007
NFC_level	5.178	1	5.178	3.277	0.071
ad_format * message_framing	0.179	1	0.179	0.113	0.737
ad_format * NFC_level	1.652	1	1.652	1.046	0.307
message_framing * NFC_level	0.001	1	0.001	0.001	0.977
ad_format * message_framing * NFC_level	3.038	1	3.038	1.923	0.166
Error	557.763	353	1.58		
Total	10633	366			
Corrected Total	644.628	365			

a R Squared = .135 (Adjusted R Squared = .105)

Table A.4.5: Tests of Between-Subjects Effects (ANCOVA, purchase intention)

Tests of Between-Subjects Effects					
Dependent Variable: purchase intention					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	351.584 ^a	12	29.299	13.031	0
Intercept	0.229	1	0.229	0.102	0.75
preference_for_Crest	23.204	1	23.204	10.32	0.001
willingness_new_toothpaste_brand	142.568	1	142.56	63.409	0
familiarity_DCA	0.102	1	0.102	0.045	0.831
familiarity_ICA	4.258	1	4.258	1.894	0.17
purchase_involvement	56.177	1	56.177	24.985	0
ad_format	0.203	1	0.203	0.09	0.764
message_framing	68.968	1	68.968	30.674	0
NFC_level	4.224	1	4.224	1.879	0.171
ad_format * message_framing	3.142	1	3.142	1.397	0.238
ad_format * NFC_level	0.442	1	0.442	0.197	0.658
message_framing * NFC_level	1.847	1	1.847	0.821	0.365
ad_format * message_framing * NFC_level	3.169	1	3.169	1.409	0.236
Error	793.687	353	2.248		
Total	6707.06	366			
Corrected Total	1145.27	365			

a R Squared = .307 (Adjusted R Squared = .283)

INFORMATION AND CONSENT FORM

Study Title: The Moderating Role of Need for Cognition in Consumers' Attitudes toward Ads with Varied Claims

Researcher: Hangyu Gu (Master's student in marketing)

Researcher's Contact Information:

Email Address: hangyu.gu@mail.concordia.ca

Mobile Phone Number: (514) 431 7323

Faculty Supervisor: Michel Laroche

Faculty Supervisor's Contact Information:

Email Address: michel.laroche@concordia.ca

Mobile Phone Number: (514) 848-2424 ext. 2942

Source of funding for the study: Concordia's CASA grant

You are being invited to participate in a research study funded by Concordia's CASA grant. This form provides information about what participating would mean. Please read it carefully before deciding if you want to participate or not. If there is anything you do not understand, or if you want more information, please ask the researcher.

A. PURPOSE

The purpose of the research is to understand the impact of need for cognition on consumers' attitudes toward ads with claims varying in terms of ad format and message appeal.

B. PROCEDURES

If you participate, you will be asked to complete a survey that will take you approximately 10-15 minutes.

As a research participant, your responsibilities would be to carefully read the questions on the survey and to answer them as honestly as possible.

C. RISKS AND BENEFITS

There are no known risks involved when you participate in the research.
This research is not intended to benefit you personally.

D. CONFIDENTIALITY

We will gather the following information as part of this research: your demographic information such as your age and gender and your answers to the questions included in the survey. By participating, you agree to allow researchers to access the information.

We will not allow anyone to access the information, except people directly involved in conducting the research. We will only use the information for the purposes of the research described in this form.

The information gathered will be anonymous. That means that it will not be possible to make a link between you and the information you provide.

We will protect the information by storing in the researcher's hard drive.

We intend to publish the results of the research. However, it will not be possible to identify you in the published results.

We will destroy the information five years after the end of the study.

F. CONDITIONS OF PARTICIPATION

You do not have to participate in this research. It is purely your decision. If you do participate, you can stop at any time. You can withdraw from the research by closing the webpage where you will be answering some questions for the research. In this case, your recorded data will be labeled as incomplete and discarded. You can also ask that the information you provided not be used, and your choice will be respected. If you decide that you don't want us to use your information, write "do not use data" in any text box provided in the study.

As a compensatory indemnity for participating in this research, you will receive \$[x]. If you withdraw before the end of the research, you will not receive any compensation.

There are no negative consequences for not participating, stopping in the middle, or asking us not to use your information.

G. PARTICIPANT'S DECLARATION

I have read and understood this form. I have had the chance to ask questions and any questions have been answered. I agree to participate in this research under the conditions described.

Yes, I agree to participate in this study

No, I don't agree to participate in this study

If you have questions about the scientific or scholarly aspects of this research, please contact the researcher (hangyu.gu@mail.concordia.ca). Their contact information is on page 1. You may also contact their faculty supervisor (michel.laroche@concordia.ca).

If you have concerns about ethical issues in this research, please contact the Manager, Research Ethics, Concordia University, 514.848.2424 ex. 7481 or oor.ethics@concordia.ca.

QUESTIONNAIRE

PRETEST 1

Q1 What is your gender

- ☐ Male (1)
- ☐ Female (2)

Q2 What is your age

- ☐ Under 16 (1)
- ☐ 17-25 (2)
- ☐ 26-35 (3)
- ☐ 36-45 (4)
- ☐ 46-55 (5)
- ☐ Over 55 (6)

Q3 How would you describe your race or ethnicity

- ☐ Native American (1)
- ☐ Asian (2)
- ☐ African American/Black (3)
- ☐ Caucasian/White (4)
- ☐ Hispanic/Latino (5)
- ☐ Pacific Islander (6)
- ☐ Multiracial (7)
- ☐ Others (8)

Q4 What is your highest level of education

- ☐ Attended high school but did not finish (1)
- ☐ High school diploma (2)
- ☐ Attended college but did not finish (3)
- ☐ Vocational or technical degree or certificate (4)
- ☐ Associate's degree (5)
- ☐ Bachelor's degree (6)
- ☐ Master's degree (7)
- ☐ Doctorate degree (8)

Q1 Are you familiar with the following toothpaste brands

	Not familiar at all (1)	Slightly familiar (2)	Moderately familiar (3)	Very familiar (4)	Extremely familiar (5)
Colgate (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Euthymol (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Arm & Hammer (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crest (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sensodyne (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oral-B (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aquafresh (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2 Do you often consider changing a brand when buying toothpaste

- ☐ Definitely yes (1)
- ☐ Probably yes (2)
- ☐ Might or might not (3)
- ☐ Probably not (4)
- ☐ Definitely not (5)

Q3 Which of the following toothpaste brand do you choose the most for your toothpaste purchase

- ☐ Euthymol (1)
- ☐ Colgate (2)
- ☐ Oral-B (3)

- Sensodyne (4)
- Arm & Hammer (5)
- Crest (6)
- Aquafesh (7)
- Others (8)

Q4 Please consider how much important the following attributes of toothpaste are to you

	Not important at all (1)	slightly important (2)	moderately important (3)	Very important (4)	Extremely important (5)
restore teeth to whiteness (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
freshen breath (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
prevent cavity (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
repair sensitive teeth against sensitivity (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
flavour (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
price (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
remove tartar (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
protect gum (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

protect enamel (9)	○	○	○	○	○
kill harmful germs (10)	○	○	○	○	○

FOUR TEST ADS

Figure A.4.1: One-sided indirect comparative ad



TOOTHPASTE

DOUBLE GUARD

TOOTHPASTE

VIAILA

C⁺ VITAMIN

Clinical tests show VIAILA DOUBLE GUARD toothpaste repairs sensitive teeth more than other toothpaste brands.

What's more, this toothpaste is clinically proven to be **25% MORE EFFECTIVE** at protecting gum* and enamel than other toothpaste brands!!!

According to consumer survey, DOUBLE GUARD toothpaste has a refreshing flavour. Clinical tests also have found this toothpaste can significantly

- < Prevent cavity
- < Remove tartar
- < Kill harmful germs
- < Freshen breath

*Vitamin C is an essential nutrient for the prevention of gum disease by helping to manufacture collagen, a protein that forms the basis of the connective tissue in the gums.

Figure A.4.2: One-sided direct comparative ad

TOOTHPASTE DOUBLE GUARD



Clinical tests show VIAILA DOUBLE GUARD toothpaste repairs sensitive teeth more than the leading toothpaste brand Crest. What's more, this toothpaste is clinically proven to be **25% MORE EFFECTIVE** at protecting gum* and enamel than Crest!!!

According to consumer survey, DOUBLE GUARD toothpaste has a refreshing flavour. Clinical tests also have found this toothpaste can significantly

- < Prevent cavity
- < Remove tartar
- < Kill harmful germs
- < Freshen breath

*Vitamin C is an essential nutrient for the prevention of gum disease by helping to manufacture collagen, a protein that forms the basis of the connective tissue in the gums.

Figure A.4.3: Two-sided direct comparative ad

TOOTHPASTE DOUBLE GUARD



Although clinical tests show it does not repair sensitive teeth as much as the leading toothpaste brand Crest, VIAILA DOUBLE GUARD toothpaste is clinically proven to be **25% MORE EFFECTIVE** at protecting gum* and enamel than Crest!!!

Although according to consumer survey, DOUBLE GUARD toothpaste has a bitter flavour, clinical tests also have found this toothpaste can significantly

- < Prevent cavity
- < Remove tartar
- < Kill harmful germs
- < Freshen breath

*Vitamin C is an essential nutrient for the prevention of gum disease by helping to manufacture collagen, a protein that forms the basis of the connective tissue in the gums.

Figure A.4.4: Two-sided indirect comparative ad

TOOTHPASTE DOUBLE GUARD



Although clinical tests show it does not repair sensitive teeth as much as other toothpaste brands, VIAILA DOUBLE GUARD toothpaste is clinically proven to be **25% MORE EFFECTIVE** at protecting gum* and enamel than other toothpaste brands!!!

Although according to consumer survey, DOUBLE GUARD toothpaste has a bitter flavour, clinical tests also have found this toothpaste can significantly

- < Prevent cavity
- < Remove tartar
- < Kill harmful germs
- < Freshen breath

*Vitamin C is an essential nutrient for the prevention of gum disease by helping to manufacture collagen, a protein that forms the basis of the connective tissue in the gums.

PRETEST 2

VIALA is a new toothpaste brand. Its company introduces VIALA DOUBLE GUARD toothpaste to the toothpaste market in North America. To promote the toothpaste, the company has designed a print ad to reach its potential customers.

In the next page you will see a sample of the print ad for this toothpaste brand. Please read the content in this ad carefully for at least 10 seconds and accordingly answer some questions about your opinion.

[Test ad image]

Q1 The toothpaste ad you have just seen shows both positive and negative information about VIALA DOUBLE GUARD toothpaste

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
disagree strongly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	agree strongly

Q2 VIALA DOUBLE GUARD toothpaste has much stronger ability to repair sensitive teeth than Crest

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
disagree strongly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	agree strongly

Q3 VIALA DOUBLE GUARD toothpaste has a very agreeable flavor

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
disagree strongly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	agree strongly

Q4 How biased do you think the ad is

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Not at all biased	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely biased

Q5 How credible is the company of VIAILA DOUBLE GUARD toothpaste

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
not credible at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	extremely credible

Q6 What is your opinion about this toothpaste ad

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Good
Uninformative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Informative
Difficult to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Easy to understand
Dislike	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Like

Q1 What is your gender

- ☐ Male (1)
- ☐ Female (2)

Q2 What is your age

- ☐ Under 16 (1)
- ☐ 17-25 (2)
- ☐ 26-35 (3)
- ☐ 36-45 (4)
- ☐ 46-55 (5)
- ☐ Over 55 (6)

Q3 How would you describe your race or ethnicity

- Native American (1)
- Asian (2)
- African American/Black (3)
- Caucasian/White (4)
- Hispanic/Latino (5)
- Pacific Islander (6)
- Multiracial (7)
- Others (8)

Q4 What is your highest level of education

- Attended high school but did not finish (1)
- High school diploma (2)
- Attended college but did not finish (3)
- Vocational or technical degree or certificate (4)
- Associate's degree (5)
- Bachelor's degree (6)
- Master's degree (7)
- Doctorate degree (8)

MAIN TEST

Start of Block: demographic

Q1 What is your gender

- Male (1)
- Female (2)

Q2 What is your age

- Under 16 (1)
- 17-25 (2)
- 26-35 (3)
- 36-45 (4)
- 46-55 (5)
- Over 55 (6)

Q3 How would you describe your race or ethnicity

- Native American (1)
- Asian (2)
- African American/Black (3)
- Caucasian/White (4)
- Hispanic/Latino (5)
- Pacific Islander (6)
- Multiracial (7)
- Others (8)

Q4 What is your highest level of education

- Attended high school but did not finish (1)
- High school diploma (2)
- Attended college but did not finish (3)
- Vocational or technical degree or certificate (4)
- Associate's degree (5)
- Bachelor's degree (6)
- Master's degree (7)
- Doctorate degree (8)

End of Block: demographic

Start of Block: need for cognition

Q1 To what extent are the behaviors stated in the following sentences similar to yours

	extremely unlike me (1)	moderately unlike me (2)	neither unlike nor like me (3)	moderately like me (4)	extremely like me (5)
I would prefer complex to simple problems. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like to have the responsibility of handling a situation that requires a lot of thinking. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thinking is not my idea of fun. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would rather do something that requires little thought than something that is sure to challenge my thinking abilities. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I try to anticipate and avoid situations where there is likely chance I will have to think in depth about something. (5)

☐ ☐ ☐ ☐ ☐

I find satisfaction in deliberating hard and for long hours. (6)

☐ ☐ ☐ ☐ ☐

The idea of relying on thought to make my way to the top appeals to me. (10)

☐ ☐ ☐ ☐ ☐

I really enjoy a task that involves coming up with new solutions to problems. (11)

☐ ☐ ☐ ☐ ☐

Please choose the second option (19)

☐ ☐ ☐ ☐ ☐

I prefer my life to be filled with puzzles that I must solve (13)

☐ ☐ ☐ ☐ ☐

I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought. (15)

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

End of Block: need for cognition

Start of Block: brand introduction

VIALA is a new toothpaste brand. Its company introduces VIALA DOUBLE GUARD toothpaste to the toothpaste market in North America. To promote the toothpaste, the company has designed a print ad to reach its potential customers.

In the next page you will see a sample of the print ad for this toothpaste brand. Please read the content in this ad carefully for at least 10 seconds and accordingly answer some questions about your opinion.

End of Block: brand introduction

Start of Block: test ad

[test ad image]

End of Block: test ad

Start of Block: manipulation check

Q1 The toothpaste ad you have just seen shows both positive and negative information about VIAILA DOUBLE GUARD toothpaste

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
disagree strongly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	agree strongly

Q2 VIAILA DOUBLE GUARD toothpaste has much stronger ability to repair sensitive teeth than other toothpaste brands

1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
-------	-------	-------	-------	-------	-------	-------

disagree strongly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	agree strongly
----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-------------------

Q3 VIAILA DOUBLE GUARD toothpaste has a very agreeable flavor

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
disagree strongly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	agree strongly

Q4 How biased do you think the ad is

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Not at all biased	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely biased

Q5 How credible is the company of VIAILA DOUBLE GUARD toothpaste

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
not credible at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	extremely credible

End of Block: manipulation check

Start of Block: evaluation (ad + brand)

Q1 After observing the toothpaste ad, to what extent do you agree with the following statements about the ad

	extremel y disagree (1)	moderatel y disagree (2)	slightly disagre e (3)	neither disagre e nor agree (4)	slightl y agree (5)	moderatel y agree (6)	extremel y agree (7)
I can understand the ad easliy (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The ad is persuasive (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ad provides useful information (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ad is relevant to consumer needs (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ad is believable (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ad is not offensive (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ad is attractive (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The ad is interesting (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like the ad (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2 After observing the ad, to what extent do you agree with the following statements about the toothpaste brand VIAILA

	extremel y disagree (1)	moderatel y disagree (2)	slightly disagre e (3)	neither disagre e nor agree (4)	slightl y agree (5)	moderatel y agree (6)	extremel y agree (7)
--	-------------------------------	--------------------------------	------------------------------	---	---------------------------	--------------------------	----------------------------

I don't perceive any risk for the promoted brand (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The promoted brand overall has high quality (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have overall positive feelings toward the promoted brand (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like the promoted brand (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: evaluation (ad + brand)

Start of Block: information processing mode

Q1 To what extent do you agree with the following statements about how you were thinking while observing the toothpaste ad

	extremel y disagree (1)	moderatel y disagree (2)	slightly disagre e (3)	neither disagre e nor agree (4)	slightl y agree (5)	moderatel y agree (6)	extremel y agree (7)
--	-------------------------------	--------------------------------	------------------------------	---	---------------------------	-----------------------------	----------------------------

I tried to use as much information about the product features as possible (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I evaluated the toothpaste feature by feature rather than as a whole (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My evaluations were based on careful thinking and reasoning (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Please choose "slightly disagree" (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: information processing mode

Start of Block: attitude certainty

Q1 How certain are you of your attitude toward the promoted brand in the ad

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
not certain at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	extremely certain

Q2 How convinced are you that your attitude toward the promoted brand in the ad is correct

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
not certain at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	extremely certain

End of Block: attitude certainty

Start of Block: purchase intention

Q1 To what extent do you agree with the following statements

	extremely disagree (1)	moderately disagree (2)	slightly disagree (3)	neither disagree nor agree (4)	slightly agree (5)	moderately agree (6)	extremely agree (7)
I am eager to check out VIAILA DOUBLE GUARD toothpaste because of this advertisement (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I intend to try VIAILA DOUBLE GUARD toothpaste (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I plan to buy VIAILA DOUBLE GUARD toothpaste (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I would recommend VIAILA DOUBLE GUARD toothpaste (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
--	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

End of Block: purchase intention

Start of Block: potential covariates

Q1 What is your opinion with regards to comparative advertisements that directly compare the promoted brand with a named competitor

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
not familiar at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	highly familiar
Don't know it well at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Know it very well
Don't recognize it right now	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Recognize it right away

Q2 What is your opinion with regards to comparative advertisements that compare the promoted brand against brands in the category without naming them

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
not familiar at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	highly familiar
Don't know it well at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Know it very well

Don't recogniz e it right now	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Recognize it right away
--	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-------------------------------

Q3 To what extent do you agree with the following statements about your toothpaste choice

	extremel y disagree (1)	moderatel y disagree (2)	slightly disagre e (3)	neither agree nor disagre e (4)	slightl y agree (5)	moderatel y agree (6)	extremel y agree (7)
I choose toothpast e very carefully (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Which toothpast e I buy matters me a lot (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Choosing a toothpast e is an important decision to me (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q4 How much do you like the leading toothpaste brand Crest

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Not like at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Like very much

Q5 Indicate your willingness to try a new toothpaste brand

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Not willing to try at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Willing to try very much

End of Block: potential covariates