

NeuroPsychophysiological Investigation of ASMR Advertising Experience

Abstract

Aim: The framework of this research is to examine the effects of autonomous sensory meridian responses (ASMRs) sensory/impulse circularity, psychological infrastructure, and the effects of brand advertisements using this technique on consumer behaviors and physiological outcomes such as product attitude, purchase intention, advertisement taste, and perceived visual advertisement esthetics. **Materials and Methods:** Mixed research method was used in the study, which consisted of consumers with high depressive mood and anxiety level (experimental group) and consumers with low depressive mood and anxiety level (control group). Electrodermal activity measurement and facial reading (facial coding) analysis are two specific neuromarketing research techniques utilized in this research. In addition, consumer attitude scales and psychological scales were employed. **Results:** According to the results obtained from the findings of the study, the physiological and attitudinal effects of ASMR advertisements do not show significant differences between the experimental and control groups. This is due to the fact that ASMR varies from person to person and has an atypical physiological pattern. **Conclusion:** The fact that ASMR is an ambiguous and contradictory experience with different physiological profiles due to factors such as causality, connectivity and relativity is consistent with the findings of this research.

Keywords: *Autonomous sensory meridian response, consumer neuroscience, consumer psychology, electrodermal activity, facial coding*

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Introduction

Autonomous sensory meridian response (ASMR) is a sensory Internet phenomenon that arouses a certain sensation or feeling in its audience with audiovisual stimuli and has spread rapidly in recent years.^[1,2] Scientifically, it is characterized by the progression of electrostatic-like tingling starting in the head-and-neck regions throughout the body from the spine line.^[3,4] Many of the most popular ASMR videos feature, interpersonal triggers such as whispering and personal attention (e.g., haircuts) and nonperson-centered triggers such as crispy sounds and focused tasks (e.g., towel folding).^[5]

In addition to the physical tingling sensation, researches and anecdotal texts in the field report that ASMR can be used as a therapeutic tool to help relax, struggle insomnia, feel calm, and relieve chronic

pain and anxiety.^[5-11] In this context, ASMR videos are “self-prescribed” by those who experience them as a method of regulating emotions and promoting sleep and healing.^[12]

In the first academic study of the ASMR concept, it was stated that a significant portion of individuals with moderate and severe depression used ASMR videos to alleviate their depression or anxiety symptoms.^[5] Another study examining whether ASMR is associated with differences in personality traits reports that individuals sensitive to ASMR score higher on empathic anxiety, daydreaming, and openness to experience than individuals who do not experience ASMR.^[13]

Neuroscientific research on ASMR videos reports that individuals experiencing ASMR triggers show significant activation in brain regions associated with reward nucleus accumbens, sensory arousal dorsal anterior cingulate cortex, and social and emotional

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behavior (insula). Researchers, who observed significant brain activation in the region of the brain's medial prefrontal cortex associated with social behavior including self-awareness, social cognition, and care during ASMR, suggest that ASMR videos activate the brain similar to real social interaction.^[14] In another study using the electroencephalography (EEG) technique, increased alpha activity was detected in the frontal and parietal regions of individuals with ASMR sensitivity compared to the control group.^[15] Based on the fact that changes in alpha wave activity are generally associated with meditative processes;^[16] the increased alpha wave activity detected by Fredborg *et al.* suggests that the ASMR experience creates a flow-like state, as in some forms of meditation.^[15]

Other studies to test the physiological relevance of ASMR found statistically significant increases in pupil diameter with lower heart rate and increased skin conductance level measurements in participants.^[11,17] The results of studies performed in the field show that ASMR is a contradictory experience with a different physiological profile, a mixed emotional structure, and a social component.^[17]

The psychological infrastructure and sensory dimension of ASMR marketing which is expressed as “white noise” and “silent marketing,” requires it to be examined in a whole with the fields of consumer psychology, consumer neuroscience, and consumer behavior. From this point of view, the attitudes and physiological reactions of consumers with high depressive mood and anxiety levels to advertising stimuli using the ASMR technique, which is stated to be calming and alleviate negative moods^[5,18] are the focus of this research.

Materials and Methods

The study protocol was approved by the Üsküdar University Non Interventional Ethics Committee on February 25, 2022, with the number 61351342/2022 77.

Research design

In the study, the physiological effect of the independent variables (sensory stimuli included in ASMR-based advertisements) on the mediators (experimental and control groups) and their relationship with other dependent variables (advertising liking, product attitude, and purchase intention) are investigated. In this context, a mixed method consisting of two stages was designed. Research processes are given in Figures 1-3.

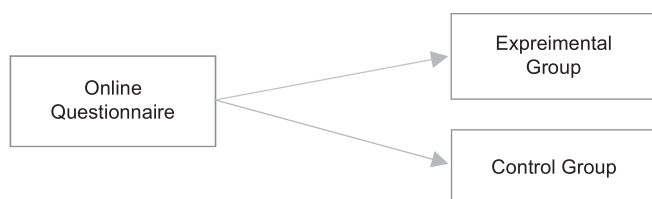


Figure 1: Mediators

Psychological measurements

In the first stage of the study, an online questionnaire is applied with the convenience sampling method. The questionnaire was built with Google Forms and designed in Turkish. The consent of the participants was obtained for the use of the data in the survey within the scope of the research. In the questionnaire, Beck Depression Inventory-II and Beck Anxiety Inventory-II were applied. Turkish validity and reliability of both inventories consisting of 21 items were made.^[19,20] As a result of the online questionnaire, the participants are divided into two groups as high depressive mood/anxiety level (experimental group) and low depressive mood/anxiety level (control group).

Inclusion and exclusion criteria

Individuals ($n = 173$) who met the criteria for the 18–35 years age range ($n = 162$) were included in the online survey. Psychosomatic drug use was determined as the exclusion criterion ($n = 151$) to include individuals with high depressive mood and high anxiety levels in the study. Among the sampling group participating in the online survey, those residing outside of Istanbul ($n = 131$) were not included in the study as they could not participate in the experimental process conducted in the Üsküdar University Neuromarketing Laboratory.

Physiological measurements

The second stage of the study was started with the participants ($n = 40$) who declared that they would voluntarily participate in the research carried out at the Üsküdar University Neuromarketing Laboratory. Appointments were established within 10 days of the administration of the psychological scales.

In the laboratory, four ASMR advertisements from the automotive, food, beverage, and fashion sectors were watched and the neurophysiological reactions of the advertising stimuli were measured in both groups. Electrodermal activity (EDA) and face coding are two specific neuromarketing research techniques used in this research.

To measure the skin conductivity response, the iMotions Shimmer 3 GSR device is used. The device unit consists of an optical heart rate detection probe, optical heart rate sensors, GSR + electrodes, biophysical cables, and wrist strap. It has MSP430 microcontroller (24 MHz, MSP430

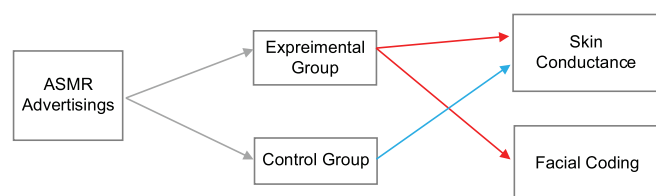


Figure 2: Physiological variables. ASMR: Autonomous sensory meridian response

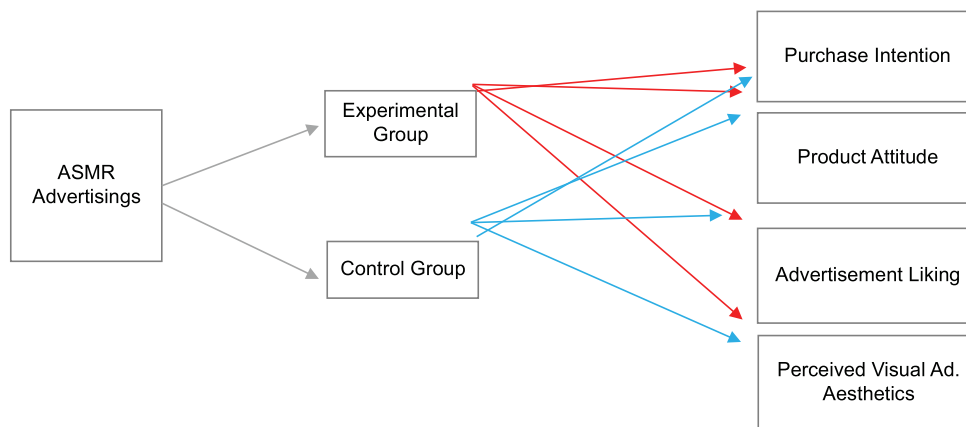


Figure 3: Variables of consumer attitude. ASMR: Autonomous sensory meridian response

CPU), Bluetooth radio (RN-42) integrated 2GB micro SD card, and 450 MAH installable lion battery. GSR level measurement range is $10k-4.7M\Omega$ ($0.2uS-100uS$) $\pm 10\%$. $22k-680k\Omega$ ($1.5-45uS$) $\pm 3\%$. During the experiment, two electrodes (Ag and AgCl surface electrodes) were placed on the second and third fingers of the participant's nondominant hand and the calibration was completed. The data obtained from the EDA device were analyzed by taking the peak point values.^[21]

AFFDEX facial expression analysis module developed by iMotions was used in the research. The iMotions facial coding system identifies emotions by scanning facial expressions, regardless of environmental, contextual, or other factors.^[22] A full HD Logitech brand camera, with 29 mm height, 94 mm width, and 24 mm depth, autofocus at 1080p/30 fps–720/30 fps resolution, was used to obtain the correct face reading data of the individuals.

The calibrations of the participants were completed by sitting comfortably at a distance of 60 cm from the screen and camera. From the module, the participants' seven basic mood values (happiness, surprise, anger, sadness, humiliation, disgust, and fear) for each commercial film were analyzed over time percentage values.^[23]

Consumer attitude

Consumer behavior in today's practice has a psychological background. When it comes to the process of examining consumer behaviors and psychological states, it is understood that examining the effects of depression, which is widely seen today, on consumer behavior is an important research topic.^[24] As a matter of fact, in this study, experimental and control groups are determined according to depression and anxiety scales, and their attitudes that occur when they are exposed to ASMR-based advertising videos are investigated through consumer neuroscience measurements.

To correlate the sensory perception of the participants with the brand marketing performance indicators, they were

asked to answer the survey questions using the scales of purchase intention, product attitude, advertisement liking, and perceived visual advertisement esthetics for four commercials.

The design of the study is shown in Table 1.

Results

The effects of stimulants on independent variables in experimental and control group contrast were analyzed using the Mann–Whitney *U*-Test.

Results of facial coding measurement

In the study, seven basic emotions, anger, sadness, disgust, happiness, surprise, fear, and humiliation, were analyzed based on four different commercials in contrast to the experimental and control groups. The microexpressions that occur while watching commercials in the food, automotive, beverage, and fashion industries are given in the tables [Tables 2-5].

As seen in Table 2, the scores of seven emotions obtained from the face reading measurement of the food brand commercial film did not show a statistically significant difference between the experimental and control groups ($P > 0.05$).

As seen in Table 3, the scores of seven emotions obtained from the face reading measurement of the automotive brand commercial film did not show a statistically significant difference between the experimental and control groups ($P > 0.05$).

As seen in Table 4, the scores of seven emotions obtained from the face reading measurement of the beverage brand commercial film did not show a statistically significant difference between the experimental and control groups ($P > 0.05$).

As seen in Table 5, the scores of seven emotions obtained from the face reading measurement of the fashion brand commercial film did not show a statistically significant difference between the experimental and control groups ($P > 0.05$).

Table 1: Research design

Mediators	Type of influence
ASMR	Physiological – Behavioral
Advertisings	
Experimental group	Condition 1 – Condition 2
Control group	Condition 3 – Condition 4
ASMR: Autonomous sensory meridian response	

Table 2: Food brand facial coding measurement

Facial Coding	Group	n	±SD	Z	P
Anger TP	Control	20	0.00±0.00	-	1.000
	Experiment	20	0.00±0.00		
Sadness TP	Control	20	0.00±0.00	-	1.000
	Experiment	20	0.00±0.00		
Disguss TP	Control	20	0.00±0.00	-	1.000
	Experiment	20	0.00±0.00		
Joy TP	Control	20	4.37±11.4	-0,344	0.731
	Experiment	20	4.33±12.41		
Surprise TP	Control	20	0.00±0.00	-	1.000
	Experiment	20	0.00±0.00		
Fear TP	Control	20	0.04±0.17	-1.000	0.317
	Experiment	20	0.00±0.00		
Contempt TP	Control	20	0.00±0.00		1.000
	Experiment	20	0.00±0.00		

TP: Time Percentage, SD: Standard Deviation

Table 3: Automotive brand facial coding measurement

Facial Coding	Group	n	±SD	Z	P
Anger TP	Control	20	0.03±0.12	-1.000	0.317
	Experiment	20	0.00±0.00		
Sadness TP	Control	20	0.00±0.00	-	1.000
	Experiment	20	0.00±0.00		
Disguss TP	Control	20	0.19±0.77	-1.065	0.287
	Experiment	20	0.01±0.05		
Joy TP	Control	20	0.37±1.45	-1,432	0.152
	Experiment	20	0.00±0.00		
Surprise TP	Control	20	0.02±0.07	-1.000	0.317
	Experiment	20	0.00±0.00		
Fear TP	Control	20	0.28±0.72	-1.777	0.076
	Experiment	20	0.00±0.00		
Contempt TP	Control	20	0.04±0.17	-1.000	0.317
	Experiment	20	0.00±0.00		

TP: Time Percentage, SD: Standard Deviation

Results of electrodermal activity measurement

By taking the peak point values from the EDA device, the data of the control and experimental groups were analyzed with the Mann–Whitney *U*-Test. The table [Table 6] contains data on EDA and heart rate measurement data according to the order of advertisement viewing.

As seen in Table 6, the peak level and black page scores obtained from the skin conductivity measurement of the food, automotive, beverage, and fashion brands did not

show a statistically significant difference between the experimental and control groups ($P > 0.05$).

Results of consumer attitude measurement

Evaluation of consumer attitude scales was carried out with a 5-point Likert scale. There was no statistically significant difference ($P > 0.05$) between the experimental ($n = 20$) and control groups ($n = 20$) in the parameters of product attitude, advertisement likes, perceived visual advertisement esthetics, and purchase intention.

Discussion

The EDA and face coding analyses measured while watching the commercials of the participants showed that there was no statistically significant difference ($P > 0.05$) between the experimental group ($n = 20$) and the control group ($n = 20$).

In a study using an eye-tracking technique, the detection of statistically significant increases in pupil diameter while watching an ASMR video showed the stimulating aspect of ASMR; in another ASMR study using the EEG technique, the detection of increased alpha waves in the frontal and parietal regions reveals that ASMR is associated with mediative processes.^[15] This suggests that the stimulating as well as calming and physiological outcomes^[17] of ASMR may be atypical.

Moreover, it coincides with ASMRs “not for all-aspect” claim.^[25] The fact that ASMR is an uncertain and contradictory experience with different physiological profiles due to factors such as causality, connectivity, and relativity is consistent with the results of this research.^[11,26]

In addition, in group data of EDA, it is seen that there are extreme individual value differences in our study. In this situation, as stated above, the fact that ASMR advertisements have an atypical physiological pattern supports the view that ASMR can be stimulating as well as pleasant and calming.^[17]

In our research, consumer attitude parameters were measured with a 5-point Likert evaluation, in the rating between “1 = I strongly disagree” and “5 = I strongly agree.” The hypothesis that the experimental group would give a positive value compared to the control group based on the depression and anxiety-relieving properties of ASMR in the relevant parameters did not differ statistically in the findings. This is consistent with the fact that Elgün *et al.* revealed that there is no significant cause–effect relationship between depression and consumer styles.^[24]

However, it was observed that the experimental and control groups had an average of three points or more in consumer attitude scales. The fact that the evaluation average of the stimuli is above the scores of “1 = strongly disagree” and “2 = disagree” can be explained by the view that when sensory properties are added to the brand

Table 4: Beverage brand facial coding measurement

Facial Coding	Group	n	±SD	Z	P
Anger TP	Control	20	0.12±0.55	-1.000	0.317
	Experiment	20	0.00±0.00		
Sadness TP	Control	20	0.00±0.00	-	1.000
	Experiment	20	0.00±0.00		
Disguss TP	Control	20	0.06±0.17	-1.432	0.152
	Experiment	20	0.00±0.00		
Joy TP	Control	20	1.87±6.94	-0,827	0.408
	Experiment	20	0.42±1.56		
Surprise TP	Control	20	0.00±0.00	-	1.000
	Experiment	20	0.00±0.00		
Fear TP	Control	20	0.04±0.17	-1.000	0.317
	Experiment	20	0.00±0.00		
Contempt TP	Control	20	0.00±0.00	-	1.000
	Experiment	20	0.00±0.00		

TP: Time Percentage, SD: Standard Deviation

Table 5: Fashion brand facial coding measurement

Facial Coding	Grup	n	±SD	Z	P
Anger TP	Control	20	0.01±0.02	-1.000	0.317
	Experiment	20	0.00±0.00		
Sadness TP	Control	20	0.00±0.00	-	1.000
	Experiment	20	0.00±0.00		
Disgus TP	Control	20	0.00±0.00	-	1.000
	Experiment	20	0.00±0.00		
Joy TP	Control	20	0.11±0.5	-0,651	0.515
	Experiment	20	0.86±2.84		
Surprise TP	Control	20	0.04±0.2	-1.000	0.317
	Experiment	20	0.00±0.00		
Fear TP	Control	20	0.01±0.05	-1.000	0.317
	Experiment	20	0.00±0.00		
Contempt TP	Control	20	0.05±0.22	-1.000	0.317
	Experiment	20	0.00±0.00		

TP: Time Percentage, SD: Standard Deviation

Table 6: Contrast of skin conductivity measurement

Skin Conductivity	Group	n	±SD	Z	P
Food Brand Peak Count	Control	20	1.55±2.58	-0.291	0.771
	Experiment	20	1.00±1.92		
Food Brand Black Page	Control	20	0.05±0.22	-1.041	0.298
	Experiment	20	0.15±0.37		
Automotive Brand Peak Count	Control	20	1.30±2.11	0.125	0.995
	Experiment	20	1.85±3.13		
Automotive Brand Black Page	Control	20	0.05±0.22	-1,066	0.287
	Experiment	20	0.30±0.92		
Beverage Brand Peak Count	Control	20	1.90±2.94	-0.291	0.771
	Experiment	20	1.65±3.41		
Beverage Brand Black Page	Control	20	0.10±0.31	-	1.000
	Experiment	20	0.10±0.31		
Fashion Brand Peak Count	Control	20	1.85±2.78	-0.489	0.625
	Experiment	20	2.45±3.65		
Fashion Brand Black Page	Control	20	0.10±0.31	-0.472	0.637
	Experiment	20	0.15±0.37		

SD: Standard Deviation

stimulus, positive emotion is induced in the consumer without requiring cognitive effort.^[27] In this context; ASMR-based advertisements can have a positive effect on individuals who experience differences in anxiety level and depressive mood, regardless of the consumer psychology factor.

Limitations

Due to the significant relationship between gender role and psychological help-seeking,^[28] the male experimental group's participation in the study was limited and the gender distribution in the study sample could not be kept equal. For this reason, the study was carried out with female participants, which constitutes one of the main limitations of the study. The fact that the study consisted of two periods and that the participants were invited to the laboratory stage during the pandemic process was restrictive, so it was followed by convenience sampling. The research was carried out among Üsküdar University undergraduate and graduate students.

The homogeneity of the sociodemographic structure constitutes one of the limitations of the research since it has a sample free from different effects. Heterogeneous studies are important in terms of reflecting the elements in the research universe to the sample.^[29]

Future researches

In this study, no significant difference was found in physiological reactions between the experimental and control groups. Future studies may design detailed multidisciplinary studies in consumer neuroscience, consumer psychology, and marketing.

Depending on the association of the ASMR concept with an atypical physiological pattern and the results of our research supporting this relationship, future studies can be fed from additional physiological measurements to EDA and face reading analyzes. To obtain different outputs in physiological reactions to sensory stimuli, they can include especially pupil and Photoplethysmogram (PPG) data in their research.

Considering the psychological dimension of the research, adding personality inventories and attention awareness scales to the research in addition to psychological inventories, based on the connectivity between ASMR and personality factors, will add significance to neuromarketing research.

As far as is known, no research has been conducted in the literature on ASMR marketing using the neuropsychophysiological mixed method. In this context, the results of the research can help future studies to develop new methodologies for neuromarketing research that takes into account psychological factors to meet the needs and emotions of real consumers and to examine ASMR marketing, which has a place in the field of sensory marketing.

Multidisciplinary studies investigating the specific forms of consumers – especially benefiting from neuroscience and psychology disciplines – will contribute to the understanding of consumer behavior and literature.

Patient informed consent

Patient informed consent was obtained.

Ethics committee approval

The study protocol was approved by the Üsküdar University Non-Interventional Ethics Committee on 25/02/2022 with the number 61351342/2022-77.

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Conflicts of interest

There are no conflicts of interest to declare.

Author contribution subject and rate

- Esil Sonmez Kence (%50): Design the research, data collection and analyses and wrote the whole manuscript.
- Dr. Selami Varol Ulker (%30): Organized the research and supervised the article write-up.
- Prof. Dr. Sinan Canan (%20): Contributed with comments on manuscript organization and write-up.

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