APPLICATION OF THE IMPLICIT ASSOCIATION TEST IN EVALUATING EMOTIONAL AND RATIONAL BANKING ADVERTISING

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Abstract: *The complexity of financial services and increasing competition in the banking sector create the need for more effective approaches to evaluating advertising communications. In this context, neuromarketing methods are becoming increasingly relevant, as they allow the analysis of implicit consumer reactions that cannot always be identified through traditional survey and self-report methods.*
This article examines the application of the Implicit Association Test (IAT) for evaluating emotional and rational banking advertising. The aim of the study was to identify differences in the formation of consumers' implicit associations under the influence of different types of advertising stimuli related to a banking card.
The practical significance of the study lies in demonstrating the potential of implicit methods for pre-testing advertising materials, improving the effectiveness of marketing communications, and providing a deeper understanding of advertising perception mechanisms in the banking sector.

Key words: *neuromarketing, banking advertising, Implicit Association Test, IAT, consumer behavior, emotional advertising, rational advertising, implicit associations, advertising perception.*

JEL: M31, M37, G21

Introduction

Financial services belong to the category of complex and intangible products, the perception of which is largely determined by the level of trust, the feeling of security, and the subjective perception of risk. Unlike physical goods, banking products cannot be physically evaluated before their actual use, which makes emotional and cognitive perception mechanisms especially important in the decision-making process. In this context, neuromarketing serves as an effective tool for analyzing unconscious consumer reactions and provides a deeper understanding of the mechanisms underlying attitudes toward banking products and communications (Zubareva, 2025).

Neuromarketing offers an alternative approach to studying consumer behavior based on the analysis of hidden emotional and cognitive processes that directly influence customers' financial decisions (Morin, 2011).

Advertising is one of the key areas of marketing in which neuromarketing is actively applied (Ariely & Berns, 2010; Lee et al., 2007). In the banking sector, advertising communications perform not only an informational function, but also contribute to building trust, reducing perceived risk, and strengthening the perceived value of financial products in the minds of consumers.

In this context, neuromarketing becomes an important tool for evaluating advertising effectiveness by identifying which visual, auditory, and textual elements truly attract attention and create positive consumer perception. Understanding consumers' emotional and cognitive reactions makes it possible to create more persuasive and relevant advertising messages, as well as to test advertising materials before their launch (Afsar, 2014; Genco, 2013).

Popularity of Search Queries Related to Neuromarketing, Banking, and Advertising

In order to analyze the relevance and structure of the research field, an analysis of search queries related to the banking sector, advertising, and neuromarketing was conducted using the Google Keyword Planner tool. Based on the obtained data, a keyword map was created to illustrate the interconnections between the main concepts and directions within the studied field.

Figure 1. Interconnection of Keywords Related to Neuromarketing, Banking, and Advertising

Source: Author's own elaboration based on Google Keyword Planner data and Gephi visualizatio

The nodes on the network map represent individual terms with search query frequencies ranging from 70 to 7,480,000 impressions. The connections between nodes reflect associative relationships between terms, and color coding is used to identify thematic clusters formed based on semantic similarity. The main clusters identified within the network structure include banking, neuromarketing, neuromarketing methods, marketing, advertising, and behavior.

The resulting visualization demonstrates a high level of interconnection between marketing, advertising, and behavioral aspects of consumer perception. As shown in the figure, the cluster associated with marketing and advertising is closely integrated with the consumer behavior cluster, reflecting the key role of advertising communications in shaping decision-making processes.

In turn, the cluster related to behavioral aspects is directly connected with the banking sector, indicating the practical significance of neuromarketing approaches in financial services. This confirms that modern banking communications are increasingly viewed not only as tools for information delivery, but also as instruments of emotional and cognitive influence on consumers.

A special role in the network structure is played by the research methods cluster, which includes tools such as EEG, eye-tracking, and implicit methods. This cluster acts as a connecting element between different research directions, providing the methodological basis for analyzing consumers' cognitive and emotional reactions. The presence of these terms on the map confirms the growing interest in studying unconscious mechanisms of consumer behavior.

Kahneman's Model: System 1 and System 2

One of the key theoretical foundations of modern neuromarketing research is the dual-process theory proposed by Daniel Kahneman. This model explains the mechanisms of information perception and decision-making and helps to understand how consumer reactions to advertising stimuli are formed.

According to Kahneman, a significant part of everyday decisions is made through so-called "fast thinking," in which reactions are formed automatically and often without conscious analysis. To describe this mechanism, Kahneman identified two interacting systems of information processing — System 1 and System 2 (Dunbar, L.).

System 1 is characterized by high-speed information processing and operates primarily on an unconscious level. It relies on intuitive judgments, previous experience, emotional reactions, and associative connections. System 1 is responsible for automatic perception of stimuli, rapid decision-making, and the formation of first impressions. Its functioning enables individuals to react quickly to changes in the external environment, which is essential for everyday activity and adaptation.

However, the functioning of System 1 is associated with the use of cognitive shortcuts and heuristics, making it susceptible to cognitive biases and perceptual errors. System 1 operates automatically and requires little cognitive effort or subjective sense of control over the thinking process (Kahneman, D., 2011).

System 2, in contrast, functions slowly and sequentially, relying on rational analysis and conscious control. It becomes active in situations that require logical reasoning, comparison of alternatives, planning, self-control, and deliberate decision-making. The operation of System 2 involves high cognitive effort; therefore, individuals tend to engage it mainly in situations that demand focused attention and analytical information processing.

System 2 supports directed attention and complex cognitive processes, including critical thinking, argument analysis, and conscious decision-making. Its functioning is typically accompanied by a sense of concentration, awareness, and control over one's actions (Kahneman, D., 2011; Drăgoi, D.A., 2024).

Thus, Kahneman's model demonstrates that thinking is not a single unified process but rather the interaction of automatic and reflective mechanisms. The dominance of System 1 allows individuals to respond quickly in routine situations, whereas System 2 provides deeper analysis and conscious choice (Dunbar, L.).

The dual-system theory is particularly important for neuromarketing because a large proportion of consumer decisions are made intuitively and automatically. Neuromarketing research is largely focused on studying System 1 reactions, as this system determines the initial perception of advertising stimuli, the formation of emotional associations, and automatic preferences (Genco, 2013).

This is especially relevant in the context of advertising communications, since primary automatic reactions largely determine subsequent cognitive information processing and the consumer's final attitude toward a product or brand. Understanding the mechanisms of System 1 enables marketers to design advertising messages that more effectively capture attention, evoke emotional responses, and create stable associative connections.

Rational and Emotional Advertising

Advertising can be considered a multi-level communication process that includes input stimuli, internal cognitive and emotional processes, as well as behavioral outcomes (Tellis, G.J., 2004).

The effectiveness of advertising communication largely depends on how deeply the advertising message influences the processes of perception, attention, and emotional evaluation of the consumer (Astolfi et al., 2009).

At the same time, it is becoming increasingly evident that the key factor of advertising effectiveness is not the advertising stimulus itself, but rather the way it is perceived by the consumer's brain (Ambler, Ioannides & Rose, 2000). In this context, the study of the mechanisms involved in processing, assimilation, and storage of advertising information becomes critically important for

understanding the real impact of communication (Plassmann, H., Ambler, T., Braeutigam, S. and Kenning, P., 2007).

In the academic literature, two main types of advertising appeals are traditionally distinguished: rational and emotional.

Rational advertising focuses on communicating information about the functional characteristics, benefits, and advantages of a product. It aims to reduce uncertainty and support reasoned decision-making, which is particularly important in the field of financial services (Albers-Miller & Stafford, 1999).

Emotional advertising, in contrast, is aimed at generating affective reactions and associations such as trust, confidence, joy, and security (Keshari & Jain, 2014).

In the context of companies striving to improve the effectiveness of marketing investments, pre-testing of advertising materials becomes especially important, as it allows the evaluation of advertising potential before market launch (Astolfi et al., 2009).

It is within this context that neuromarketing opens fundamentally new research opportunities by enabling the identification of subconscious audience reactions and allowing researchers to more accurately determine which elements of advertising messages truly influence consumer behavior (Ariely & Berns, 2010; Morin, 2011).

Implicit Association Test (IAT)

The Implicit Association Test (IAT), developed by Greenwald and colleagues, is one of the most widely used methods for measuring unconscious attitudes and associative connections.

This method is based on measuring reaction time during stimulus classification tasks. It is assumed that individuals respond more quickly to stimuli that are already linked through stable associative connections. Differences in reaction time between congruent and incongruent categories make it possible to determine the strength of these associations (Greenwald et al., 2003).

Unlike traditional survey methods, the IAT enables the measurement of hidden attitudes and is less affected by social desirability bias and conscious control from respondents. This makes the method a more effective tool for analyzing unconscious aspects of consumer behavior and increases the accuracy of behavioral prediction (Brunel et al., 2004; Maison et al., 2004; Friese et al., 2006).

In the context of advertising research, the IAT is used to evaluate the strength of associations between advertising stimuli and specific characteristics, including emotional and rational attributes. The use of this method allows for a deeper analysis of advertising perception and helps identify hidden mechanisms underlying the formation of attitudes toward a product or brand.

Research

In order to demonstrate the applicability of the Implicit Association Test (IAT), a study based on the measurement of implicit associations was conducted.

The study involved 24 respondents who actively used banking cards in their everyday lives. The participants' age ranged from 25 to 45 years, which made it possible to target the audience most actively engaged in the use of banking products.

The aim of the study was to evaluate the perception of different types of advertising stimuli, namely rational and emotional images related to banking card usage.

Research Hypotheses

H1. The type of advertising image (emotional vs. rational) influences the formation of implicit associations with a banking card.

H1a. Emotional advertising images create stronger implicit associations with emotional characteristics (calmness, confidence, freedom) than rational images.

H1b. Rational advertising images create stronger implicit associations with functional characteristics (control, benefit, convenience) than emotional images.

H1c. Respondents' reaction time in associating a banking card with relevant characteristics is lower (faster) when the type of image corresponds to the type of characteristics: for emotional creatives — emotional characteristics; for rational creatives — functional characteristics.
H1d. In creatives with neutral visuals, the differences between emotional and rational associations are less pronounced.
H0. The type of advertising image does not have a statistically significant influence on the formation of implicit associations with a banking card.

Research Procedure

The study was conducted using the iCode platform, designed for neuromarketing and implicit research based on the analysis of reaction time and automatic associative connections of consumers. During the experiment, respondents were sequentially shown visual materials containing an integrated image of a banking card. To ensure the consistency of the experiment, the banking card was positioned in the same area across all creatives.
In total, respondents were shown six images: two emotional, two rational, and two neutral.

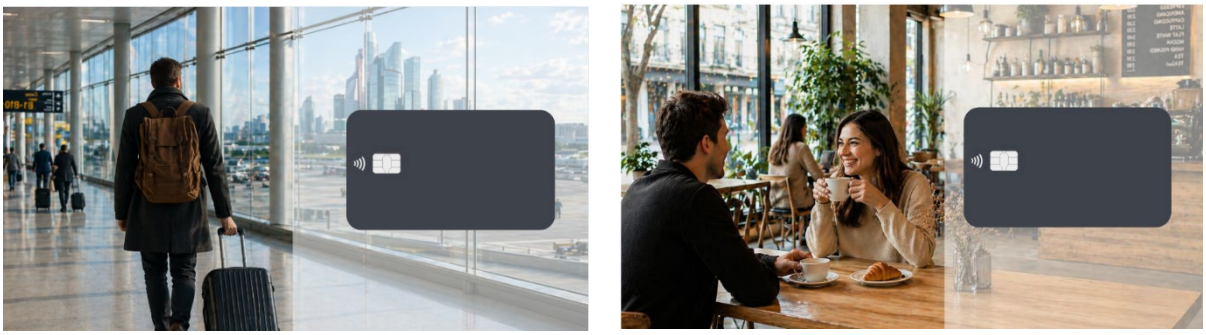

Figure 2. Examples of Emotional Advertising Stimuli
Source: Author's own elaboration

Figure 3. Examples of Rational Advertising Stimuli
Source: Author's own elaboration

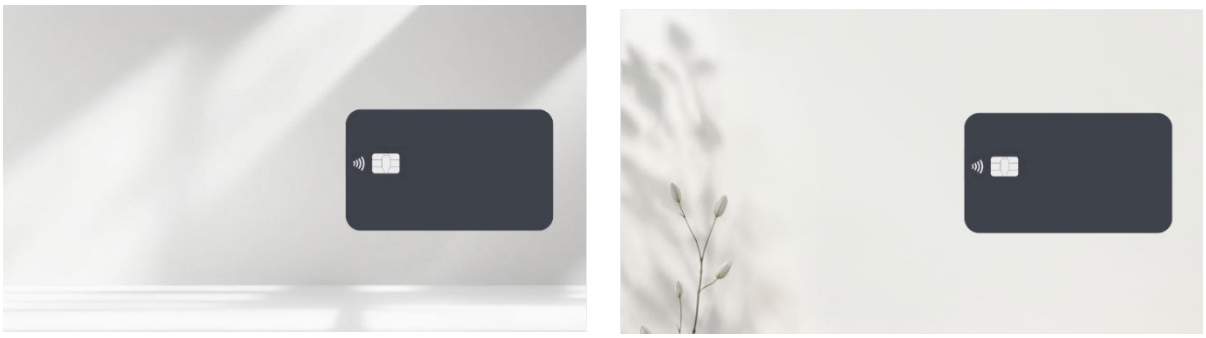

Figure 4. Examples of Neutral Advertising Stimuli
Source: Author's own elaboration

After viewing each image, respondents were asked to select the associations evoked by the creative. For this purpose, two groups of associations were used: emotional and rational.

Emotional associations included categories reflecting affective perception and subjective feelings, such as trust, confidence, and freedom. These associations are linked to automatic reactions and are primarily formed at the level of System 1, which is responsible for fast and intuitive information processing.

Rational associations included characteristics reflecting functional aspects of perception, such as speed, simplicity, and control. These associations are connected with more conscious information processing and correspond to the functioning of System 2, which is oriented toward logical analysis and evaluation of product advantages.

The division of associations into emotional and rational categories made it possible to more accurately assess the nature of advertising perception and identify differences in respondents' unconscious reactions depending on the type of advertising stimulus.

Research Results

Hypothesis H1 is confirmed. The results demonstrate that the type of advertising image influences the formation of implicit associations. The obtained results showed that rational creatives generated stronger and more stable associations with functional characteristics such as speed, simplicity, and control. These associations were characterized not only by a high percentage of positive responses, but also by more confident and stable reactions.

At the same time, emotional creatives generated a significantly higher number of PTC responses. This indicates that emotional advertising stimuli activated more complex internal cognitive and emotional processing. Thus, emotional associations were expressed not only through direct positive responses, but also through hesitation reactions reflecting deeper automatic emotional perception.

Therefore, the type of advertising image significantly influenced both the structure and the nature of implicit associations.

Hypothesis H1a is confirmed. Emotional advertising images created implicit associations with emotional characteristics such as trust, confidence, and freedom. Although these associations were not always expressed through the highest levels of firm positive responses, the PTC analysis demonstrated elevated levels of hesitation for emotional congruent pairs.

Hypothesis H1b is confirmed. Rational creatives demonstrated the highest levels of associative connection with functional characteristics and produced the strongest results within the entire study.

Hypothesis H1c was partially confirmed. It was assumed that respondents would react faster when the type of advertising image corresponded to the type of characteristics.

The results demonstrated that congruent rational pairs produced the fastest and most confident reactions. Rational creatives associated with functional characteristics generated lower hesitation levels and more stable implicit connections.

At the same time, congruent emotional pairs generated higher PTC levels and more hesitation responses. However, this should not be interpreted as the absence of emotional associations. On the contrary, elevated hesitation indicates more complex automatic emotional processing and higher emotional involvement.

Hypothesis H1d was partially confirmed. Neutral visuals demonstrated lower intensity of emotional associations compared to emotional and rational creatives. However, even within neutral contexts, respondents still demonstrated relatively high associative connections with functional characteristics.

In addition, the PTC analysis showed that neutral stimuli also generated hesitation responses, especially regarding simplicity and control. This suggests that banking cards themselves already possess stable implicit functional associations independent of strong advertising context.

Therefore, neutral visuals reduced the intensity of emotional processing but did not completely eliminate associative differences between emotional and rational characteristics.

7.6 The null hypothesis H0 is rejected. The results revealed significant differences both between the types of advertising images and between different visual contexts.

Table 1. Indicators obtained during the research

	n=24	DECLARATIONS	CONFIDENCE LEVELS				DECLARATIONS
BRAND	STATEMENT	YES	FIRM YES	HESITANT YES	HESITANT NO	FIRM NO	NO
neutral_flower	Confidence	38	29	8	17	46	63
	Freedom	46	17	29	21	33	54
	Trust	46	13	33	29	25	54
	Speed	75	50	25	21	4	25
	Simplicity	88	50	38	8	4	13
	Control	58	25	33	25	17	42
rational_process_card	Confidence	57	39	17	17	26	43
	Freedom	52	35	17	22	26	48
	Trust	58	17	42	17	25	42
	Speed	92	58	33	4	4	8
	Simplicity	79	29	50	17	4	21
	Control	67	33	33	21	13	33
emotional_lyfestyle_cafe	Confidence	54	46	8	17	29	46
	Freedom	54	25	29	17	29	46
	Trust	58	25	33	13	29	42
	Speed	70	35	35	22	9	30
	Simplicity	73	45	27	18	9	27
	Control	58	25	33	21	21	42
rational_process_phone2	Confidence	71	50	21	13	17	29
	Freedom	63	29	33	17	21	38
	Trust	63	25	38	25	13	38
	Speed	96	50	46	0	4	4
	Simplicity	96	46	50	0	4	4
	Control	75	46	29	17	8	25
neutral_wave	Confidence	46	33	13	21	33	54
	Freedom	48	30	17	35	17	52
	Trust	43	22	22	35	22	57
	Speed	70	35	35	17	13	30
	Simplicity	83	30	52	9	9	17
	Control	52	24	29	29	19	48
emotional_lyfestyle_airport	Confidence	70	52	17	17	13	30
	Freedom	75	33	42	13	13	25
	Trust	55	27	27	32	14	45
	Speed	83	52	30	13	4	17
	Simplicity	75	42	33	21	4	25
	Control	67	21	46	21	13	33

Source: www.icode-platform.com

Key Findings

The results of the study demonstrate that rational advertising creates stronger and more distinct implicit associations, particularly in relation to functional characteristics such as speed, simplicity, and control. Emotional advertising, in turn, forms more diffuse associations related to subjective states, including trust, freedom, and confidence. At the same time, visual context significantly influences both the perception of advertising images and the formation of associative connections.

The findings also support Daniel Kahneman's dual-system theory of thinking. Rational advertising images are more strongly associated with the activation of System 2, which is responsible for logical analysis, structured information processing, and conscious decision-making, whereas emotional stimuli primarily activate System 1, which is linked to fast, automatic, and associative reactions. In this regard, System 2 demonstrates more stable and predictable responses, while System 1 reactions are characterized by greater variability and dependence on contextual factors.

Conclusions

This study examined the possibility of applying the Implicit Association Test (IAT) to evaluate the effectiveness of advertising images in the banking sector. The obtained results confirm that implicit methods make it possible to identify hidden mechanisms of advertising perception that remain inaccessible through traditional survey-based approaches.

The research demonstrated that the type of advertising image significantly influences the formation of associative connections among consumers. Rational advertising stimuli generated stronger and more stable associations with functional characteristics such as speed, simplicity, and control. This indicates that rational images effectively shape the perception of utilitarian benefits of banking products, which is particularly important in the context of financial decision-making.

Emotional advertising images, in turn, generated associations related to subjective states such as trust, confidence, and freedom. However, these associations appeared less pronounced and more variable, indicating their dependence on context and individual perception. Within the neuromarketing framework, this confirms that emotional stimuli activate more complex and less predictable cognitive processes.

Particular importance within the study was attributed to the visual context of advertising images. It was found that creatives demonstrating the process of using a banking card formed the strongest associations with functional characteristics. At the same time, lifestyle visuals mainly influenced emotional perception, although their effectiveness varied depending on the specific scenario. Neutral images demonstrated the weakest associative connections, confirming their role as a baseline level for comparison.

The results of the study are consistent with Daniel Kahneman's dual-system theory of thinking. Rational advertising stimuli are more closely associated with System 2, which provides structured and conscious information processing, while emotional stimuli activate System 1, which is related to fast and automatic reactions. Neuromarketing methods, in turn, make it possible to capture System 1 reactions, which makes them particularly valuable in the analysis of advertising communications in the banking sector.

Thus, the use of the Implicit Association Test within a neuromarketing framework allows for a deeper analysis of consumer behavior and helps identify differences between declared and actual consumer reactions. The practical significance of the study lies in the possibility of applying implicit methods for pre-testing advertising creatives, improving communication effectiveness, and developing more accurate promotion strategies for banking products.

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