IMPACT OF ADVERTISING ON BEHAVIOUR OF CONSUMERS OF LOW AND HIGH LEVEL OF CONSUMPTION OF DAIRY PRODUCTS

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Abstract. The main goal of this work was to evaluate the influence of the advertising of dairy products on consumer behaviour on the specific market. The objective was completed based on the primary data from a research carried out on a sample of 550 interviewees. The study revealed that examined sample differed in sensitivity to advertising messages depending on the level of consumption. The effectiveness of advertising was measured by operationalizing theoretical model of the advertising impact, namely AIDA. Regression tree models were built across groups of consumers with different consumption levels of dairy products in order to illustrate the differences between them. It was observed that advertising messages of emotional nature have significant importance for heavy users while light users are more sensitive to rational communication.

Key words: consumer behaviour, advertising, dairy market, effectiveness of advertising, regression tree model

INTRODUCTION

Advertisement is an important tool for supporting marketing objectives of an enterprise. The essential features of an advertisement are commercialism, public presentation, high expressiveness and unilateralism [Kotler 2005]. The research shows that consumers succumb to advertisement even though they easily identify its persuasive nature. The reason is that the impact of the advertisement has a very complex nature and is considerably difficult to describe in a holistic way. Researchers can hardly identify the global impact of advertising messages and its importance in the process of purchasing decision [Colley 1961, Jachnis 2007]. Therefore most of the literature on this subject concerns studies on specific elements of the advertisement and how they influence consumer behaviour. Such an approach resulted in proving different meaning of rational and emotional communica-
tion in advertising [Burke, Edell 1989, Smith 1993, Maison 1998, Terelak 1998, Doliński 2000, Berg, Lippman 2001], importance of different forms of expression, like image or colour [Evans et al. 2006], advertisement composition [Doliński 2003], the content of the advertising message [Maison 1998, Doliński 2003], sound elements [Macinnis, Park 1991, Gail 1995] or characters appearing in the advertisement [Ogilvy, Raphaelson 1982, Hatfield, Sprecher 1986, Heath 2006]. Relatively high importance is assigned to the form of the advertising. The most common are scenes from everyday life, animations or demonstration of the product [Jachnis 2007]. Depending on the chosen media, the sender of the advertising may choose from specific forms of expression and thus the senses that are affected. There’s no doubt that the media of wider range and execution capabilities are more persuasive. In that context TV, radio or newspapers have different nature of influence. However, it was shown that the impact of other media of advertising such as outdoor advertising, where the posters are issued at a significant distance from consumers, point of sale advertising or advertisement in the cinema is also important when choosing the product [Miller 1976, Rook 1987, Kirmani 1990, Maddox, Metha 1997, Kuziak 2005, Dolhacz 2006, Kleczek 2006].

The impact of the advertising is usually measured by the effectiveness of the messages defined as a degree to which the assumed objective of the advertising was achieved [Pociecha 1996]. Compared to the efficiency, i.e. the cost of the advertising to income ratio, effectiveness is rather associated with studying the impact on change in consumer behaviour towards the advertised product or whole product category. Studies on the effectiveness of advertising allow for gaining broader perspective and better look at the condition of advertising in the industry. It also helps to answer more general questions about consumers’ sensitivity to advertising, optimal composition of marketing activities for a particular sector and optimal amount of spending on promotion. Additionally, effectiveness of advertising has a considerable impact on its efficiency and provides guidance on planning future marketing activities. Studies on effectiveness of advertising also have high educational value, therefore are commonly carried out for the purpose of exploratory research [Maison 2007].

There are many measures of the effectiveness of advertising that base on different aspects of the advertisement. There are mainly based on analysing the degree to which the advertisement reach the awareness of consumers, the extent to which particular aspects of advertising are memorized, how much consumers are interested in the message, the level of trust consumers have in the advertising message, the degree to which the consumers attitude (and consequently behaviour) toward an advertised product changes by expressing the desire to buy (and consequently buy).

The abovementioned analyses of impact of advertising on consumer behaviour gave birth to many detailed ideas expanding the stages of change in consumer behaviour towards advertising. The AIDA model, developed by L. Strong [Kotler 2005], is one of such concepts. AIDA is a hierarchical model that assumes cause-and-effect relationship between successive stages of the impact of advertising on consumer. Another assumption is the further the stage the lower the audience of the advertising message. The largest number of consumer is exposed to the advertising and inclined to pay attention (stage 1: attention), smaller number of consumer is interested (stage 2: interest) and show desire to
buy (stage 3: desire), and the lowest number is inclined to take action, i.e. buy a product (stage 4: action).

In the course of studies on the impact of advertising many modifications of the original AIDA model were proposed. These included AICA (attention – interest – conviction – action), AIDCAS (attention – interest – desire – conviction – action – satisfaction) or a well-known Coley’s DAGMAR-ACCA model (awareness – comprehension – conviction – action). All these models share a common core drawn from AIDA model, i.e. the sequential information processing process with the following components: conscious perception of advertising, information processing and reaction (so-called think – feel – do). Perception phase consists of cognitive sphere, when consumer spots the advertising message, directs his attention and assimilates the information contained in the message (attention, definition, awareness, stay, perception, comprehension, interest). During the information-processing phase the emotional elements begin appearing when the consumer expresses his preferences or confidence towards the product and shows the desire to own it confronting the advertising message with the knowledge and beliefs (look, desire, conviction, confidence, acceptance). The reaction phase is the last one in the process of the direct impact on consumer and consists of elements related to decision (volitional) and in case of actual purchase also related to the purchase itself and to the post purchase reaction (intention, stimulation, action, buy, satisfaction). The described scheme, with AIDA being the most known representative, is widely used for the empirical verification of the effectiveness of advertising [Łodziana-Grabowska 1996, Pociecha 1996]. However, the model is mainly used for descriptive purposes, therefore it appears legitimate to also attempt statistical modelling based around AIDA.

It is also worth noting, that according to numerous studies [e.g. Maison 1998, Cline, Kellaris 1999, Jachnis 2007], consumers can be differentiated by their reaction to the advertising of different product categories, thus advertising should take this aspect into account. Similar relationships can be observed in different reaction of groups of consumers characterized by different level and specifics of consumption. As previous studies show [Chudzian 2013], consumers of dairy products consumers form clusters according to the level of consumption giving clear evidence for verifying their response to advertising separately. Therefore, the aim of this study is to evaluate impact of individual elements of advertising on market behaviour of consumers of dairy products belonging to different groups according to level of consumption.

MATERIAL AND METHODS

To achieve the goal of the study non-parametric regression models were created in the form of regression trees based on empirical data obtained from 550 respondents. The survey was carried using CAWI1 method – questionnaires were obtained from the poll published on the website of this study. The sample was selected in a composite – the filtering criteria were applied and followed by random selection. The initial criteria for respondent selection were as follows:

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1Computer-assisted web interview.

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— at least incidental level of consumption of dairy products;
— place of residence at most 30 kilometres from one of the nine biggest Polish agglomerations according to CSO and the practice of marketing research agencies\(^2\).

Filtering criteria were selected due to the goal of the study related to analysis of impact of advertising on consumer behaviour – the most interesting group from this perspective formed people who declare to consume dairy products and at the same time, due to living in proximity of big city, have access to wide range of dairy products.

Analysis of characteristics of the experimental group revealed three clusters of respondents differing in the level of consumption of dairy products. Level of consumption in individual product categories was assessed by verifying respondents’ declarations (on 1–5 scale) concerning frequency of consumption of products of a given category. These declarations were used as an input to the cluster analysis using k-means method. The effect was three groups (clusters) of users that differed significantly in terms of the level consumption of dairy products. These groups were named with respect to increasing consumption: light, medium and heavy. Group light consisted of 124 individuals consuming the least dairy, and group heavy consisted of 155 people with high level of consumption. People from an intermediate category – medium (271 individuals) – formed the largest group. Differences of mean levels of consumption between groups of consumers (all differences statistically significant with p-value below 0.001) show that the clustering resulted from natural partition of surveyed respondents. Detailed characteristics of these groups, including differences in demographics characteristics and specific market behaviours, were published in a separate work [Chudzian 2013].

In order to achieve the goal of the study, i.e. to determine the impact of advertising on behaviour of consumers with different levels of consumption of dairy products, one of the non-parametric regression methods was used, namely regression trees modelling. Evaluation and interpretation of the results was carried out using SPSS and R statistical software.

**Feature selection for regression tree**

To build the regression tree AIDA model, presented in theoretical part of this paper, was restated into form allowing for empirical use. As follows from the construction of the model, the frequency of AIDA components decreases with successive stages – the most frequent is watching the advertisement, the least – purchasing under the influence of advertising. At the same time the effectiveness increases with successive stages – it is the highest when ends with purchase and the lowest when seeing the advertising is the last stage. In order to reduce these disparities individual elements forming the index were weighted accordingly. The element A (attention) was weighted 10%, element I (interest) – weighted 20%, element D (desire) – weighted 30% and element A (action) – weighted 40%. To keep AIDA index easily interpretable forming features were scaled to \(<0; 1>\) range, so the index itself took values from this range. Value of such AIDA index was evaluated for each of the respondents expressing individual susceptibility to advertising

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\(^2\)Qualified agglomerations: Warszawa, Poznań, Kraków, Trójmiasto, Katowice, Białystok, Łódź, Lublin and Wrocław.
Aspects of advertising affecting the effectiveness of advertising messages were based on the analysis of literature. Features elements were divided into four groups: different advertising goals (information, demonstration – product application presentation, persuasion; attention – attracting consumer attention, offer; appreciation – thanks for the earlier purchase, recall; competitiveness – showing difference between competing products), different forms of advertising (banners, animation, scenes from everyday life, scenes from the kitchen, scenes with food, outdoor scenes, product manufacturing, product demonstration), elements of advertisement (music, humour, content, graphics, idea, realization, attractiveness, character, length, show time) and types of advertising media (TV, radio, newspapers, Internet, outdoor, vehicles, packaging, point of sale, cinema, e-mail).

All these constituted the set of 26 independent variables taking values from <1; 5> range, with 1 corresponding to low intensity of a particular indicator and 5 to high intensity. During analysis of mutual relations between AIDA index and independent variables it turned out that some of these relationships have multinomial nature. Therefore the set of independent variables was extended with squares of selected indicators.

RESULTS AND DISCUSSION

The goal of the empirical study was to determine the impact of advertising on behaviour of consumers with different levels of consumption of dairy products. For this purpose the previously established levels were used. For identified groups of users consuming dairy products rarely (light), intermediate (medium), and often (heavy) three regression trees were constructed using C&RT\(^3\) algorithm [Breiman et al. 1984]. All independent variables were considered during trees construction. C&RT capabilities were used to choose variables relevant from each model perspective. The procedure consisted of automatic binary division of respondents in subsequent steps into groups of similar AIDA index value within and possible highest variance of AIDA index between the groups. The division is performed through analysis of all factors and searching their values for potential points of split. Based on this analysis a factor and corresponding value are chosen to minimize AIDA variance in the whole regression tree. The tree was expanded as long as new divisions were causing decrease in the variance. Groups of respondents extracted in this was had similar value of AIDA index and similar opinions on factors used to distinguish them.

The impact of advertising on behaviour of light consumers

The mean square prediction error on 10-fold cross-validation of the tree constructed for dairy products consumers who belong to the light users group amounted to 0.063. This means that on average this is the error of predicting consumer’s AIDA index given specific values of independent variables. Constructed regression tree was based on advertisement on packaging and sound elements used in other media (Fig. 1). The first split in

\(^3\)Classification and regression trees.
the tree divided respondents with different opinion on importance of packaging. Those who saw it as important medium are more susceptible to the effects of advertising (avg. AIDA = 0.421). In contrast, among those who do not consider packaging as an important advertising medium but pay attention to sound elements there is a group characterized by even higher score (avg. AIDA = 0.521). The least susceptible to advertising from light users are those who neglect the significance of both packaging and music.

The result of regression tree modelling allow to conclude that sound elements and way of presenting the advertising content on product packaging have a particularly significant impact on behaviour of consumers who rarely purchase dairy products. It follows

Fig. 1. Regression tree model for light users
Source: Own research.
that an effective advertising must first enkindle interest in a product through expressive sound elements or distinctive packaging. It is worth recalling that in the group of light users respondents were mostly educated people, what usually reduces susceptibility to persuasion [Aronson 2005], since it results in a greater awareness of the mechanisms of advertising [Maison 1997]. This may explain the limited number of advertising factors with impact on purchase of dairy products.

The impact of advertising on behaviour of medium consumers

The regression tree model was also constructed for group of medium users (Fig. 2). Corresponding mean squared error on 10-fold cross-validation equalled 0.044. There were three variables corresponding to advertising media among the splits of this tree: TV, outdoors and distinguished advertising on vehicles. Animation and sound elements complemented the list of variables-splits in the tree. The latter was the most important split in the entire tree and in the root of the tree distinguished respondents who considered music important in advertising (avg. AIDA = 0.415). Interestingly, respondents from this group are further differentiated by opinion on animation.

Respondents paying attention to music and animation constituted roughly 30% of the entire group of medium users and at the same time were the most susceptible to advertising (avg. AIDA = 0.480). This has been confirmed in previous studies [Macinnis, Park 1991], where the authors observed that music associated with image and content is usually distinguished by consumers as a single element, which magnifies effect of individual elements and directs the attention of consumers.

Among those who did not recognize importance of music there two more interesting groups. First of them, characterized by high susceptibility to advertising (avg. AIDA = 0.430), consisted of respondents who paid significant attention to outdoors advertising and additionally to a variation of this form, namely advertising on vehicles and in public transport. The second one formed those who were the most resistant to the advertising (avg. AIDA = 0.117) and who rejected the importance of outdoors and TV advertising. This group consisted of as many as 27% of all respondents. Together with the most susceptible to advertising, these two extreme groups accounted for nearly 60% of all medium users.

The impact of advertising on behaviour of heavy consumers

The last regression tree (Fig. 3), constructed on group of heavy users, evaluated at value 0.057 of mean squared error calculated using 10-fold cross-validation schema. In this tree the important factors that allowed for differentiating users where sound elements and three types of media: TV, cinema and newspapers. However, the impact of the latter two is somewhat negligible, as evidence by only a slight improvement in the variance after their induction.

It is visible on the tree model that the first split of respondents was formed around their opinion on importance of TV media. Studies show [Collet for Kall 2002] that consumers differ in time they spend watching TV commercials and how they evaluate its effectiveness. High involvement of heavy users in receiving TV commercial has significant
Therefore those who completely rejected the importance of TV media factor constitute a group of the lowest susceptibility to advertising (avg. AIDA = 0.122).

Among the groups formed by further splitting respondent groups the most interesting one consisted of consumer who point out importance of sound elements and advertising in cinema. The impact of advertising on purchase decisions of this group is very high (avg. AIDA = 0.631), and the group represented 10% of all heavy users. The second

Fig. 2. Regression tree model for medium users
Source: Own research.

meaning here.
most susceptible to advertising group (avg. AIDA = 0.542) consisted of people who did not recognize importance of advertising in cinema, but pointed to the newspapers ads. Respondents from both these group consume large amounts of dairy products and often buy them under the influence of advertisement though seek the information from different sources. They are therefore the group most open to advertising and characterized by frequent contact and active perception of advertising among all 550 respondents.
CONCLUSIONS

In conclusion, regardless of the group, the greatest influence on the purchase of dairy products has TV advertising. This media is effective in reaching all consumers regardless of the level of consumption of dairy products. Studies from other authors show [Dolhasz 2006] that TV is the most popular advertising media in Poland, which – through use of video and audio – has the greatest potential in terms of realization and persuasion. The effectiveness of television commercial may depend significantly on the broadcast conditions (place, time of day, frequency) and its characteristics (duration, length) [Kamins et al. 1991]. Important role in enhancing the effectiveness of TV advertising plays the time of day the ad is broadcasted. Prime time fall between 18:00 and 22:00, but due to the nature of the food products and lifestyle of target group, it is more effective to place this type of commercials in the morning. Therefore, the most effective seems to be to focus viewer’s attention at the beginning of the commercial and shortening its length to increase chances to receive the entire message. Similar effect is achieved by placing ads at the beginning of the advertising block. The research shows [Doliński 2003] that consumers, especially after engaging programs, have higher concentration when receiving the first seconds of advertising block, and then their attention decrease. The result of this observation is the practice of shortening the commercials to increase their frequency [Sutherland, Sylvester 2003]. Especially, as the frequency of exposure to the object is strictly linked with its liking [Zajonc, Markus 1982, Zajonc 1985]. It seems that due to the low involvement of consumers in purchase of dairy products, television is the form of intensive influence that can be effective as it intensively draw consumers’ attention and at the same time does not require them to actively seek information.

In addition, design of advertising of dairy products that combines emotional and rational components appears to be important, with additional assumption that the rational components dominate when communicating to consumers from the light group and emotional elements outweigh others when reaching to consumer with high level of consumption of dairy products. Many authors emphasize that the impact of advertising is different depending on types of presented messages [Burke, Edell 1989, Terelak 1998]. These messages can take form of rational or emotional appeals, inducing positive or negative feelings. In advertising practice it is rare to observe purely emotional or purely rational messages and it should be rather considered to observe dominance of one of these elements [Maison 1998]. For this reason, dynamism of interweaving rational and emotional elements would be the most effective approach with regard to advertising dairy products. This is due to the change of direction and intensity of emotions (both strong and weak positive and negative emotions) and can facilitate the transfer of the consumer-character relation in advertising to consumer-product relation, which could help increasing commitment to the product. This is of particular importance in the context of studied dairy market, which is characterized by generally low level of involvement of consumers.

In conclusion, on the basis of the presented research one can notice that there are large differences in consumer behaviour and the impact of advertising on dairy market. At the same time, due to different models of advertising effectiveness, there is a need to measure consumer behaviour in a disjunctive way and then selectively reach recipients of the dairy products advertising.

4Measurements carried out regularly by TNS Polska.
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Wpływ reklamy na zachowania konsumentów o niskim i wysokim poziomie konsumpcji produktów mleczarskich


Słowa kluczowe: zachowania konsumenckie, reklama, rynek mleczarski, skuteczność reklamy, drzewa regresji

Accepted for print – Zaakceptowano do druku: 25.11.2014