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The Importance of Pictorial Description in Consumer Decision-Making Involving Decoys

[Význam obrázku jako součásti popisu produktu při rozhodování spotřebitelů za přítomnosti návnad]

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Abstract: According to the previous research about consumer behaviour, adding a decoy option to a choice set often increases the individual's preference for one option over the other original option. The literature discusses the information format as one of the moderating factors with qualitative and pictorial information possibly weakening the decoy effect. To test this, this contribution uses the washing machine scenario of decoy effect previously examined where the decoy effect was found to not influence the consumer behaviour. In this paper, the experimental conditions were broadened when it comes to the image format accompanying the alternative description to examine the influence of specific images on the consumer choices to explain the previously reported failure to detect the decoy effect. In total, choices of 959 respondents from a set of the washing machines were collected and analysed using Chi-squared test. The current results indeed indicate the positive decoy effect when the product image was variable in the study design. However, no evidence was found that respondents' choices would be directly influenced by the product image.

Keywords: consumer decision-making, context effects, decoys, product description.

JEL classification: D91, M39

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Introduction

Understanding the consumer decision-making process by researchers and marketers is important for understanding the consumer behaviour, namely how individuals evaluate, obtain and use the products. This knowledge then can help marketers to define suitable elements of the marketing mix that would fit their customers' needs and wants. The research in psychology and human decision-making discovered the impact of context on the choice, according to which the number and structure of available alternatives can influence the consumer preferences. Out of the so-called context effects, the decoy effect is the most popular and most researched in the literature.

The findings in literature point out the importance of various factors on these context effects, including the format of product description. In most studies, the product alternatives are described using the written form, most often with the use of numerical values or matrices. However, the realism of real-life purchases might call also for verbal product presentation or physical presentation of alternatives with the use of sensory perception for product evaluation are highly relevant as well (such as product taste, scent, or visual appearance) depending on the product category. While it is understandable the experiments in social sciences cannot fully reflect all aspects of the complex reality, omitting some factors from experimental designs questions about practical marketing implications of context effects. Nowadays, the use of written form of numerical values together with visual appearance in form of images is highly relevant in terms of growing share of online purchases where physical presentation of products is absent.

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This contribution uses the washing machine scenario of decoy effect previously examined by Kubalová and Klepek (2022) where the decoy effect was found to not influence the consumer behaviour. In this paper, the experimental conditions were broadened when it comes to the image format accompanying the alternative description to examine the influence of specific images on the consumer choices to explain the previous failure to detect the decoy effect.

To fulfil this objective, the paper is arranged as follows. The first section reviews previous literature on the decoy effect and the impact of different kinds of product description on the decoy effect. The second chapter section the method of experiment conducted to test the decoy effect under the condition of variable pictorial description. The results are presented and discussed in the third chapter.

1 Theoretical background

Ever since the decoy effect was described by Huber, Payne and Puto (1989), this contextual effect was examined and applied to many areas of human decision-making, from the choice of job candidates (Kuncel and Dahlke 2020) to the application in non-profit (Pittarello, Caserotti and Rubaltelli 2020). However, traditionally is the decoy effect documented in numerous cases of consumer decision-making while pointing out its significant practical marketing implications as in case of examining the decoys in real diamond market by Wu and Cosguner (2020).

Ahn and Novoa (2016) defined decoy effect as the introduction of a third product in choice set in order to enhance consumer interest in higher-priced products. It is also called the effect of bait or deceptive influence or the effect of attraction or the effect of asymmetric domination, and it is one of the strategies that is used in marketing to influence the decision-making process in customers (Monk et al. 2016).

As described by Sherlin, Siswadhi and Sarmigi (2020, p. 127) and Xiao, Zeng and Feldman (2021, p. 164) decoy works best when there are three options to choose from, so called target, a competitor, and a decoy. Target is the choice the designer of the choice set (a company, a waiter, a seller, a marketer, an advertiser) wants people to make. Competitor is the option that is up against the target and the choice set designer does not want consumers to choose this competitor, even if they previously preferred it. Last one is the decoy, and its task is to shift the choice from the competitor to the target when it is added into the choice sets.

Frederick, Lee and Baskin (2014) and Frederick and Lee (2008) note that decoys have significant effect on individual choices when the product alternatives are defined numerically but it is not as strong when consumers evaluate the products according to more realistic criteria such as qualitative characteristics or images.

Similarly, Yang and Lynn (2014) discovered the positive decoy effect only in two cases out of 54 scenarios when the products were described using qualitative information, without the use of numbers. The authors point out the importance of verbal descriptions and sensory perceptions during shopping and therefore, consider these results unfavourable for marketers who hope to increase market share of their products by using the decoys.

Kubalová and Klepek (2022) also included images in the product description and failed to detect the positive decoy effect in the examined scenario involving washing machines which were described by 4 characteristics, including the price and visual images. Across all examined conditions (brand vs. non brand condition, decoy vs. non-decoy condition), the respondents strongly showed preference for the competitor alternative. This could be accounted to the

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preference for the visual description of the product but has not been confirmed yet. Due to these findings in the literature, the following hypothesis was developed and tested:
H1: The image type directly influences the choice of alternative for the examined product category.

2 Methodology

Following the very same methodology as used in Kubalová and Klepek (2022, p. 17), the respondents' choices were obtained via online survey experiment using the same washing machine choice set with the same values of attributes describing the products, see Figure 1. Similarly, as the original study, it was needed to obtain the data about Czech consumers' choices when the decoy option was included and excluded in the choice set. Therefore, the respondents were divided in to a control and treatment group. There was no decoy included in the control choice set (only competitor and target alternatives), whereas in the treatment choice set product C as a decoy option was included among the alternatives. Respondents also had a chance to not choose any of the available alternative and thus, avoid the choice if they did not prefer any of the presented alternative.

Figure 1: Relative position of the alternatives in the full choice set including decoy

Source: Kubalová and Klepek (2022, p. 17)

The minimal sample size needed was determined using a power sample analysis with the use of free statistical programme G*Power. The considered parameters for the power analysis were the type of statistical test to be used (Chi-squared test), a significance level α (5 %), a statistical power $(1-\beta)$ (80 %), an effect size Cohen's w (0.1) and the degrees of freedom Df (1) which resulted in the minimal total sample of 785 respondents. The minimal total sample was met as in total data about choices of 959 respondents were collected via Trendaro online consumer panel which further raises the statistical power of the used test. The following Table 1 sums up the respondents' characteristics and it can be seen that the characteristics did not differ significantly between the two groups.

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Table 1: Sample characteristics (n = 959)

		Control group (n = 470)	Treatment group (n = 489)
Gender	Female	48.9 %	44.4 %
	Male	51.1 %	55.6 %
Age			
	Min.	20	19
	Max.	84	93
	Median	37	44
	Mean	46	46
Income	Median	21 000 CZK	21 000 CZK
	Mean	22 428 CZK	22 955 CZK
Education	Primary	4.5 %	3.7 %
	Secondary	70.4 %	71.6 %
	Tertiary	25.1 %	24.7 %

Source: own processing

To analyse the impact of a pictorial description on the choices the images accompanying the product description were variable in this experiment instead of fixed. To meet this survey design requirement, Trendaro consumer online panel and their online platform was used as it allows random assignment of respondents into the control and treatment groups as well as randomization of chosen attributes and images in the choice set.

In the Figure 2 are shown the three possible variants of the images that were randomly assigned to the examined product alternatives. Beside the three variants, there was also a possibility the alternatives lacked an image in the description altogether.

Figure 2: Pictorial variants used as product description in online questionnaire

Source: own processing based on heureka.com

To detect presence of decoy effect under the condition of variable image type, the expected shares and the observed shares of alternatives were computed and compared using Chi-squared test Chi-squared test ($\alpha = 0{,}05$). The expected values were computed using the principle of proportionality as found and used in Mishra, Umesh and Stem (1993, pp. 338) according to the formula (1):

$$p(A_L) = p(A;X)*(1 - p(C;Y)) \quad (1)$$

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where: $p(A_L)$ is the expected share of alternative A according the proportionality principle; p(A, X) is the share of alternative A in control group; p(C, Y) is the share of alternative C in experimental group.

It is important to note that initially to measure the decoy effect, only expected and observed shares of alternatives A and B were only compared and tested using the Chi-squared test. The alternative C itself was omitted from the testing for two main reasons: 1) based on the literature, shares of the decoys are not important to measure as decoys only serve to shift the preferences from the competitor to the target; 2) as the decoy was absent in the survey for the control group and present for the treatment group, the difference in the shares of alternative C were tied to the experiment design and therefore, the causal effect of its presence would for sure impact the shares of the alternative C and the overall test.

Although for the purpose of the power sample analysis the effect size was referred to as Cohen's *w*, the statistical effect of the relationship between the decoy presence and the choices is measured and referred to as Cramer's Phi (Φ) in the result section. This can be done as the values of Cohen's w and Cramer's Phi are the same for 2x2 tables (Cohen, 1988, p. 223). However, it is not intended by the author to use both terms randomly and interchangeably throughout the text but rather to meet the formal requirements Cohen's w is used only for its power sample purposes and the actual results are reported via Cramer's Phi which is more commonly used as categorical association coefficient. The Cramer's Phi is based on the following formula (2):

$$\Phi = \sqrt{\frac{\chi^2}{n}} \tag{2}$$

where: χ^2 is the Chi-Squared test statistic and n is the total number of the observations.

Furthermore, to find the influence of the pictorial description on the decoy effect and the choices, the distribution of choices according to the image type was compared and the differences were tested using Chi-squared test ($\alpha = 0.05$).

3 Results

In this chapter, the results of data analysis are presented and discussed. Firstly, the Table 2 presents the hypothetical choices of respondents in the control (n = 470) and treatment group (n = 489). As it can be noticed, in both groups alternative A (competitor) was the most popular among the respondents. However, when the decoy was present as one of the available alternatives the number of respondents who chose target increased while the popularity of the competitor decreased which could be accounted to the positive decoy effect.

Table 2: Distribution of choices based on the decoy presence

Alternative	Control group (n = 470)	Treatment group (n = 489)
A (competitor)	253 (54 %)	213 (44 %)
B (target)	149 (32 %)	175 (36 %)
C (decoy)	-	39 (8 %)
None	68 (14 %)	62 (12 %)

Source: own calculation

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To find out whether this shift in the preferences (increase for the target and decrease for the competitor) was statistically significant expected and observed shares were compared and tested. The observed shares are the true shares measured in the treatment group and the expected shares were computed from the shares measured in the control group based on the proportionality principle according to the previously mentioned formula (1). This comparison is shown in Table 3.

Table 3: Shares of alternatives

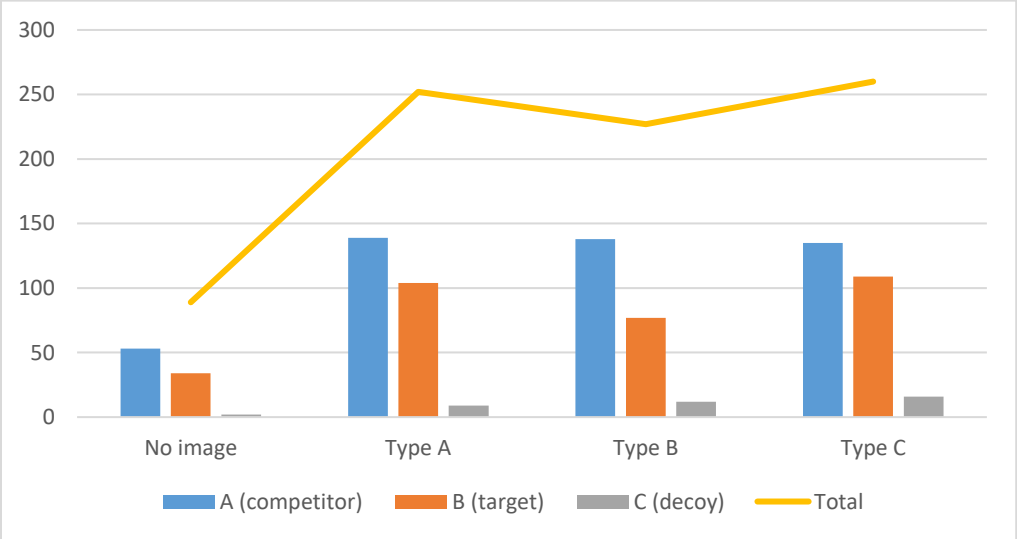
Alternative	Expected share	Observed share
A (competitor)	50 %	44 %
B (target)	29 %	36 %
C (decoy)	8 %	8 %
None	13 %	12 %

Source: own calculation

For the alternative A (competitor), the observed share in experimental group is 6 % lower than the expected share which was computed based on the control group choices using the proportionality principle. At the same time, the observed share of alternative B (target) is 7 % higher than the expected share which represents statistically significant decoy effect ($\chi^2 = 5.56$; df = 1; $\alpha = 0.05$). However, the computed effect size can be considered as negligible ($\Phi = 0.08$).

Figure 3 shows the variants of pictorial descriptions and the number of times they were chosen by the respondents in total and based on the three types of available alternatives. It can be concluded that less than 100 times the chosen alternative lacked the image in description. On the other hand, the chosen alternative was most often accompanied by type C image (260 times), followed by type A image (252 times). From the three specific images, type B image was included in the description of the chosen alternative in the least number of cases (227 times).

Figure 3: Respondents' choices distribution based on the image type and alternative



Source: own calculation

Besides the total number of times the certain image type was chosen, it can be noticed that alternative A (competitor) was chosen by respondents approximately about 135 times whether image type A, B or C was included in its pictorial description. However, the target alternative

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B was less likely chosen when it was accompanied with type B image in comparison to the type A and C.

Therefore, next it was tested whether there was any significant difference in the distribution of choices based on the types of pictorial description of the alternative. The results in Table 4 are divided according to the group treatment, namely whether the respondents were choosing with decoy absent or present in the choice set.

According to the results of Chi-squared statistics, there is no relationship between the type of pictorial description and the respondent's choice whether decoy was absent ($\chi 2 = 5.27$; df = 3; $\alpha = 0.05$) or present ($\chi^2 = 4.07$; df = 6; $\alpha = 0.05$). And it is not possible to accept the set hypothesis, therefore it can be concluded that the image type does not directly influence the choice of alternative for the examined product category.

Table 4: Distribution of choices based on the pictorial description of the alternatives

Chosen alternative	No image	Type A	Type B	Type C	$\chi 2$
No decoy set:					
A	30	71	73	79	
B	15	48	31	55	5.2669
Decoy set:					
A	23	68	65	56	
B	19	56	46	54	
C	2	9	12	16	4.0725

Source: own calculation

4 Discussion

Based on the presented results, the respondents' choices were influenced by the decoy effect which was statistically significant in the tested condition of variable image type as opposed to non-significant decoy effect reported by Kubalová and Klepek (2022) when the image in survey design was fixed. However, the respondents did not specifically prefer certain alternative based on the image type as the current study found no evidence of the image type directly influencing the choice of alternatives whether the choice set included the decoy or not.

Due to these findings, it is disputable whether it is the actual variable image in the study design that allowed for the decoy effect to be detected in this case. Other possible explanation is the statistical power and total sample size which is larger in the current study (n = 959) as opposed to the examined total samples in the original study ($n_1 = 420$; $n_2 = 630$). Given the post-hoc power analysis results, the sample in this case accounts for higher power of statistical test ($1-\beta = 0.87$) and hence, it was possible to detect the effect of small size ($w = 0.1$), whereas in the original study the power of statistical tests was lower for the smaller samples and therefore unable to detect the statistical effect of the small size.

Given the distribution of the choices, the current results do not support the claims of Frederick, Lee and Baskin (2014) or Yang and Lynn (2014) that the qualitative characteristics moderate the decoy effect as there is no evidence that the decoy effect would influence the choices differently based on the absence and presence of the image in the product description as seen in Table 3. However, it is important to note the difference in the study design of using only qualitative information in the product description as opposed to both numerical and pictorial information together as in this case which is tied to the different products used. Given the type

of the product that was used in this scenario, washing machines, omitting quantitative characteristics of the product from the decision-making seems unrealistic and could lower the ecological validity of the experiment.

There are two main limits when it comes to the generalization the results or their implications for the business in the real world conditions. 1) Only one type of product was tested and limited number of attributes was present when consumers were making their choice. However, the importance of the product image can differ significantly based on the product type that is being examined which prevents generalisation of the results across the products. For example, the washing machines' physical features are often more similar between the brands and less important to the consumer than physical features of other products such as fashion items for which visual features might be more important than utilitarian features. 2) The choices made by respondents were hypothetical, followed by no consequences of their choices in terms of payment, product usage, etc. While it can be concluded that consumers can evaluate which alternative they like the best from the set even without the actual purchase, there might be scepticism towards the fact whether the respondents would still choose the alternatives if followed by the economic consequences. While this is an important limit for the real-world application of the decoy effect, it is less of a limit for comparison of the results with the previous findings in literature which used the same method.

Conclusion

Nowadays with the growing share of online purchases, the sellers are in full charge of the product presentation, providing as much information as possible as well as product images since customers can mainly rely on their sight during the online shopping. Therefore, the findings in literature about qualitative information such as images weakening the contextual effects might be bad news for the marketers who are hoping to use context effects such as decoy effect to boost their sales.

Tied to the previously reported failure to detect the decoy effect by Kubalová and Klepek (2022), the current paper examined the very same decoy effect scenario under the condition of variable image in the study design to find out whether the respondents show preference towards the chosen alternative based on the visual presentation of the alternative. In the study design, three possible variants of image or no image at all were randomly assigned to the alternatives of washing machines that respondents were choosing from in the online survey experiment.

The analysis of obtained results representing hypothetical choices of 959 respondents confirms a positive decoy effect in this experimental condition of variable images. However, the results might be less optimistic in real-world decision-making that involves actual purchases as one of the limits of the study lies in the hypothetical choices of respondents. Also, there was found no evidence of direct relationship between the image type and the respondents' choices. The difference in detection of the decoy effect could be caused by larger sample in the current study which have made the statistical test more powerful to detect the effect.

From the practical view, the image of specific product is always fixed, and it is not possible to make the product image a variable factor during real-life purchases as in the study design. Hence, the presented results could mean the practitioners might use the decoy effect for this product category as no evidence was found the product appearance would influence the consumers' choices more than the numerical characteristics of the product or the decoy presence. Although, the presented findings are not in line with the previously mentioned studies of Frederick, Lee and Baskin (2014) or Yang and Lynn (2014), this paper presents only one

case and one product category that was examined which is one of the limits as the results cannot be generalized for all other product categories. The presented results could be explained by the utilitarian type of the product category itself as most washing machines usually have similar physical features, shapes and colours and its physical appearance might not be the most important factor for the consumers. There might be different kinds of products for which the image and physical features might impact the consumer choice more.

The results of this paper imply that the sellers and designers of e-shops might be indeed able to boost their sales using the decoy effect in the case of washing machines and its numerical attributes unlike some other products where consumers rely more on pictorial and other qualitative features of the product they are considering to buy as pointed out by previous findings in the literature. Examining the role of graphical and other qualitative features on the decoy effect for other types of products, both hedonic and utilitarian, could be the focus of further research.

References

[1] AHN, H. and N. V. NOVOA, 2016. The decoy effect in relative performance evaluation and the debiasing role of DEA. *European Journal of Operational Research*, **249**(3), 959-967. ISSN 0377-2217.

[2] COHEN, J., 1988. *Statistical Power Analysis for the Behavioral Sciences*. 2nd ed. Hillsdale: Lawrence Erlbaum Associates. ISBN 0-8058-0283-5.

[3] FREDERICK, S. and L. LEE, 2008. Attraction, Repulsion, and Attribute Representation. In: A. Y. Lee and D. Soman, eds. *NA - Advances in Consumer Research Volume 35*. Duluth: Association for Consumer Research, pp. 122-124. ISBN 0-915552-61-2.

[4] FREDERICK, S., L. LEE and E. BASKIN, 2014. The limits of attraction. *Journal of Marketing Research*, **51**(4), 487–507. ISSN 0022-2437.

[5] HUBER, J., J. W. PAYNE and C. PUTO, 1982. Adding Asymmetrically Dominated Alternatives: Violations of Regularity and the Similarity Hypothesis. *Journal of Consumer Research*, **9**(1), 90-98. ISSN 1537-5277.

[6] KUBALOVÁ, R. and M. KLEPEK, 2022. Brand Presence in Decision-Making Involving Decoys. *Market-Tržište*, **34**(1), 9-24. ISSN 0353-4790.

[7] KUNCEL, N. R. and J. A. DAHLKE, 2020. Decoy effects improve diversity hiring. *Personnel Assessment and Decisions*, **6**(2), 31-37. ISSN 2377-8822.

[8] MISHRA, S., U. N. UMESH and D. E. STEM, 1993. Antecedents of the attraction effect: An information-processing approach. *Journal of Marketing Research*, **30**(3), 331-349. ISSN 0022-2437

[9] MONK, R. L., A. W. QURESHI, T. LEATHERBARROW and A. HUGHES, 2016. The decoy effect within alcohol purchasing decisions. *Substance Use & Misuse*, **51**(10), 1353-1362. ISSN 1532-2491.

[10] PITTARELLO, A., M. CASEROTTI and E. RUBALTELLI, 2020. 'Three is better than two': Increasing donations with the attraction effect. *British Journal of Psychology*, **111**(4), 805-822. ISSN 2044-8295.

[11] SHERLIN, I., F. SISWADHI and E. SARMIGI, 2020. Analysing the Decoy Effect on Online Product Purchasing Preference: an experimental study. In: *6th Annual International Conference on Management Research 2019*, pp. 125-130. ISSN 2352-5428.

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DOI: 10.25142/aak.2023.003

[12] XIAO, Q., S. ZENG and G. FELDMAN, 2021. Revisiting the decoy effect: Replication and extension of Ariely and Wallsten (1995) and Connolly, Reb, and Kausel (2013). *Comprehensive Results in Social Psychology*, **4**(2), 164-198. ISSN 2374-3611.

[13] YANG, S. and M. LYNN, 2014. More Evidence Challenging the Robustness and Usefulness of Attraction Effect. *Journal of Marketing Research*, **51**(4), 508-513. ISSN 0022-2437

[14] WU, C. and K. COSGUNER, 2020. Profiting from the Decoy Effect: A Case Study of an Online Diamond Retailer. *Marketing Science*, **39**(5), 974-995. ISSN 1526-548X.