„Sorry, We Are Fully Booked!” –
An Experimental Study of Preference Formation through Unavailable Services

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Abstract

„Sorry, We Are Fully Booked!” –

An Experimental Study of Preference Formation through Unavailable Services*

Services are sometimes unavailable, because capacity is limited in many service industries. The most attractive offers may already be gone by the time consumers make their actual buying decision. As a consequence, they only find a less attractive choice set. Classical choice models suggest that irrelevant alternatives should not influence choice. However, past research showed that they still have an effect on consumer preference formation. In this paper, we examine three aspects of unavailable services and their influence on consumer decision making: First, we argue that preference formation may depend upon the characteristics of the unavailable alternatives compared to the remaining services. Second, service providers can affect the decision context by revealing information about the unavailability at different stages of the decision process. Third, consumers’ perceptions about the causes for the unavailability could also affect the decision context. We investigate the impact of these factors on preference formation in two experimental studies. Results show that the perceived responsibility for the unavailability has the highest impact on the perceived attractiveness of the remaining alternatives.

JEL-Classification: M31

Keywords: Preference formation, unavailability, services, experiment

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1 Introduction

Services are sometimes unavailable, because capacity is limited in many service industries: Hotels are fully booked, restaurant seats are occupied, and telephone line capacity is exhausted. In particular, the most attractive offers may already be gone by the time consumers make their buying decisions. It is actually an everyday experience that services are sometimes unavailable. Making a reservation for a hotel room on the Internet is a prominent example. Several suppliers (e.g., expedia.com; orbitz.com) present available as well as unavailable hotels as response to a booking request. In many cases, the unavailable hotels are those that are particularly attractive. For that reason, these hotels are fully booked first and therefore at least sometimes not available at the time the buying decision is made. As a consequence, consumers can only choose from a less attractive set of alternatives. The same situation occurs when the supplier offers a highly attractive alternative that is actually not available. Hotels are sometimes closed for a certain period of time due to renovations. If the supplier still displays these offers, the potential customers end up with a less attractive choice set after the upcoming construction work is apparent. From the service provider’s point of view, the relevant question therefore is whether unavailable services have an effect on consumer preference formation among the remaining alternatives.

In this paper, we consider three aspects of unavailable services: First, preference formation for the available services may depend upon the characteristics of the unavailable alternatives. Therefore, we investigate the effects of different positions of unavailable services in the attribute space. In particular, we compare positions in which the unavailable service differs from the available alternatives on only two given attributes with situations in which the unavailable service is differentiated on an additional attribute. Second, service providers can affect the choice context by revealing or hiding information about the unavailability. If consumers are not aware of the unavailability by the time they make their buying decisions, they may show preference patterns different from those that would result, if they were informed about the unavailability right away. Third, from the consumers’ point of view, the actual reason for the unavailability could also affect the decision context. There is a variety of different reasons that can cause unavailability like personal, technical, legal, and social restraints (Eleftheriadou 2004). However, in this study, we do not merely focus on the objective reason for the unavailability, but rather on the subjective attribution of the unavailability. For that reason, we differentiate between situations in which the service provider is made responsible for the unavailability and situations in which the unavailability is attributed to the consumer. We consider all three aspects of unavailable services and investigate their impact on preference formation in two experimental studies.
2 Related literature

Classical choice models suggest that unavailable alternatives or alternatives that are dominated by other alternatives should be irrelevant for the consumer choice. Based on the basic assumption of independence of irrelevant alternatives (IIA) they should not have any impact on the choice probability of the available alternatives (Luce 1959; McFadden 1974; Ben-Akiva/Lerman 1985). IIA states that choice between two options should be independent of the existence and availability of other options. However, a branch of literature points out that irrelevant alternatives actually do have an impact on consumer preference formation. It is not at all clear-cut, however, whether these effects are positive or negative for service providers. In this context, a number of experimental studies deal with decoys and phantoms. Decoys are real alternatives that are actually available, but are typically dominated by at least one alternative offer in the choice set (Huber/Payne/Puto 1982; Huber/Puto 1983; Ratneshwar/Shocker/Stewart 1987). For that reason, no consumer should actually buy a decoy. In addition, according to IIA, decoys should not have an impact on consumer preferences and on the choice probability of the remaining alternatives (Aaker 1991).

However, the experiments show that decoys may bring about an attraction effect that makes the dominating alternative look even more attractive. There are a number of different explanations for this attraction effect (Huber/Payne/Puto 1982; Huber/Puto 1983; Mishra/Umesh/Stem 1993; Gierl/Eleftheriadou 2003). The reasons for the attraction effect include increased attention for the dominating option, because the dominating alternative is typically positioned closest to the decoy, whereas other alternatives are relatively different (Huber/Payne/Puto 1982; Huber/Puto 1983). Range effects can also explain the attraction effect. A decoy increasing the range of one attribute dimension is expected to decrease the importance of differences between alternatives on that dimension. Hence, the dominating alternative is more likely to be chosen even if there are options which are superior on one dimension. Increased attention for the dominating alternative can also result from frequency effects. These effects occur when more items are positioned along the dimension on which the dominating alternative is superior relative to other alternatives. This results in an increase of the weight of that dimension. The attraction effect has been identified in a number of experimental studies, and it is fairly well understood under which circumstances and to what extent this effect can be expected (e.g., Huber/Payne/Puto 1982; Huber/Puto 1983, Ratneshwar/Shocker/Stewart 1987; Mishra/Umesh/Stem 1993; Malaviya/Sivakumar 1998, 2002; Gierl/Eleftheriadou 2003).
While decoys, which are dominated by a services providers’ offer, can be used to increase the attractiveness of that offer, the effects resulting from so-called phantom alternatives are not that straightforward. Phantom alternatives are “illusionary choice options” (Farquhar/Pratkanis 1993, p. 1214). A phantom looks real, but is unavailable at the time the buying decision is made (Pratkanis/Farquhar 1992; Farquhar/Pratkanis 1993; Highhouse 1996; Doyle/O’Connor/Reynolds/Bottomley 1999; Gierl/Eleftheriadou 2004). In contrast to decoys, phantoms are not necessarily dominated choice options. They can be positioned anywhere in the attribute space. However, in everyday life the most attractive alternatives are usually the ones that run out of stock or are fully booked at first. Therefore, it is most interesting to investigate phantoms that dominate at least one alternative.

3 Theoretical framework

This piece of research focuses on unavailable services that are dominant relative to a target service (T), but are not dominant relative to a competitor service (C). Therefore, we apply the often-used framework in which two services are positioned in an attribute space according to figure 1. Figure 1a shows possible positions for a phantom P in a two-dimensional attribute space. Since T is the target service, we only investigate positions in the gray shaded area that are dominant positions relative to T.

Figure 1: Theoretical Framework

In several experimental studies dealing with phantom alternatives, the attraction effect has been identified (e.g., Pratkanis/Farquhar 1992; Highhouse 1996; Gierl/Eleftheriadou 2004). However, the reasons for these observed attraction effects can not be as easily explained. In contrast to decoys, range and frequency effects lead to a decrease of the attractiveness of the target if it is dominated by a phantom (Pratkanis/Farquhar 1992;
Hence, other reasons must account for attraction effects. One such explanation is a shift in the relative importance weights given to the attribute dimensions (Pratkanis/Farquhar 1992; Potter/Beach 1994). The attribute-importance effect can even lead to a consideration of new criteria in decision-making (Pratkanis/Farquhar 1992). Consumers might also use the phantom alternative as a reference point resulting in an overestimation of the losses and an underestimation of the gains when forced to choose a less-preferred alternative (Highhouse 1996). However, the intensity of the mentioned effects varies greatly depending on the position of the phantom alternative relative to the target and the competitor (Eleftheriadou 2004).

Therefore, for miscellaneous phantom positions, the relative impact of the different-and partly contrary-effects needs to be assessed (Eleftheriadou 2004). Most experiments with phantoms use similar attribute spaces, but usually focus on dominated positions. Gierl/Eleftheriadou (2004) point out that phantoms can be positioned anywhere in the attribute space and the most relevant phantom positions are those in which the phantom dominates the target. In that case, we deal with highly attractive alternatives that can be expected to be sold out first and therefore be sometimes unavailable. Hence, decoys are dominated alternatives that should not be chosen by the consumers, but phantoms are dominating alternatives that cannot be chosen by the consumers.

On the other hand, the influence of phantoms on the attractiveness of the remaining product alternatives not only depends on the position of the phantom but also on the reasons for the unavailability of the phantom (Pratkanis/Farquhar 1992). Unavailability of services can be caused by the supplier or by the customer. Supplier caused unavailability could be due to limited capacities, whereas customer caused unavailability could occur if the consumer hesitated too long and finally missed out on the most attractive alternative.

However, actual responsibility for the unavailability might not be the crucial factor determining the effects of phantoms on consumer preferences. Rather, consumers’ perceptions of the causes of unavailability seem to be central to consumer behavior. Attribution theory is concerned with all aspects of how people make causal inferences and what the consequences of these inferences are (Weiner 1985; Folkes 1988). Attribution about responsibility and stability (whether the consumer perceives the outcome to emanate from a stable cause) have been found to be most salient for understanding consumer behavior (Weiner 2000). Responsibility incorporates the question of who caused the outcome (locus of causality) as well as the degree of control the causal party had on the circumstances (Tsiros/Mittal/Ross 2004).

In addition, attributional research revealed motivational or esteem related biases leading to the tendency to attribute good outcomes to one’s self (internal causes) and bad outcomes to others (external or situational causes) (Folkes 1988). The unavailability
of the phantom as most attractive alternative represents a bad outcome. Therefore, in case of supplier caused unavailability, consumers can be expected to attribute unavailability to the supplier. This might arouse reactance leading to an increase of the perceived desirability of the favorable phantom, like the proverbial “forbidden fruit” (Lynn 1992; Pratkanis/Farquhar 1992; Farquhar/Pratkanis 1993). Thereby, the relative desirability of the target is decreasing.

In case of customer caused unavailability, for example because the customer postponed booking too long, consumers might still not attribute the unavailability to themselves. However, they might also realize that the supplier is not responsible for the negative outcome and therefore attribute it to a situational cause (Folkes 1988). In such cases, consumers are not very likely to show reactance. Rather, they are expected to show consistent behavior, because they can be expected to interpret unavailability as “bad luck”. There should be no shift in the perceived desirability of the phantom as well as the target. Therefore, we would not expect the customer to show significant dissatisfaction with the service provider that could reduce the attraction effect. Hence, negative effects on the attractiveness of the target should be stronger in case of supplier caused unavailability than for customer caused unavailability.

H₁: Supplier caused unavailability has higher (negative) impact on preference formation than customer caused unavailability.

Eleftheriadou (2004) presents a study that investigates dominating positions in a two-dimensional attribute space considering product announcements, legal, social, technical, and spatial restraints. However, little, if anything, is known about the preference formation effect that results from deviating positions on a third dimension. Research exists, though, on the effects of different positions of phantoms on a third attribute (Gierl/Eleftheriadou 2004). Gierl/Eleftheriadou (2004) find a significant positive impact on T, when the phantom is positioned close to T on the new attribute. Far phantoms, on the other hand, bring about a negative impact on T.

However, in these studies either two dimensions or three dimensions were investigated. The direct comparison of the impact of phantoms that dominate the target on an additional attribute versus phantoms that are dominant on a given attribute has yet to be done. To the best of our knowledge this effect has not yet been analyzed in the context of phantoms.

In this article, we directly compare the impact of phantoms that dominate the target on a third dimension versus given attributes phantoms. This situation is shown in figure 1b. P now dominates T on a dimension that is seemingly not relevant for the decision between T and C. We therefore analyze the impact of an irrelevant alternative, which is dominating T on an irrelevant attribute (Desai/Ratneshwar 2003). In our terminology
these phantoms are additional attribute phantoms. In contrast to Gierl/Eleftheriadou (2004) we consider the irrelevant attribute not to be a new attribute that only comes into play, if a phantom is presented. In our study, all presented alternatives are positioned in a three-dimensional attribute space in which the dominant alternative only uses an additional attribute in order to differentiate from the target and the competitor. However, the given attributes phantoms are also described on three dimensions, even if the attribute levels on the third dimension are the same for all three alternatives.

According to the studies of Gierl/Eleftheriadou (2004) a given attributes phantom can capitalize on the range effect that shifts preferences towards the target, even if it is positioned far from T. On the other hand, the positive impact of an additional attribute phantom may reverse the further P is positioned from T. Therefore, we hypothesize that an additional attribute phantom is more likely to lead to a negative impact on the preferences for T than a given attributes phantom, which can be expected to bring about a positive effect:

\[ H_2: \text{Given attributes phantoms have higher (positive) impact on preference formation than additional attribute phantoms.} \]

Concerning the information about the unavailability, we consider two different situations. If consumers know that certain alternatives are actually not available, they could basically neglect them in the decision-making process. However, past research shows that unavailable alternatives can make other alternatives look even more desirable (Slaughter/Sinar/Highhouse 1999). Therefore, we should expect an attraction effect, if customers are informed about the unavailability in the first place. On the other hand, it has been shown by Potter/Beach (1994) that late revelation of the unavailability forces customers to revise their decision, thereby shifting the attribute weights or focusing on attributes that were of less importance before. Late revelation of unavailability may also bring about psychological reactance. If the customer feels that his or her freedom of choice is reduced due to the revelation of the unavailability, the attractiveness of the unavailable alternative could be derogated (Pratkanis/Farquhar 1992). The study by Gierl/Eleftheriadou (2004) shows some evidence that known phantoms (early revelation of unavailability) have a higher impact on preference formation than unrecognized phantoms (late revelation of unavailability). We adopt this hypothesis and test it together with \( H_1 \) and \( H_2 \):

\[ H_{3a}: \text{The impact on preferences hypothesized in } H_1 \text{ is higher in case of early revelation than in case of late revelation of unavailability.} \]

\[ H_{3b}: \text{The impact on preferences hypothesized in } H_2 \text{ is higher in case of early revelation than in case of late revelation of unavailability.} \]
4 Experimental study

4.1 Design

In order to test the hypotheses, we conducted a study with two experiments. Hypotheses H₁ and H₃a were tested in experiment 1. In experiment 2 we tested H₂ and H₃b. The experimental designs presented in figure 2 are based on the work of Eleftheriadou (2004) and Gierl/Eleftheriadou (2004). In experiment 1 we only focused on an additional attribute phantom. This phantom P dominated the target on attribute 3, but was similar to T on two given attributes 1 and 2. The customer versus supplier caused unavailability condition was investigated in both information conditions (early versus late revelation).

Figure 2: Experimental designs

Therefore, the information revelation was crossed with the different reasons for unavailability. As can be seen from table, four experimental conditions were created for a between-subjects design. In addition, a control condition was created in which only the target and the competitor were presented, but no phantom. Table 2 shows the experimental groups in experiment 2 in which hypotheses H₂ and H₃b were tested.

<table>
<thead>
<tr>
<th>Information</th>
<th>EG1 (k/s)</th>
<th>EG2 (k/c)</th>
<th>EG3 (u/s)</th>
<th>EG4 (u/c)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reason</td>
<td>known</td>
<td>known</td>
<td>unrecogn.</td>
<td>unrecogn.</td>
</tr>
<tr>
<td>Attribute</td>
<td>supplier</td>
<td>customer</td>
<td>supplier</td>
<td>customer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>additional</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Experimental groups in experiment 1

<table>
<thead>
<tr>
<th>Information</th>
<th>EG1 (k/3)</th>
<th>EG3 (u/3)</th>
<th>EG5 (u/2)</th>
<th>EG6 (k/2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reason</td>
<td>known</td>
<td>unrecogn.</td>
<td>unrecogn.</td>
<td>known</td>
</tr>
<tr>
<td>Attribute</td>
<td>additional</td>
<td>additional</td>
<td>given</td>
<td>given</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>supplier</td>
<td>caused</td>
</tr>
</tbody>
</table>

Table 2: Experimental groups in experiment 2
Since only supplier caused unavailability was considered and the characteristics of the phantom were exactly the same as in experiment 1, the experimental groups EG1 and EG3 were identical in both experiments. In addition, experimental groups EG5 and EG6 were created by crossing the different information conditions with a given attributes phantom P*. Consequently, the overall study contained six experimental groups and one control group.

4.2 Stimuli

For the study, we chose a product category that we expected our sample to be familiar with. Respondents were asked to evaluate a number of competing hotels in a given summer holiday destination. Hotels were described on three attributes, and for all three dimensions three attribute levels were modelled. The attributes were derived from a pre-study using elicitation technique. Price was eliminated as an attribute to prevent price-quality inferences. Attribute 1 was framed as the location of the hotel, which was substantiated by the distance to the beach and the town center (both measured in walking minutes). The different attribute levels were framed close, medium and far. Room and property amenities were used as attribute 2. To create a realistic decision context the amenities were highly elaborated (room facilities, restaurant, pool, etc.). That allowed creating a basic, a superior and a deluxe attribute level. In the same way, the recreational and leisure activities (sightseeing tours, surf and scuba diving courses, mountain biking, etc.) were manipulated, which were used as attribute 3. Out of the 27 possible combinations of attribute levels we chose T, C, P and P* for the experiments according to figure 2. Based on the neglected alternatives a conjoint design was developed in order to estimate relative importance weights indirectly. These results will be presented elsewhere. In a series of pretests it was made sure that respondents were familiar with the decision context and the attributes were both relevant and meaningful to them. The pretests also confirmed that manipulations on all three attributes worked properly. Higher attribute levels (lower in case of location) were perceived to be more attractive on all three attributes. Finally, attribute levels were created in a way such that subjects in the control condition were approximately indifferent between the target and the competitor on average. Pretests showed that market shares were evenly distributed.

In order to manipulate the responsibility for the unavailability, subjects in the customer caused unavailability condition were told that they hesitated too long to make a reservation and eventually the hotel was fully booked. Subjects in the supplier caused unavailability condition got the information that the supplier was having the hotel renovated and therefore it was closed for a certain period of time. In the late revelation condition, the unavailability was only revealed after subjects had made an initial choice among the three hotels. In the early revelation condition, this information was given right away.
4.3 Dependent measures

As dependent measures, we used perceived similarity, attractiveness and choice. Perceived similarity was measured on a seven-point scale from “not at all similar” to “very similar”. This measure allowed controlling whether our manipulation worked out properly, since we intended the phantom to be positioned closer to the target than to the competitor. Attractiveness was also measured on a seven-point scale from “not at all attractive” to “very attractive”. In addition, subjects were forced to make a decision between the two or three alternatives, respectively. In the known phantom condition (early revelation), respondents could only choose among the two available hotels. In the unrecognized phantom condition (late revelation), respondents had to make a decision among the three hotels in a first step. Then the choice set was reduced to the two available hotels. In the second step, subjects had to make a final decision between the two available hotels. Finally, subjects were asked to express their satisfaction with the information about the availability (timing and reason) of the services on a seven-point rating scale from “not at all satisfied” to “extremely satisfied”.

4.4 Procedure

Subjects were 266 students at the University of Bayreuth/Germany. They were randomly assigned either to the control group or one of the six experimental groups, respectively. The study was conducted in three parallel sessions and it was presented as an empirical study on hotel preferences. Respondents had to fill out a written questionnaire that consisted of several parts. In the first part, the hotel descriptions were given and respondents had to evaluate the similarity of the hotels, judge the attractiveness and make a choice among the presented hotels. Early revelation groups were told right at the beginning that one of the alternatives was not available. Thus, they could judge the attractiveness of all three hotels, but only choose between two available alternatives. Late revelation groups first had to judge the attractiveness and make a choice among all three hotels. Only after this part was finished, subjects were allowed to go on with the questionnaire. The second part of the questionnaire was sealed to make sure that respondents in the late revelation condition only got the information about the unavailability after they had made an initial choice. They were then told that one of the hotels was actually not available, so they had to go through the decision-making process again with the two remaining alternatives. Again, subjects were asked to judge the attractiveness of the available hotels and decide on which hotel to choose. Respondents in the known phantom condition were presented some filling tasks in this part of the questionnaire in order to level the total processing time across the different conditions. The remaining parts of the questionnaire were related to different studies.
5 Results

5.1 Experiment 1

The results of the study’s two experiments will be discussed consecutively. As can be seen from table 3, there are no highly significant differences in the perceived similarity between the three hotels across the control group and the four experimental groups in experiment 1. This result does not come as a surprise, because the presented competitor and target were identical for all five groups and all four experimental groups were presented the same phantom with identical characteristics. However, interpreting results on a weaker significance level shows differences between phantoms depending on the information about and the reason for unavailability. In particular, the pairwise similarity between the competitor and the phantom tended to be higher in the known phantom conditions (groups 1 and 2) than in the unrecognized phantom conditions (groups 3 and 4). Thus, knowing that one alternative is actually not available seems to increase the perceived similarity with an available alternative. Overall, the manipulation worked properly. Target and phantom ($\mu = 5.00$) are perceived to be closer positioned than competitor and phantom ($\mu = 2.89$), which was intended ($t = 16.262; p < 0.001$).

<table>
<thead>
<tr>
<th>Similarity (pairwise)</th>
<th>Mean values (standard deviation)</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CG (k/s)</td>
<td>EG1 (k/c)</td>
</tr>
<tr>
<td>C/T</td>
<td>4.87 (1.12)</td>
<td>4.97 (1.08)</td>
</tr>
<tr>
<td>C/P</td>
<td>-</td>
<td>3.00 (1.23)</td>
</tr>
<tr>
<td>T/P</td>
<td>-</td>
<td>4.79 (1.46)</td>
</tr>
</tbody>
</table>

Table 3: Perceived similarities in experiment 1

For the analysis of the judgments on attractiveness in the different information conditions, we have to differentiate between the unrecognized and the known phantom conditions. Table 4 shows the judgments before and after the unavailability was uncovered. There is a highly significant difference in the attractiveness of T across the control group and the experimental groups 3 and 4 prior to the revelation of the unavailability. The attractiveness of T is perceived way lower in the experimental groups than in the control group. In addition, P has a high advantage over T that differs significantly from zero in both experimental groups ($t = 9.100; p < 0.001$ in EG3; $t = 6.526; p < 0.001$ in EG4). Thus, the phantom is actually perceived to be the most attractive alternative in the choice set. After the information about the unavailability was revealed, the differences in the attractiveness of T are only weakly significant ($F = 2.521; p < 0.1$). Compared to the pre-revelation condition the attractiveness of T has significantly increased in experimental group 3 ($t = 2.927; p < 0.01$) and group 4 ($t = 3.340; p < 0.01$).
Therefore, the attractiveness of T is boosted by the revelation of the information that the phantom is actually not available. However, the target is still perceived to be less attractive than in the control group. The attractiveness of C, on the other hand, does not differ significantly across the control group and the experimental groups, neither before nor after the unavailability has been revealed.

<table>
<thead>
<tr>
<th>Attractiveness (pre revelation)</th>
<th>Mean values CG and EG with unrecognized phantom (standard deviation)</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CG</td>
<td>EG3 (s)</td>
</tr>
<tr>
<td>C</td>
<td>4.42 (1.46)</td>
<td>4.03 (1.28)</td>
</tr>
<tr>
<td>T</td>
<td>4.84 (1.22)</td>
<td>3.68 (1.19)</td>
</tr>
<tr>
<td>P</td>
<td>-</td>
<td>5.84 (1.03)</td>
</tr>
<tr>
<td>P-T</td>
<td>-</td>
<td>2.16 (1.46)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attractiveness (post revelation)</th>
<th>Mean values CG and EG with unrecognized phantom (standard deviation)</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CG</td>
<td>EG3 (s)</td>
</tr>
<tr>
<td>C</td>
<td>4.42 (1.46)</td>
<td>4.26 (1.35)</td>
</tr>
<tr>
<td>T</td>
<td>4.84 (1.22)</td>
<td>4.21 (1.23)</td>
</tr>
</tbody>
</table>

Table 4: Attractiveness in experiment 1 (unrecognized phantom conditions)

The judgments of attractiveness in the known phantom conditions are shown in table 5. Since the unavailability is revealed right away in these conditions, respondents could judge the attractiveness only once. Like in the unrecognized phantom condition, we find weakly significant differences in the attractiveness of T (F = 2.925; p < 0.1).

<table>
<thead>
<tr>
<th>Attractiveness</th>
<th>Mean values CG and EG with known phantom (standard deviation)</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CG</td>
<td>EG1(s)</td>
</tr>
<tr>
<td>C</td>
<td>4.42 (1.46)</td>
<td>4.18 (1.35)</td>
</tr>
<tr>
<td>T</td>
<td>4.84 (1.22)</td>
<td>4.26 (1.25)</td>
</tr>
</tbody>
</table>

Table 5: Attractiveness in experiment 1 (known phantom conditions)

However, the results in the known phantom conditions hardly differ from those in the unrecognized phantom conditions. Though there are significant differences in the attractiveness of T, these are mainly due to the low perceived attractiveness in the supplier caused unavailability conditions of groups 1 and 3. An ANOVA of CG, EG1 and EG3
reveals significant differences among these groups ($F = 3.070; p < 0.05$). On the other hand, the attractiveness of T does not differ significantly between the control group and the experimental groups 2 and 4 in the customer caused unavailability condition ($F = 0.851$; n.s.). Therefore, we find support for $H_2$ in that supplier caused unavailability has a higher (negative) impact on preference formation than customer caused unavailability. In $H_{3a}$ we expected the impact of supplier caused unavailability to be even worse in the known phantom condition compared to the unrecognized phantom condition. The data does not support this hypothesis.

<table>
<thead>
<tr>
<th>Choice</th>
<th>Choice of T and C in CG and EG (in %)</th>
<th>$\chi^2$-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CG</td>
<td>EG1 (k/s)</td>
</tr>
<tr>
<td>T</td>
<td>50.0</td>
<td>57.9</td>
</tr>
<tr>
<td>C</td>
<td>50.0</td>
<td>42.1</td>
</tr>
</tbody>
</table>

$\chi^2 = 0.939$
$p = 0.913$

Table 6: Choice of T and C in experiment 1

Concerning the choice data in table 6, it is evident that the target was chosen more often in all four experimental conditions compared to the control condition. Thus, consumers’ awareness of a phantom leads to an increase of the choice of the target, even though subjects in the experimental groups perceived the attractiveness of T lower than those in the control group. However, the overall effect is far from being statistically significant.

5.2 Experiment 2

In experiment 2, we find significant differences in the perceived similarity between all three stimuli pairs across the control group and the four experimental groups. Table 7 shows that the differences in similarity are mainly due to the manipulation of the phantom position. In the conditions with additional attribute phantoms (groups 1 and 3) the similarity of competitor and phantom as well as target and phantom was perceived lower than in the conditions with given attributes phantoms (groups 5 and 6). For the manipulation check, we therefore matched the two additional attribute groups and the two given attributes groups, respectively. Like in experiment 1, the phantom is considered to be closer positioned to the target than to the competitor ($t = 12.667; p < 0.001$ in EG1 and EG3; $t = 16.893; p < 0.001$ in EG5 and EG6). Also, phantom and target are considered to be very closely positioned in the given attributes conditions, but significantly further away in the additional attribute conditions ($t = 5.654; p < 0.001$). Therefore, our manipulation results in a close phantom in the two-dimensional and a far phantom in the three-dimensional attribute space.
Table 7: Perceived similarities in experiment 2

The further data analysis follows the same pattern as in experiment 1. Again, we have to differentiate between the two information conditions. Table 8 shows the mean values of attractiveness in the unrecognized phantom conditions of groups 3 and 5 before and after the information about the unavailability was revealed. Before the revelation, the attractiveness of T differed highly significant across the control group and the experimental groups. Obviously, the attractiveness of T is lower than in the control group, but is particularly low in the additional attribute phantom condition of group 3. Again, the phantom has an advantage over T in both experimental groups that differs significantly from zero (t = 9.100; p < 0.001 in EG3; t = 8.338; p < 0.001 in EG5). Hence, the phantom is the most attractive alternative in the two-dimensional as well as in the three-dimensional attribute space. After the unavailability became apparent, the differences are still significant, but only on a weak 10% level. However, the post-revelation judgments of the attractiveness of T significantly increased in both experimental conditions (t = 2.927; p < 0.01 in EG3; t = 3.627; p < 0.001 in EG5).

<table>
<thead>
<tr>
<th>Similarity (pairwise)</th>
<th>Mean values (standard deviation)</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CG (k/3)</td>
<td>EG1 (u/3)</td>
</tr>
<tr>
<td>C/T</td>
<td>4.87 (1.12)</td>
<td>4.97 (1.08)</td>
</tr>
<tr>
<td>C/P</td>
<td>-</td>
<td>3.00 (1.23)</td>
</tr>
<tr>
<td>T/P</td>
<td>-</td>
<td>4.79 (1.46)</td>
</tr>
</tbody>
</table>

Table 8: Attractiveness in experiment 2 (unrecognized phantom conditions)
The judgments of attractiveness in the known phantom conditions show a similar pattern which is illustrated in table 9. We find significant differences in the attractiveness of T ($F = 3.781; p < 0.05$).

<table>
<thead>
<tr>
<th>Attractiveness</th>
<th>Mean values CG and EG with known phantom (standard deviation)</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CG</td>
<td>EG1 (3)</td>
</tr>
<tr>
<td>C</td>
<td>4.42 (1.46)</td>
<td>4.18 (1.35)</td>
</tr>
<tr>
<td>T</td>
<td>4.84 (1.22)</td>
<td>4.26 (1.25)</td>
</tr>
</tbody>
</table>

Table 9: Attractiveness in experiment 2 (known phantom conditions)

Particularly, the low attractiveness of T in the additional attribute condition of group 1 hardly differs from that in group 3. Concerning the attractiveness in the given attributes conditions, the mean values differ more across the control group and the experimental groups. In the unrecognized phantom condition, the attractiveness of T is lower than in the control group, whereas T is perceived more attractive compared to the control group in the known phantom condition. An ANOVA of CG, EG1 and EG3 reveals significant differences among these groups ($F = 3.070; p < 0.05$). However, an ANOVA of CG, EG5 and EG6 shows no significant differences ($F = 1.398; n.s.$).

Hypothesis $H_2$ is therefore only partially supported. Given attribute phantoms do not have a significant positive impact on the attractiveness of T. Additional attribute phantoms, on the other hand, have a negative impact on the attractiveness of T. Like in experiment 1, the manipulation of the information revelation does not increase the hypothesized effect in $H_2$. Hypothesis $H_{3b}$ is therefore also not supported.

<table>
<thead>
<tr>
<th>Choice</th>
<th>Choice of T and C in CG and EG (in %)</th>
<th>$\chi^2$-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CG</td>
<td>EG1 (k/3)</td>
</tr>
<tr>
<td>T</td>
<td>50.0</td>
<td>57.9</td>
</tr>
<tr>
<td>C</td>
<td>50.0</td>
<td>42.1</td>
</tr>
</tbody>
</table>

Table 10: Choice of T and C in experiment 2

The choice data shows a pattern similar to experiment 1. Again, the target is chosen more often in all four experimental groups compared to the control group. Though this effect goes in the expected direction, it is not statistically significant.
6 General discussion

Prior to our work, several researchers have investigated the attraction effect of decoys and phantoms (e.g., Huber/Payne/Puto 1982; Huber/Puto 1983; Rattaneshwar/Shocker/Stewart 1987; Pratkanis/Farquhar 1992; Farquhar/Pratkanis 1993; Mishra/Umesh/Stem 1993; Highhouse 1996; Gierl/Eleftheriadou 2003, 2004). These findings suggest that irrelevant alternatives are part of the decision context and can have an impact on the attractiveness of other alternatives. In the context of services, dominating alternatives are of particular interest. Based on existing research, we focused on three issues: First, we considered different reasons for unavailability. In particular, our interest was in the responsibility for unavailability as perceived by the customer rather than the objective reason for unavailability. Therefore, we conducted an experiment in which the impact of supplier caused versus customer caused unavailability was investigated. Second, we manipulated the characteristics of the unavailable alternative. Thus, the different effects of additional attribute phantoms and given attributes phantoms were compared in one experiment. Third, existing studies stress that the point in time at which the unavailability is uncovered can have an impact on preference formation. For that reason, both experiments were carried out under different information conditions.

6.1 Manipulated factors

Our findings show that supplier caused unavailability has a negative impact on the attractiveness of the target. Customer caused unavailability, on the other hand, does not affect the attractiveness of the target significantly. This result supports our hypothesis that consumers’ perception of the responsibility for the unavailability is central for his or her behavior. In case of supplier caused unavailability, the responsibility can be attributed to the supplier leading to the arousal of reactance. As a consequence, the target is perceived less attractive than in the case of customer caused unavailability. In the latter case, consumers show consistent behavior, because they attribute the responsibility for the unavailability to themselves or other contextual causes. This reasoning is supported by the inspection of subjects’ satisfaction with the information about the presented alternatives and their availability. Satisfaction was directly measured on a seven-point scale from “not at all satisfied” to “extremely satisfied”. For ANOVA we matched the known and the unrecognized phantom conditions. Satisfaction differs significantly across the control condition and the two different unavailability conditions (F = 10.472; p < 0.001). Subjects in the control group are highly satisfied ($\mu = 4.24$). The difference to the group with customer caused unavailability ($\mu = 3.74$) is not statistically significant. According to the results of Scheffe’s post-hoc test, only the mean difference to the condition with supplier caused unavailability is statistically significant (p < 0.001). Respondents in this group were the least satisfied ($\mu = 3.04$).
Concerning the characteristics of the unavailable alternative, our data support the hypothesis that additional attribute phantoms have a higher (negative) impact on the attractiveness of the target than given attributes phantoms. However, this result has to be interpreted with care. In our experimental design, we considered only one position in the two-dimensional and one position in the three-dimensional attribute space. The studies by Eleftheriadou (2004) and Gierl/Eleftheriadou (2004) deliver some evidence, that the relative position on either attribute can have a significant impact on preference formation. Also, Pratkanis/Farquhar (1992) point out that close phantoms have a higher impact than far phantoms. Though these studies do not explicitly compare additional attribute with given attributes phantoms, our results are somehow related to theirs. Since we did not manipulate the phantom positions on an additional or one of the given attributes, we are not able to tell whether the impact of the phantoms would have been different, if we had created phantoms in different proximities to the target. Nevertheless, perceived similarity can be interpreted as an indicator for the relative distance between target and competitor in the two-dimensional and three-dimensional attribute space. The additional attribute phantom was perceived significantly less similar to the target than the given attributes phantom. Considering the additional attribute phantom as a far phantom and the given attributes phantom as a close phantom, our results concerning attractiveness are consistent with previous studies. Still, the major drawback of our manipulation is that we are not able to differentiate whether perceptions of similarity differ due to the positioning in attribute spaces of different dimensionality or because of the chosen position on the respective attributes.

In addition, our findings are independent of the point in time at which the information about the unavailability is revealed. This result is in contrast to Gierl/Eleftheriadou (2004). They find a higher impact in case of known phantoms at least for some product categories. Since we only focused on one product category, we have to suppose that our result is product category specific and can not be generalized to other product categories or service industries. In particular, we would suspect that it depends on the particular service under consideration whether a simple numerical description or an elaborated verbal description is more appropriate for the presentation of the stimuli. If the description of the stimuli depends on the nature of the service, the attraction effect should also be category specific.

6.2 Preference formation

The choice data does not confirm that the experimental manipulations of the phantom increase the market share of the target due to an attraction effect. Though the target is chosen more often in all six experimental conditions compared to the control condition, the increase in market shares is not statistically significant. Again, this result could be
partly due to the fact that only one product category was considered in the study. On the other hand, as Ratneshwar/Shocker/Stewart (1987) point out, the attraction effect is likely to diminish the more familiar respondents are with the decision context and the more meaningful the attributes are elaborated.

Though we did not explicitly control for familiarity, we asked respondents for the number of their summer holidays within the past three years. On average, respondents had gone on summer holiday once a year during the considered three-year period ($\mu = 2.98$). About 60.3% had gone on summer vacation three or more times in the past three years. In addition, subjects were asked for the usual period of time they use to prepare for summer vacation starting with information gathering about potential destinations. On average, responding subjects start approximately eleven weeks in advance with their vacation preparations ($\mu = 10.83$). We therefore believe that hotel booking in a summer holiday destination is a category, which respondents in a student sample are highly familiar with. High familiarity may have reduced an otherwise stronger attraction effect.

A similar effect might have been caused by the description of the attribute dimensions and attribute levels. The meaning of a stimulus results from the subjects’ efforts to interpret the stimulus material. Elaboration refers to the quantity of information that is potentially available in the stimulus material. An appropriate elaboration of the ambiguous numerical attribute information helps to fix the meaning of the stimuli descriptors. Hence, a meaningful elaboration of the stimuli can be expected to lead to relatively context-free encoding of attribute values, thus diminishing the potential attraction effect (Ratneshwar/Shocker/Stewart 1987). The stimuli in our experiments were highly elaborated. Instead of presenting the room and property amenities on the usual five-star system, we verbally described the amenities (room facilities, restaurant, pool, etc.). In the same way, the recreational and leisure activities (sightseeing tours, surf and scuba diving courses, mountain biking, etc.) were presented. This verbal description may have affected the identified, though not significant, attraction effect in our experiments.

6.3 Limitations and future research

There are also some limitations to our study that need to be addressed. In the study, we investigated only one product category. In particular, we used competing hotels in a given summer holiday destination. We expected respondents in our student sample to be familiar with this decision context. In addition, it is a common experience that hotels are sometimes fully booked or closed for a certain period of time due to construction work. Similar limitations occur in many other service industries as well. However, investigating no more than a single product category allows generalizing the results only to a limited extent. The investigation of other service industries (e.g., credit cards, postal services, rental cars, etc.) must be left to future research.
The study is also limited by the small number of phantom positions that were considered. In experiment 1, we focused on different reasons for and information about the unavailability. For that reason, only one phantom position was created. Though we found no significant impact of the information manipulation, the attractiveness of the target was significantly affected by supplier caused unavailability. However, we can not rule out the possibility that the position of the dominating alternative interacts with the attribution of responsibility. These potential interaction effects can only be investigated in a more comprehensive design that crosses different phantom positions with different responsibilities for unavailability. In experiment 2, we compared the impact of an additional attribute phantom with the effect of a given attributes phantom. Hence, only two phantom positions were created. Again, the attractiveness of the target may not only be affected by the fact on which attribute the phantom differentiates from the target, but also by the specific position chosen on that particular attribute (Eleftheriadou 2004; Gierl/Eleftheriadou 2004). In order to scrutinize the interaction effect between these two impact factors, a larger experimental design is required.

Finally, our respondents were forced to make a final decision between the target and the competitor. This manipulation is similar to many experimental studies on decoys and phantoms. However, forcing subjects to choose from a very limited choice set after a very attractive alternative has been eliminated may bring about an artificial effect. As has been shown by Potter/Beach (1994), individuals may want to go through the entire decision-making process again after the unavailability of an attractive alternative is revealed. The decision may then be delayed until previously neglected alternatives have been evaluated, new alternatives have been found, or the preferred alternative is available again. Hence, there are two aspects that are left to future research. First, in contrast to the classic design with only one target and one competitor, the number of choice alternatives could be increased. This would certainly add some complexity to the decision contexts. On the other hand, a larger set of choice alternatives would also increase the number of phantom positions that can be of interest, because the number of dominated/dominating relationships between the alternatives is also increased. Second, the degree of unavailability can be manipulated in different ways. This aspect is closely related to the number of choice alternatives. Services may be available again later on in the decision process. In that case, consumers could delay the purchase decision and not choose among the restricted set of alternatives in the first place. In addition, consumers could take actions in order to circumvent the unavailability of a preferred alternative. In particular, they can consider formerly neglected alternatives or gather information about additional alternatives. These extensions would shed some light not only on the decision outcome, but also on the decision process consumers go through when they are confronted with unavailable services.


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