
Effects of price promotions on purchase intentions in post-promotion periods



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The objective of this study is to examine the effects of price promotions on consumers' purchase intentions. We want to show that purchase intentions in a period with no promotion are lower when consumers have previously had contact with a price promotion than when they have had no contact with a price promotion. In order to do so, we compare purchase intentions before contact with a price promotion, purchase intentions during the promotion period, and purchase intentions in the post-promotion period. In addition, we look at the psychological mechanisms underlying the observed effects. We examine possible effects through reductions of consumers' reference price and willingness to pay because these two distinct concepts represent the most important price beliefs in the considered context. The study results provide support for our basic assumption. The findings additionally show that the negative change of purchase intentions is directly linked to a reduction of willingness to pay and indirectly linked to a reduction of consumers' reference price after contact with a promotion.

Das Ziel dieser Studie ist es, Effekte von Preispromotionen auf Kaufabsichten von Konsumenten zu untersuchen und zu zeigen, dass die Kaufabsichten in einem Zeitraum, in dem es keine Preis-promotion gibt, geringer sind, wenn Konsumenten vorher Kontakt mit einer Preispromotion hatten (verglichen mit der Situation, dass Konsumenten keinen Kontakt mit einer Preispromotion hatten). Hierfür vergleichen wir Kaufabsichten vor dem Kontakt mit einer Preispromotion, Kaufabsichten in dem Zeitraum, in dem die Preispromotion stattfindet und Kaufabsichten nach Ende der Preispromotion. Wir analysieren zusätzlich die psychologischen Mechanismen, die zu den beobachteten Effekten führen. Wir untersuchen mögliche Effekte über die Reduktion des Referenzpreises und der Zahlungsbereitschaft von Konsumenten, da diese beiden Konstrukte die wichtigsten Preisvorstellungen im betrachteten Kontext repräsentieren. Die Ergebnisse der Studie bestätigen die Basisannahme und zeigen zusätzlich, dass der Rückgang der Kaufabsichten in direkter Beziehung zu einem Rückgang der Zahlungsbereitschaft und in indirekter Beziehung zu einem Rückgang des Referenzpreises nach dem Kontakt mit der Preispromotion steht.

Price promotions, Reference price, Willingness to pay, Purchase intention, Post-promotion effects.

Preispromotionen, Referenzpreis, Zahlungsbereitschaft, Kaufabsicht, Effekte nach Promotionsende.

1. Introduction

Price promotions temporarily reduce the regular product price in order to generate immediate positive consumer responses (Kumar/Leone 1988; Van Heerde et al. 2004). Price promotions can lead to higher purchase intentions (Alford/Biswas 2002; Grewal et al. 1998b; Gupta 1988), but can also have negative long-term effects on sales (Chandrashekar/Grewal 2003; Cheng/Monroe 2013; DelVecchio et al. 2007; Kalwani/Yim 1992) because consumers who purchase a product on promotion are likely to wait for future price promotions to make their next purchase (Kalyanaram/Winer 1995). Thus, when determining the overall effectiveness of a price promotion, it is not sufficient to simply look at effects in the price promotion period. Rather, possible future effects should also be analysed (Krishnamurthi et al. 1992; Mela et al. 1998; Santini et al. 2016).

The literature provides the notion that price beliefs are changed into the direction of external price information (Biswas/Blair 1991). As during a price promotion period, consumers are exposed to new, lower price information, it is important to understand the possible negative effects of price promotions on consumers' price beliefs in detail. Previous studies have shown that consumers reduce their reference price (e.g., Bambauer-Sachse/Dupuy 2012; Bambauer-Sachse/Massera 2015; Chandrashekar/Grewal 2006; Diamond/Campbell 1989; Grewal et al. 1998a; Lattin/Bucklin 1989; Kalwani/Yim 1992) as well as their willingness to pay (e.g., Krishna 1991; Palmeira/Srivastava 2013) for the promoted product after contact with a reduced product price. Consumers make these downward corrections because they perceive a discrepancy between their initial reference price and the new (lower) price information encountered (Biswas/Blair 1991). Consequently, they underestimate the regular product price (Liefeld/Heslop 1985). However, studies such as those cited above did not examine empirically the consequences of such reductions in terms of typical consumer response variables and did not specifically look at effects in post-promotion periods. In addition, previous research did not analyse the psychological mechanisms underlying such effects. Thus, previous research does not provide a comprehensive and simultaneous analysis of the whole chain of effects triggered by price promotions.

The purpose of this study is therefore to focus on reductions of purchase intentions in the post-promotion period. We want to show specifically that purchase intentions in a period with no promotion are lower when consumers have had contact with a price promotion than when they have had no contact with a price promotion. In order to do so, we compare purchase intentions before contact with a price promotion, purchase intentions during the promotion period and purchase intentions when the promotion is over. In addition, we aim to analyse whether these reductions are caused by two distinct psychological mechanisms: reductions of consumers' reference prices and reductions of willingness to pay. These two concepts represent the most important price beliefs in the considered context. Note that there are product categories with regard to which the majority of consumers have a reference price and there are other categories with regard to which consumers have no reference price. We are particularly interested in product categories where consumers regularly purchase products and have a certain price interest and consequently a reference price.

The study presented here extends previous research by focusing on reductions of consumers' *purchase intentions* in the post-promotion period. The study results provide the notion that price promotions have a persistent destructive effect on purchase intentions in

that purchase intentions in periods with no price promotion are lower after contact with a price promotion than purchase intentions in periods with no price promotion and no contact with a price promotion. In addition, our study results provide insights into the mechanisms underlying this effect. Such insights go beyond the results provided by previous studies. Thus, an important contribution of our study is to examine effects of promotions in post-promotion periods (i.e., when the product is no longer on sale) and not simply to look at the promotion period as in many previous studies.

Our study results provide marketers with detailed insights into the negative effects of price promotions in post-promotion periods that they should consider in addition to the positive effects in the promotion period they usually focus on. In addition, our results enable marketers to better understand the mechanisms underlying these negative effects and thus to take appropriate measures to attenuate such undesirable effects.

2. Background and hypotheses development

2.1 Empirical background

As explained above, previous studies did not examine the effects of price promotions on purchase intentions in post-promotion periods, i.e. when a product is no longer on promotion. However, some studies analysed the immediate effects of price promotions on price expectations, reference prices, and willingness to pay. As the results of these studies provide interesting insights into the basic effects of price promotions, we will discuss and link them to our research question in the following. *Kalwani/Yim* (1992) found that more frequent promotions lead to lower price expectations. The studies of *Bambauer-Sachse/Dupuy* (2012), *Bambauer-Sachse/Massera* (2015), *Chandrashekar/Grewal* (2006), *Diamond/Campbell* (1989), *Grewal et al.* (1998a), and *Lattin/Bucklin* (1989) provide the notion that exposure to price promotions leads to reductions in the reference price. The results presented by *Krishna* (1991) and *Palmeira/Srivastava* (2013) additionally show that contact with price promotions, particularly if such promotions are frequent, reduces consumers' willingness to pay.

These studies provide the notion that consumers perceive a discrepancy between their initial reference price and the new (lower) price information encountered (*Biswas/Blair* 1991) and consequently make a downward correction of their price beliefs related to a product category after contact with a price promotion. This is an important basic insight. However, these previous studies only provide results for partial effects that are of interest here, and neither examine effects on purchase intentions, particularly in post-promotion periods, nor analyse the psychological mechanisms underlying such effects. Starting from this point, we will develop hypotheses in the following and conduct an empirical study to test these hypotheses and close the identified gap.

2.2 Theoretical background and basic hypotheses

The first two hypotheses presented below mirror the basic effects of price promotions on purchase intentions (positive effects during the promotion period and negative effects in the post-promotion period). *H1* has already been examined in previous research and will be tested for reasons of completeness. We will also test this hypothesis to confirm the positive immediate effect of price promotions that we aim to contrast with possible negative effects. *H2*, which is directly related to our objective of examining the persistent destruc-

tive effects of price promotions in post-promotion periods, has not been examined in previous studies.

Price promotions aim to increase consumers' purchase intentions (Ailawadi/Neslin 1998; Grewal et al. 1998b; Sun 2005) for a temporary period of time (Blattberg et al. 1995). These positive short-term effects of price promotions can be explained as follows. When faced with a price promotion, consumers are attracted by the economic incentive and consider the saving a gain (Kalwani et al. 1990). Price promotions that display the regular price and the reduced price lead to higher purchase intentions because consumers pay significant attention to the difference between the two prices (Alford/Biswas 2002) and particularly to the reduced price when a percentage-off promotion is used (Bambauer-Sachse/Massera 2015). In addition, the perceived monetary sacrifice, which negatively influences consumers' purchase decisions (Dodds et al. 1991; Monroe 1990), is lower when a product is on promotion (Compeau/Grewal 1998). These arguments lead to:

H1: Consumers' purchase intentions related to the promotion price are higher than their purchase intentions related to the regular price before contact with the price promotion.

In addition to these positive effects, price promotions are likely to have negative effects on consumers' purchase intentions when the product is once again sold at the regular price in the post-promotion period as will be argued in the following. After contact with a price promotion, consumers tend to perceive the return to the regular product price as a price increase (Kalyanaram/Winer 1995). In general, price increases lead to negative consumer responses (Kalyanaram/Little 1994) in terms of reduced demand (Dodds et al. 1991; Monroe 1990). In the considered context, consumers are likely to show lower purchase intentions if they interpret the return to the regular price as a price increase. Furthermore, after contact with a price promotion, consumers tend to perceive the regular price as overpriced (Cheng/Monroe 2013). These arguments suggest that consumers exposed to the regular price in the post-promotion period are likely to be less willing to buy the product than they had been before their contact with the price promotion. These arguments lead to:

H2: Consumers' purchase intentions related to the regular price after contact with the promotion are lower than purchase intentions related to the promotion price and even lower than purchase intentions related to the regular price before contact with the price promotion.

2.3 The mechanisms leading to lower purchase intentions in the post-promotion period

The subsequently presented hypotheses cover possible mechanisms underlying the observed effect that purchase intentions related to the regular price are lower in post-promotion periods than in periods before the contact with the promotion. In order to derive these hypotheses, we first introduce the concepts of reference price and willingness to pay. Then, we discuss the relation between the reduction of consumers' reference prices and their willingness to pay. Finally, we hypothesise possible effects of reductions of consumers' reference prices and willingness to pay on purchase intentions.

Reductions of consumers' reference price and willingness to pay affect consumers' purchase decisions (Biswas/Blair 1991; Chang/Wildt 1994; Grewal et al. 1998a; Monroe 1990). The *reference price* is an internal price that results from the psychological process-

ing of price information (*Dickson/Sawyer* 1990). Consumers use this price as the reference against which they evaluate an encountered product price (*Cheng/Monroe* 2013). The reference price is related to either a particular product or a specific product category (*Cheng/Monroe* 2013) and changes over time through the inclusion of new price information (*Hamelin* 2000). The literature provides numerous conceptualisations of the reference price (*Hamelin* 2000; *Mazumdar et al.* 2005; *Vaidyanathan/Muehling* 1999). A systematic review of the various aspects used to describe or measure the reference price leads to the identification of three conceptual categories. The first category comprises encountered market prices (*Lattin/Bucklin* 1989; *Lowengart* 2002; *Rajendran/Tellis* 1994), such as the average market price (*Frankenberg/Liu* 1994; *Grewal et al.* 1998a; *Grewal et al.* 1998b; *Monroe* 1973), but also the minimum price observed, the maximum price observed (*Biswas/Sherrell* 1993; *Chandrashekar/Jagpal* 1995; *Monroe* 1990), and the last price paid (*Mayhew/Winer* 1992; *Rajendran/Tellis* 1994). In our study, we will only consider the average market price from this category because all other pieces of price information are unlikely to change after exposure to a price promotion, and this change is of specific interest here. Note that the last price paid changes if one compares a *real* purchase during a promotion to a purchase at the regular price. However, as it is not possible to consider real purchases, and as the study respondents were only asked to imagine that they encounter a particular price promotion but not that they have purchased the product at this price, it makes little sense to consider the last price paid. The second category consists of expectations of the future price (*Jacobson/Obermiller* 1990) measured in terms of the price expected for the next purchase (*DelVecchio et al.* 2007; *Kalwani/Yim* 1992; *Kalwani et al.* 1990; *Sinha/Smith* 2000). The third category comprises fair prices (*Chandrashekar/Jagpal* 1995; *Grewal et al.* 1998a; *Grewal et al.* 1998b; *Thaler* 1985) and just prices (*Thaler* 1985). Our study will also measure the price expected for the next purchase and the fair price.

The *willingness to pay* corresponds to the highest price consumers are willing to pay for a product based on the subjective value they assign to this product (*Johannesson et al.* 1997; *Kalish/Nelson* 1991; *Miller et al.* 2012; *Wertenbroch/Skiera* 2002). Consumers' willingness to pay can change when they are exposed to external price cues (*Nunes/Boatwright* 2004). Some authors consider consumers' willingness to pay a dimension of the reference price (*Bearden et al.* 1992; *Klein/Oglethorpe* 1987; *Lowengart* 2002; *Vaidyanathan/Aggarwal* 2001). However, the following arguments suggest that the reference price and willingness to pay are distinct concepts. The literature often describes the reference price as a multidimensional (*Hamelin* 2000) and unobservable (*Cheng/Monroe* 2013) construct, which is based on different pieces of price information (*Lowengart* 2002; *Rajendran/Tellis* 1994) and formed through the psychological integration of price cues (*Dickson/Sawyer* 1990). Consumers' willingness to pay is defined as a subjective estimation that consumers form based on factors not exclusively related to the price information (*Vaidyanathan/Muehling* 1999) and through a less complex process. In addition, the reference price and their willingness to pay play different roles in consumers' decision-making processes (*McCarville/Crompton* 1987). Consumers consider their reference price a perceptual anchor with which they compare encountered price information (*Cheng/Monroe* 2013; *Monroe* 1990). They use this comparison to judge the plausibility of the price information (*Monroe* 1990); this in turn determines how consumers assess the product benefits. These judgements lead to utility perceptions that determine consumers' willingness to

pay (Monroe 1990). Thus, willingness to pay is rather a reaction to a specific encountered offer (McCarville/Crompton 1987).

In the following we will derive the hypotheses on the relations between consumers' reduction of the reference price and of their willingness to pay, and purchase intentions. Although it might be better to have one single and well-founded theoretical basis for these hypotheses, the relation between the reductions of consumers' reference price and willingness to pay mirrors effects of one price-related concept on another price-related concept. Thus, this relation differs in its character from the relations between these two price-related concepts and purchase intentions. Therefore, different theoretical approaches are needed to explain the assumed effects. The contact with a price promotion leads to an adjustment of the initial reference price (Chandrashekar/Grewal 2003; Grewal et al. 1998a; Kalyanaram/Winer 1995; Yadav/Seiders 1998), which results in a reduced reference price related to the respective product category (Chandrashekar/Grewal 2006; Diamond/Campbell 1989; Grewal et al. 1998a; Lattin/Bucklin 1989). Applying adaptation level theory (Helson 1964) to the processing of prices helps explain this reduction in the reference price. According to this theory, people in general adjust their past beliefs by including new available stimuli. Such adjustments are usually based on heuristic processes on a subconscious level (Chandrashekar/Grewal 2003; Frankenberger/Liu 1994) and thus are likely to be insufficient (Epley/Gilovich 2006). Transferred to the considered context, we argue that consumers adjust their reference prices by integrating the promotion price through heuristic processes, resulting in a lower reference price. As reference prices are correlated with the prices consumers are willing to pay for a product (Ranyard et al. 2001), a reduction of the reference price is likely to lead to a reduction of consumers' willingness to pay (Nunes/Boatwright 2004), which, in the end, is lower than the regular product price (Folkes/Wheat 1995). The relation between consumers' reference price and their willingness to pay has been discussed theoretically in several papers (e.g., Blattberg et al. 1995; Krishna 1991; Taudes/Rudloff 2012), but not tested empirically in the contexts considered here. Thus, we formulate the following hypothesis:

H3: The stronger the reduction of consumers' reference price after exposure to a price promotion, the stronger the reduction of their willingness to pay.

Applying prospect theory (Kahneman/Tversky 1979) to the context considered here helps explain the effects of a reduction of consumers' reference price and willingness to pay on purchase intentions. Prospect theory suggests in general that losses are weighted more strongly than gains of the same magnitude. Applying this argument to the context considered here, we argue that consumers perceive the discrepancy between the regular (higher) product price in the post-promotion period and their reference price, which they have reduced after contact with the price promotion, as a loss. We further argue that this perceived loss is more important than the gain related to the reduced price during the promotion period. This gap between the perceived loss and the perceived gain increases with an increasing reduction of the reference price. Moreover, consumers who have reduced their reference prices after contact with a price promotion perceive the regular price as excessive (Kalwani/Yim 1992) and are much less willing to buy the product at the regular price again (Cheng/Monroe 2013; Kalwani/Yim 1992; Kalwani et al. 1990). These arguments lead to the following hypotheses:

H4: The stronger the reduction of consumers' reference price after exposure to a price promotion, the lower the purchase intentions related to the regular post-promotion price in comparison with the purchase intentions related to the regular price before contact with the price promotion.

H5: The stronger the reduction of consumers' willingness to pay after exposure to a price promotion, the lower the purchase intentions related to the regular post-promotion price in comparison with the purchase intentions related to the regular price before contact with the price promotion.

The hypotheses derived above will be tested in the empirical study presented below.

3. Empirical study

3.1 Sample, test stimuli, experimental design, and procedure

The initial sample consisted of 296 respondents (63% women, average age: 23.7 years). The contact with a price promotion can lead to lower reference prices for some respondents and may have no such effect for others. In addition, there might also be some respondents who have higher reference prices after contact with a price promotion for some reason. The purpose of our study was to focus on reductions of reference prices and willingness to pay after contact with a price promotion as well as their effects on negative changes of purchase intentions. This is the most plausible and, for marketers, the most harmful scenario. Thus, we selected those respondents from our sample who showed such negative reactions and used the reference price reduction as selection criterion (change into a negative direction: $N = 132$; no change: $N = 120$, change into a positive direction: $N = 44$) as will be explained in the following. Among the three variables considered, the reference price has the most direct link with the price promotion, while willingness to pay and purchase intention are considered as more downstream variables. In addition, we decided to use the change of reference price, rather than the change of willingness to pay, as the main criterion for selection for the following two reasons. Previous studies have shown that promotions can have negative effects, particularly on consumers' reference prices (e.g., *Bambauer-Sachse/Dupuy 2012; Chandrashekarani/Grewal 2006; DelVecchio et al. 2007*), while evidence for such effects on willingness to pay is rather rare. Moreover, even if consumers' willingness to pay is positively correlated with their reference price (*Ranyard et al. 2001*), a reference price reduction does not automatically imply a reduction of willingness to pay, which may also be based on other factors. If consumers show a reference price reduction, the negative effects of a price promotion are likely to be comparatively strong. If a considerable number of respondents already show a reduction of their reference price in a study such as ours and after one contact with a price promotion, in a real setting, the effects are likely to be even stronger and the number of consumers affected higher. Note that it is not the purpose of this study to explain why some respondents might show no change or a change into a positive direction. Besides, it is not necessary to explain such phenomena because they are neutral or even beneficial scenarios for marketers and thus do not call for action.

From the sub sample of 132 respondents, we deleted four respondents who reported a change of the reference price into a negative direction, but a change of their willingness to pay into a positive direction, which suggests, in addition to other inconsistent answers

provided by these respondents, inconsistent response behaviour. Thus, the sample used for data analysis consisted of 128 respondents (66% women, average age: 23.7 years).




We selected a percentage-off promotion because this promotion type is very common in practice (Yin/Dubinsky 2004) and often described in the literature (Hardesty/Bearden 2003; Krishna et al. 2002). In addition, studies report negative effects on consumers' reference prices (Chandrashekarani/Grewal 2006), which are more negative than the effects of amount-off promotions (Bambauer-Sachse/Massera 2015). It is particularly interesting to examine such a condition where a promotion has a comparatively destructive effect on reference prices because this in turn will have more severe negative consequences and will lead to a greater need for action for marketers.

We used two test products with different price levels (low price product: socks; high price product: winter jacket) and two discount levels (low: 10%, high: 50%; Della Bitta et al. 1981) in order to generate variance in consumers' reference prices. We selected socks and winter jackets as test products because consumers can easily put themselves into a purchase situation for these products and are likely to have formed a reference price. The latter aspect was backed up by a preliminary discussion with a group of ten students. We used test products with a fictitious brand in order to focus on the effects of price promotions on product category-related reference prices and to avoid any bias through possible brand-related reference prices because previous research clearly describes and examines the reference price as a phenomenon linked to the product category (Cheng/Monroe 2013; Kalyanaram/Little 1994; Winer 1986). The regular prices of the test products were determined in a pretest. The 60 pretest participants (57% women, average age: 26.1 years) saw a picture of the test product (the same picture as used in the test ads for the main study) without price information and had to indicate the average, the expected, and the fair price ($\alpha = 0.958$). We determined the price for each product by averaging these three pieces of price information ($M_{\text{socks}} = 6.29$; $M_{\text{winter jacket}} = 184.19$) and slightly modifying the resulting prices in order to obtain more realistic prices (socks: 6.30 CHF; winter jacket: 185.90 CHF). The pretest participants had no difficulty in answering the questions concerning their reference price related to the respective test products. This observation additionally supports the basic assumption that the majority of the respondents in the main study had reference prices in their mind for the test products used.

The procedure of the data collection was as follows. The respondents were only presented with one variant of the stimulus material (variant 1: socks, low discount; variant 2: socks, high discount; variant 3: winter jacket, low discount; variant 4: winter jacket, high discount) in order to avoid learning effects generated by the evaluation of multiple stimulus materials. The questionnaire started with an opening scenario that asked the respondents to imagine that they were strolling through a shopping mall with the intention of purchasing the test product, but without a specific brand in mind. The opening scenario was followed by three parts (Table 1) that aimed to simulate three shopping situations: regular price advertised before contact with the price promotion, reduced price advertised during the price promotion period, and regular price advertised after contact with the price promotion. The respondents first saw the test product and had to indicate their purchase intentions with regard to this offer. Afterwards, their reference prices and willingness to pay were measured (measurement before exposure to the price promotion). After some filler questions, the respondents were shown the test ad with the respective price promotion (test ads displayed the regular price, the reduced price, and the saving in the

percentage-off format) and had to indicate their purchase intentions related to the price promotion. Next, their reference prices and willingness to pay were measured again (measurement after exposure to the price promotion). After some further filler questions, the respondents were shown an ad displaying the test product at the regular price without any price promotion and they had to indicate their purchase intentions with regard to this offer. Then, the reference prices and willingness to pay were measured again. Finally, the respondents were asked to judge scenario credibility and to provide some demographic information. The three measurements of the variables of interest were needed to measure the effects of interest as clearly and exactly as possible and to test the hypotheses as will be explained in the following. In order to test *H1*, we needed to compare measurement 2 and measurement 1. For *H2*, we compared measurement 3 with measurement 2 and measurement 1. For *H3*, *H4*, and *H5*, we determined the difference between measurement 2 and 1 for the reference price and willingness to pay and the difference between measurement 3 and 1 for the purchase intentions. One might criticise the fact that measuring the variables of interest three times could also lead to learning effects that might bias the results. However, including filler questions as described above introduces a short time lag between the three measurements, distracts the participants from identifying patterns in the study set up, and minimises possible bias.

Table 1: Scenarios and test stimuli (test product: socks)

Contact with the regular price before contact with the promotion	Contact with the promotion price	Contact with the regular price in the post-promotion period
<i>Please have a look at the following ad for socks:</i>	<i>Now imagine that while walking through the shopping mall, you flip through the mall's "Specials of the week" magazine where you find the following promotion for socks:</i>	<i>Imagine that you once again walk through this mall and you see the following ad for the same socks, which are no longer on promotion:</i>
		

3.2 Measures

We measured the reference price (before contact with the promotion, after contact with the promotion, and in the post-promotion period) using three dimensions derived from the conceptual categorisations presented above: the average market price, the price expected for the next purchase, and the fair price. The before and after measurement of consumers' reference prices enables the determination of the change (reduction) of this variable that was needed to test the hypotheses. The reference price reduction was determined by calcu-

lating the item-wise difference for each measurement after contact with the promotion and before contact with the promotion. Then the individual differences were averaged.

Willingness to pay (before contact with the promotion, after contact with the promotion, and in the post-promotion period) was measured by the direct question “If you were to buy such a product, what would be the highest price you would be willing to pay?” (Johannesson *et al.* 1997; Wertebroch/Skiera 2002). The reduction of willingness to pay was then determined by calculating the difference “willingness to pay after contact with the promotion minus willingness to pay before contact with the promotion”.

The three items used to measure purchase intentions were developed according to the set of items proposed by Dodds *et al.* (1991) and Grewal *et al.* (1998a) (“I would like to buy the *product*”; “There is a strong chance that I would take advantage of this offer”; “There is a high probability that I would consider buying this *product*”). The change in purchase intentions per item was determined by calculating the difference between the purchase intentions related to the regular price in the post-promotion period and purchase intentions related to the regular price before contact with the price promotion; these differences were finally averaged.

Brown *et al.* (1993) mention critically that difference scores may have a lower reliability than the component variables used to determine the difference when the components are highly correlated. Consequently, they suggest using alternative methods if possible, such as operationalising the direct comparison (asking respondents to mentally determine the difference; Peter *et al.* 1993) in order to avoid difference scores (Peter *et al.* 1993). In our case, the reliabilities of the difference scores calculated with the formula provided by Brown *et al.* (1993) are relatively high (reference price reduction: $\alpha = 0.775$, change of purchase intentions: $\alpha = 0.847$) even though the component variables are highly or moderately correlated (reference price: $r_{\text{before contact with the promotion_after contact with the promotion}} = 0.867$; purchase intention: $r_{\text{before contact with the promotion_post promotion period}} = 0.556$). Thus, the described problem of rather low reliabilities is not given here. Peter *et al.* (1993) further mention the problem that a restriction of the variance of the difference score variable may occur and that a systematic variance restriction can lead to misinterpretation of the significance of OLS regression coefficients. This point of criticism might apply to our case. However, it would not have been possible to alternatively measure mentally determined differences here, as will be argued in the following. In order to determine the effects that are of interest here as clearly as possible, we needed to obtain three unbiased measures of our variables. The precise measures clearly linked to the three different scenarios enabled us to obtain these values and to determine the changes in a comparatively unbiased way. Asking the respondents to calculate all differences mentally would have biased the results considerably and would never have provided clearly distinct measures for all variables. Scenario credibility was measured with one item (“The test scenario is credible to me”). A one sample t-test against the scale midpoint of 4 shows that, on average, the respondents perceive the test scenario as realistic ($M = 5.07$, $t = 18.44$, $p > 0.001$).

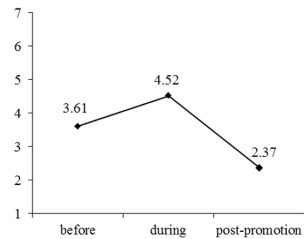
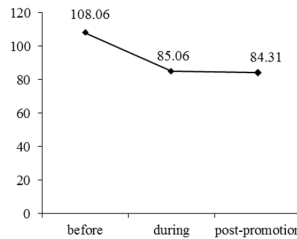
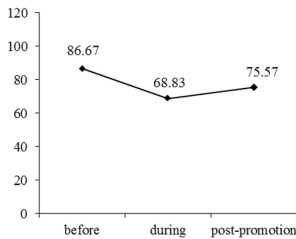
3.3 Data analysis and results

In the first step, we examine consumers’ reference prices, willingness to pay, and purchase intentions in the three purchase situations of interest. The respective mean values are presented separately for the test products in the first part of *Table 2*. As these mean values

demonstrate consistent patterns across test products, the mean values pooled across products are also presented in the second part of *Table 2*.

Table 2: Consumers' reference prices, willingness to pay, and purchase intentions in the three examined purchase situations

Reference price			Willingness to pay			Purchase intention		
before	during	post-promotion	before	during	post-promotion	before	during	post-promotion
sub sample: socks (n=55)								
5.32	4.32	4.70	6.84	5.49	5.66	3.70	4.91	2.42
before vs. during: $t = 8.129^{**}$			before vs. during: $t = 7.996^{**}$			before vs. during: $t = -5.000^{**}$		
during vs. post: $t = -3.229^*$			during vs. post: $t = -1.511$			during vs. post: $t = 9.855^{**}$		
before vs. post: $t = 4.284^{**}$			before vs. post: $t = 6.731^{**}$			before vs. post: $t = 6.707^{**}$		
sub sample: winter jacket (n=73)								
147.97	117.43	128.96	184.33	145.01	143.56	3.55	4.23	2.34
before vs. during: $t = 9.798^{**}$			before vs. during: $t = 6.956^{**}$			before vs. during: $t = -3.945^{**}$		
during vs. post: $t = -3.922^{**}$			during vs. post: $t = 0.321$			during vs. post: $t = 9.635^{**}$		
before vs. post: $t = 6.235^{**}$			before vs. post: $t = 6.123^{**}$			before vs. post: $t = 7.501^{**}$		
pooled sample (n=128)								
86.67	68.83	75.57	108.06	85.06	84.31	3.61	4.52	2.37
before vs. during: $t = 8.122^{**}$			before vs. during: $t = 6.352^{**}$			before vs. during: $t = -6.287^{**}$		
during vs. post: $t = -3.867^{**}$			during vs. post: $t = 0.293$			during vs. post: $t = 13.642^{**}$		
before vs. post: $t = 5.805^{**}$			before vs. post: $t = 5.703^{**}$			before vs. post: $t = 10.099^{**}$		



Notes: **: $p < 0.001$; *: $p < 0.01$; before: contact with regular price before contact with the price promotion; during: contact with the price promotion; post-promotion: contact with regular price in the post-promotion period.

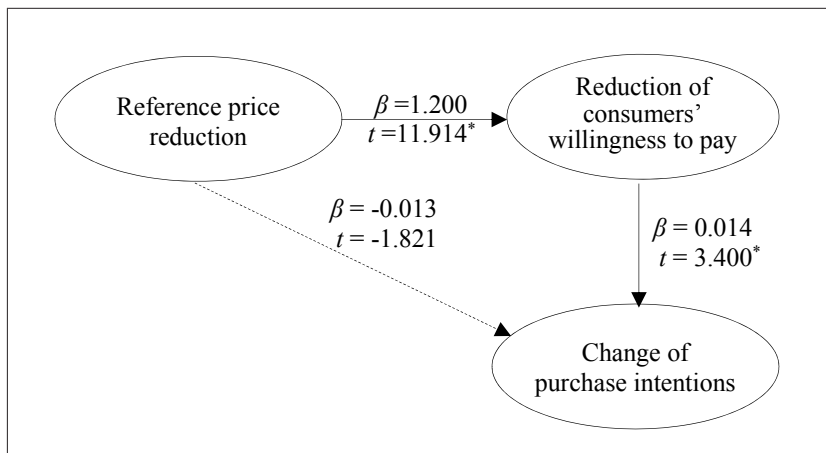
The mean values and t -test results in *Table 2* show that consumers' reference prices and willingness to pay are reduced considerably after exposure to the price promotion. Consumers' average reference price after contact with the promotion price and their average reference price after contact with the regular price in the post-promotion period are lower than the average reference price before contact with the price promotion. The finding that the average reference price does not return to its initial level when the promotion is over clearly demonstrates the persistent negative effect of a price promotion in the post-promotion period. In addition, the results show that the reference price at least increases slightly when the promotion is over while this is not the case for willingness to pay. The fact that the effects on the reference price and on willingness to pay differ supports the assumption that these variables represent distinct concepts even though they are moderately correlated ($r_{\text{reference price reduction_reduction of willingness to pay}} = 0.728, p < 0.001$; Burns/Bush 2014).

The comparison of purchase intentions related to the regular price before contact with the price promotion, purchase intentions during the price promotion, and purchase intentions related to the regular price in the post-promotion period shows that promotion-relat-

ed purchase intentions are significantly higher than purchase intentions related to the regular price before contact with the price promotion. In addition, purchase intentions related to the regular price in the post-promotion period are not only lower than promotion-related purchase intentions, but even lower than purchase intentions related to the regular price before contact with the price promotion. This finding shows that, after contact with a price promotion, purchase intentions remain low and do not return to the initial level. These findings show that price promotions have positive short-term effects, but negative effects on purchase intentions in the post-promotion period and thus provide support for *H1* and *H2*.

In the next step, we look more closely at the processes triggered by contact with a price promotion, thus at the relations between consumers' *reduction* of their reference price and willingness to pay and the *change* of purchase intentions (i.e., we consider the difference values determined as described above, based on the pooled sample). We used the PROCESS procedure for SPSS (Hayes 2013, model template 4, 10,000 bootstrap samples). Figure 1 shows the path coefficients and the corresponding *t*-values for the relations between the variables of interest.

Figure 1: Path coefficients and *t*-values



Note: * $p < 0.001$.

The results show that the reduction of consumers' reference price after the exposure to a price promotion has a direct positive effect on the reduction of their willingness to pay ($\beta = 1.200$, $t = 11.914$, $p < 0.001$). Thus, *H3* is supported. Consequently, the stronger the reference price reduction, the stronger the reduction of the willingness to pay. However, the reference price reduction does not directly affect the negative change of consumers' purchase intentions ($\beta = -0.013$, $t = -1.821$, $p > 0.05$). Thus, *H4* is not supported. The reduction of consumers' willingness to pay has direct effects on purchase intentions in that the negative change of purchase intentions is stronger with an increasing reduction of consumers' willingness to pay ($\beta = 0.014$, $t = 3.400$, $p < 0.001$). Thus, *H5* is supported. These findings suggest that the reduction of consumers' purchase intentions in the post-promotion period (i.e., when the product is sold at the regular price again) is affected directly by a reduction of their willingness to pay and indirectly by a reduction of their reference

price, which works through willingness to pay (indirect effect: reference price reduction → reduction of willingness to pay → change of purchase intentions: 0.017, CI = [0.010, 0.028]).

Thus, these results show that, as hypothesised, a reduction of the reference price leads to a reduction of consumers' willingness to pay. Furthermore, while the reduction of consumers' willingness to pay directly affects the change of purchase intentions, the reference price reduction has no such effect (contrary to the assumption of *H4*). Thus, a lower willingness to pay after contact with a price promotion directly causes lower purchase intentions whereas a lower reference price after contact with a price promotion indirectly leads to lower purchase intentions through a reduced willingness to pay. The finding regarding the role of the reference price is of particular interest because previous research findings (e.g., *Lattin/Bucklin 1989; Kalwani/Yim 1992*) rather suggest a direct role of the variable in the context of reduced purchase intentions after contact with a price promotion. This unexpected result may be explained as follows. Consumers are not consciously aware of the influence of the promotional price information on their reference price (*Adavall/Monroe 2002*). When consumers adapt (reduce) their reference price related to a product category, they are likely to use a heuristic to process the new price information on a sub-conscious level (*Frankenberger/Liu 1994*), while they reflect on their willingness to pay on a conscious level.

4. Conclusion

The objectives of this study were to examine how consumers' purchase intentions change after contact with a price promotion and to understand the mechanisms underlying this effect. More specifically, we wanted to analyse how purchase intentions change not only in the promotion period, but also whether there are persistent effects in the post-promotion period when the product is sold at the regular price again. The findings show that price promotions lead to reductions of consumers' reference prices and willingness to pay, which in turn indirectly (reference prices) or directly (willingness to pay) affect purchase intentions in that these are lower in the post-promotion period than before contact with the price promotion. Thus, we observed two very different levels of purchase intentions related to the same price, and the drivers of this difference are reductions of consumers' reference price and willingness to pay due to the contact with the price promotion. Although the reduction of consumers' reference price does not directly explain the reduction of purchase intentions, it represents an important concept in this context because it determines the reduction of consumers' willingness to pay. A possible explanation for the indirect effect of the reduction of consumers' reference price and the direct effect of consumers' willingness to pay could be the following. The reference price is formed and operates on a subconscious level whereas consumers' willingness to pay has direct behavioural consequences because consumers are well aware of their willingness to pay.

These results provide an interesting contribution to previous research because previous studies have examined *either* short-term *or* long-term effects of price promotions, but no study has looked at whether and how purchase intentions in the post-promotion period differ from purchase intentions related to the regular price before contact with a price promotion. The study presented here not only analyses this effect in detail, but also provides additional insights into the psychological mechanisms underlying this effect represented

principally by the two distinct concepts of the reduction of consumers' reference price and their willingness to pay.

In addition to the contribution to research, the results of this study provide marketers with the notion that price promotions can generate positive consumers' responses during the price promotion period, but also negatively affect their responses in post-promotion periods. The results show that a reduction of consumers' reference price and willingness to pay drive consumers' change of purchase intentions. These findings provide marketers with knowledge about the levers they can use to mitigate the negative effects of price promotions in post-promotion periods when the product is sold at the regular price again. An important implication for marketers is that they should not only try to influence consumers' reference price by providing external price cues that attenuate the reduction of the reference price as often described in the literature (*Biswas/Blair 1991; Chandrashekar/Grewal 2006; Lowengart 2002*) and carried out in marketing practice. Marketers should additionally try to increase customers' willingness to pay in the post-promotion period. We would exceed our findings if we described concrete measures since it is beyond the scope of our study to test such measures. However, based on the literature, we can identify possible strategies. Marketers could for example highlight product quality (*Bertini et al. 2012*) through an additional message or visual cues in order to convince consumers to pay the regular price again when the price promotion is over. In addition, they could invest heavily in consumer satisfaction (*Homburg et al. 2005*) and loyalty (*Palmatier et al. 2007*) because these concepts are strong drivers of willingness to pay and thus might help re-establish higher levels of willingness to pay. Related to this, the critical question may be raised as to whether promotions are actually useful for high quality products which consumers are highly satisfied with, because consumers are willing to purchase such products at the regular price, and price promotions might therefore have negative effects on quality perceptions (*Darke/Chung 2005; Raghurir/Corfman 1999*). Examining what is being done in marketing practice shows that price promotions can be found for example for upscale cosmetics or upscale food such as espresso beans or olive oil. The reason for using promotions even for high quality products consumers are highly satisfied with is to reward loyal customers for their loyalty and to attract consumers who would never buy such products at the regular price (*Kinberg et al. 1974; Kumar/Leone 1988*). Testing the effectiveness of such strategies could be the subject of future studies.

As is the case with all studies, this research has some limitations. Basically, one might critically question how realistic the study set up is. Of course, measuring the variables of interest three times makes the respondents more aware of the respective concepts than in reality. This might lead to an overestimation of the values at the three points of measurement. However, this is not problematic because, for the main analyses, differences were used. Thus, even if the single measures are higher than they might be in reality, it is likely that the differences will remain more or less the same. Another basic point of criticism is the question of how much the research design, particularly selecting those respondents with a reference price reduction, determined the results. Such criticism might hold if the purpose had been to examine whether price promotions have rather negative or rather positive effects on purchase intentions or whether purchase intentions are reduced after contact with a price promotion. Instead, one objective of our study was to show that purchase intentions in post-promotion periods are not only lower than during the promotion, but even lower than before contact with the price promotion. Another objective was to

examine the mechanisms underlying the effects observed. The findings related to these objectives are not determined by the research design. From a procedural point of view, another limitation might be that filler questions were used between the three scenarios, but there were no real time lags between the three measurements of the variables of interest. Future research could examine the phenomenon observed here in a more realistic context by leaving more time between the three points of measurement. Moreover, in this study, the percentage-off promotion format was used in order to generate strong effects on the variables of interest. Further research could analyse possible effects for other promotion formats and types. For example, it could be interesting to examine promotions that give consumers a free gift in addition to the purchased product (Montaner et al. 2011; Raghuram 2004). As consumers tend to process this type of promotion independently of the regular product price (Chandran/Morwitz 2006), it is likely to lead to different levels of price adaptation and thus to have different effects on consumer response. Furthermore, as previous research has demonstrated that consumers process the promoted information differently depending on the number of exposures to the price promotion (Bambauer-Sachsel/Massera 2015), it could be interesting to extend the analyses presented here by adding this variable. Moreover, the results show that consumers exposed to the regular price partially re-adapt their reference price into the direction of this most recent piece of price information in the post-promotion period. Even if this variable does not directly drive negative consumer reactions in the post-promotion period, it would be interesting to analyse how many contacts with the regular price after a promotion period are needed for the reference price to return to its initial level (reference price before contact with the promotion). Furthermore, when interpreting the study results, it was argued that processing on subconscious levels might explain why the reduction of the willingness to pay has direct effects on purchase intentions while the reference price reduction only has indirect effects. However, processing consciousness was not explicitly measured or determined. Therefore, future studies could test the assumption that reference prices operate on a subconscious level and thus only indirectly affect consumer behaviour, whereas willingness to pay operates on a conscious level and thus has direct behavioural consequences. Furthermore, as our study only covers price-related aspects of consumers' reactions to price promotions, one might criticise the fact that other factors such as quality perceptions (Darke/Chung 2005), brand perceptions (Raghuram/Corfman 1999), brand loyalty (Papatla/Krishnamurthi 1996), or brand credibility (Gupta/Cooper 1992) might also play a role in the context of effects of price promotions in post-promotion periods. Future studies could examine the role of such factors. Finally, the results of this study provide the notion that price promotions can have negative effects on the intention to repurchase the product at the regular price in the future. However, the study did not examine how marketers could limit such negative effects of price promotions. Thus, in future studies, it could be interesting to analyse which marketing strategies are most effective in re-establishing a higher willingness to pay and higher purchase intentions in post-promotion periods.

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