

How much compensation is too much? An investigation of the effectiveness of financial overcompensation as a means to enhance customer loyalty

Tessa Haesevoets* Alain Van Hiel† Mario Pandelaere‡§ Dries H. Bostyn† David De Cremer¶

Abstract

The present paper examines the effectiveness of financial overcompensation as a means to enhance customer loyalty after a product failure. Overcompensation implies that customers are entitled to a refund that is larger than the purchase price. It is, however, still unclear whether large overcompensations entail saturation effects, or alternatively, result in an actual drop in customer loyalty. We predicted that the overcompensation-loyalty relationship is generally characterized by an inverted U-shaped function. In line with this prediction, the results of four studies showed that mild overcompensations had, on average, a positive effect on customer loyalty beyond equal compensation, but only up to compensation levels of approximately 150% of the purchase price of faulty products. Beyond this level, the effectiveness of overcompensation diminished, eventually leading to a general drop in customer loyalty. Despite this overall pattern, two studies revealed robust individual differences in how customers react to increasing overcompensation. A majority of customers increased their loyalty when the overcompensation enlarged, but the curve flattened out in the high range. However, there was also a smaller portion of customers who reacted negatively to every form of overcompensation. A practical implication of these findings, therefore, is that companies should not offer compensations that are greater than 150% of the initial price, as these do not contribute to greater loyalty in any category of customers.

Keywords: overcompensation, customer loyalty, curve progression, inverted U-function, optimum, individual differences

1 Introduction

Suppose that you bought a new vacuum cleaner at a nearby store. The vacuum cleaner turned out to be malfunctioning and you decided to go straight back to the store to complain about this. One way to settle this product failure is through a monetary reimbursement by the store. Customers often receive compensation that exceeds the damage suffered, which is generally referred to as overcompensation (Gelbrich & Roschk, 2011). In the example of a malfunctioning vacuum cleaner, the store can, for instance, offer you a reimbursement that is worth more than the original purchase price. Similarly, in case of hotel overbooking, customers can be offered the finest suite of the hotel or, if no other room is available, a voucher- or cash-based compensation that is worth more than

the original room price (Noone & Lee, 2011). Or, when a restaurant serves the wrong dish, it can replace the dish and additionally offer the customer the meal for free (Hocutt, Bowers & Donovan, 2006). Other examples of overcompensation can be found in the context of insurance companies that sometimes overpay material losses (Tullberg, 2006).

Despite its pervasive use and its additional financial cost to companies, it is unclear how overcompensation affects customers' responses beyond compensation that covers the damage exactly (i.e., equal compensation). This is particularly the case in light of maintaining or even enhancing customer loyalty. From an economic perspective, individuals are primarily concerned with maximizing their own outcomes, and, as a result, greater compensation should lead to greater loyalty. Following this "more is better" assumption, overcompensation should be a more effective remedy than equal compensation, and even greater levels of overcompensation should result in higher loyalty levels than smaller ones. In the present study we investigated whether this is indeed the case.

1.1 Effectiveness of Financial Overcompensation

For most companies occasional lapses in product (or service) quality are nearly inevitable, making attempts to restore such

This research was supported by a research grant from the National Fund for Scientific Research-Flanders (under grant number G095912N).

Copyright: © 2016. The authors license this article under the terms of the Attribution 3.0 License.

*Department of Developmental, Personality and Social Psychology, Ghent University, Henri Dunantlaan 2, B-9000, Ghent, Belgium. Email: Tessa.Haesevoets@UGent.be.

†Department of Developmental, Personality and Social Psychology, Ghent University, Belgium.

‡Department of Marketing, Ghent University, Belgium

§Pamplin College of Business, Virginia Tech, Blacksburg, VA, USA

¶Judge Business School, University of Cambridge, UK

failures highly relevant. Because the primary reason for a complaint is often a monetary loss by the customer, reimbursing this tangible damage is seen as vital for the recovery process. Ample studies have indicated that compensation is indeed the key driver of satisfaction and repurchase intention after failures (for overviews, see Davidow, 2003; Gelbrich & Roschk, 2011). Consequently, companies might opt to provide customers as much compensation as possible, and – as illustrated by the above mentioned examples – compensations that surpass the mere damage are frequently employed by companies.

Although overcompensation is an open-ended interval with no natural upper boundary, most prior compensation studies included a maximum of two or three overcompensation levels (e.g., Boshoff, 1997; Garrett, 1999; Gilly & Hansen, 1985; Hocutt et al., 2006; Noone & Lee, 2011), which is insufficient to cover the broad overcompensation range. Fortunately, there is a recent study by Gelbrich, Gähke and Grégoire (2015) in which the effectiveness of 11 compensation levels (ranging from 0% to 200% of the loss, in steps of 20%) were compared. Importantly, although Gelbrich and colleagues included a total of 11 compensation levels, only five of these were larger than the loss and can hence be categorized as overcompensations (i.e., 120%, 140%, 160%, 180%, and 200%). In this overcompensation range, the compensation-satisfaction relationship was represented by a concave curve. Small amounts of overcompensation were more effective than equal compensation. However, for larger overcompensations the estimated curve showed a downward slope when customers rejected a flawed service, but a further examination of the observed mean values indicates a saturation effect instead of a negative return. Consequently, Gelbrich et al. noted the following: “As the observed means seem to indicate saturation, we suggest collecting additional data for extreme values to better understand this pattern (. . .). Such research could confirm a saturation effect or may find a true negative effect” (p. 119).

In reaction to this observation, an important aim of the present research was to investigate the curve progression between overcompensation and recovery in greater detail, in order to unravel whether high amounts of overcompensation lead to a saturation effect (resulting in a flattening curve) or a true negative effect (leading to a downstream curve). In both cases, the overcompensation becomes cost-ineffective at a certain point, but a downstream curve would even indicate that costly overcompensation may in fact harm the interests of companies. In this vein, we also aimed to identify the optimal overcompensation level that results in the highest degree of recovery. Further, we also explored if there are individual differences in how customers respond to different levels of overcompensation.

1.2 Curve Progression

In the present study customer loyalty – a multiple dimensional construct that includes, besides repurchase intention, the willingness to recommend a company to others and to return to a company in the future (Lam, Shankar, Erramilli & Murthy, 2004; Webster & Sundaram, 1998) – was investigated as the main outcome variable. We started from the basic assumption that the degree of customer loyalty may depend on the overcompensation size (following Gelbrich et al., 2015). That is, the impact of an overcompensation is expected to differ in specific zones along the overcompensation continuum.

Note that, in case of a product failure, the customer has to establish that the product is actually defective, physically return the faulty product, and persuade the company to replace or reimburse the item. Returning a dissatisfactory product thus elicits additional costs for the customer in terms of time and money, and because it is unpleasant to return a product and express complaints, it can also lead to psychological costs. In order to establish a failure free situation, the provided reimbursement should thus be larger than the product price of the dissatisfactory product in order to take the inconveniences of returning a faulty product into consideration. It can therefore be expected that customers feel that they are entitled to receive more than just damage restoration. As such, small overcompensation is expected to enhance customer loyalty beyond the level that is already reached by equal compensation. Although a general positive effect can be expected from small overcompensation, prior research indicates that especially large amounts of cash-based overcompensation are not well received by customers (Estelami & De Maeyer, 2002; also see Garrett, 1999; Noone & Lee, 2011, for some examples). In this light, it can be expected that, from a particular level onwards, the overcompensation will be perceived as too much, and as such could result in a decay in customer loyalty.

1.3 Individual Differences

Prior studies investigating overcompensation effects all employed between-subject designs in which subjects were confronted with only one single compensation level (Boshoff, 1997; Estelami & De Maeyer, 2002; Gelbrich et al., 2015; Garrett, 1999; Hocutt et al., 2006; Noone & Lee, 2011). As a result, these studies did not incorporate analyses of how people react to different overcompensation sizes. Although we expect that the curve between overcompensation and customer loyalty is inverted U-shaped, it is possible that there are individual differences in how customers respond to various overcompensation levels. Indeed, the presence of a general trend does not preclude the possibility of different classes of individuals, all reacting differently to increasing levels of overcompensation.

In this regard, we might expect that there are customers for whom loyalty increases with extra overcompensation and customers for whom loyalty decreases with extra overcompensation. A salient group, at least in theoretical terms, might be labelled as “homo economicus”. This concept portrays humans as consistently rational and narrowly self-interested agents who usually pursue to maximize utility as a consumer (Rittenberg & Tregarthen, 2012; Camerer & Thaler, 1995; Dawes & Thaler, 1988). Because in economic terms larger compensations result in better outcomes for the customer, for these people it can be expected that the greater the level of compensation, the higher the level of recovery will be. As such, for this subset of customers it is expected that overcompensation results in higher loyalty ratings than equal compensation (Boshoff, 1997; Gilly & Hansen, 1985; Hocutt et al., 2006), and, even more importantly, that greater levels of overcompensation result in higher loyalty ratings than smaller ones (Gelbrich et al., 2015).

However, given the evidence that rather high overcompensation results in similar or even lower levels of customer loyalty than equal compensation (Garrett, 1999; Estelami & De Maeyer, 2002; Noone & Lee, 2011; also see Haesevoets, Reinders Folmer, De Cremer & Van Hiel, 2013; Haesevoets, Van Hiel, Reinders Folmer & De Cremer, 2014), other customers might react negatively to every form of overcompensation, resulting in an immediate decline in customer loyalty once the compensation transcends the point of equality. Indeed, many people prefer equal outcomes over unequal outcomes (Loewenstein, Thompson & Bazerman, 1989). Moreover, inequality is not only considered to be unwanted when one receives less than another party, but receiving more than others is generally considered to be undesirable too (Blount, 1995; Dana, Cain & Dawes, 2006). Given that overcompensation is a form of advantageous inequality, customers may feel guilty and indebted to the provider of the compensation as they believe that they are getting much more than they deserve (Garrett, 1999; McCollough, Berry & Yadav, 2000). Therefore, greater levels of overcompensation result in lower levels of customer loyalty than smaller ones for a subset of customers.

However, as we are unaware of any study of individual differences in the context of overcompensation, the present exploration may yield other classes of individuals showing distinct reactions across the range of overcompensations. Moreover, rising and falling curves are not necessarily linear but might instead be quadratic. In the present research we employed within-subject design studies in which each subject had to rate multiple overcompensation levels in order to examine the existence of these individual difference patterns.

1.4 The Present Studies

The goals of the present study were twofold. First, we aimed to determine the exact nature of the relationship between the

level of overcompensation and the degree of customer loyalty, because, especially in the high overcompensation range, it is still unclear whether in general terms the compensation-loyalty curve flattens or actually declines. We thus aimed to identify the optimal level of overcompensation that generates the highest degree of customer loyalty on average. The second aim of our research was to investigate possible individual differences in how customers react to increasing levels of overcompensation. No prior studies, at least to our knowledge, have investigated such individual differences.

In order to achieve these two goals, we conducted four studies in which we systematically studied the overcompensation continuum by including a wide range of different overcompensation levels and by using different study methods. In the first study subjects were asked to evaluate one single compensation level, whereas in the latter three studies subjects had to rate multiple compensation levels (both separately and in pairs).

2 Study 1

Similarly to the research of Gelbrich and colleagues (2015), we investigated the overcompensation continuum using a design in which the different compensation levels were manipulated between-subjects. In order to better understand the slope of the compensation-loyalty curve in the high overcompensation range (flat or declining), we followed these authors' suggestion to include more extreme overcompensation values. In this light, in addition to a 100% and 150% compensation level, we included two more extreme overcompensation amounts which covered 300% and 500% of the product price of a dissatisfactory product.

2.1 Method

2.1.1 Subjects and Design

A sample of 192 US citizens (92 men, 100 women, $M_{age} = 34.22$, $SD = 12.13$) was recruited through Amazon Mechanical Turk (Buhrmester, Kwang & Gosling, 2011; Hauser & Schwarz, 2016; Paolacci & Chandler, 2014). Subjects completed a scenario study in exchange for payment. To safeguard data quality, we implemented multiple attention checks spread throughout the study. One subject (0.5%) was excluded from further analyses because he failed on these check questions; three additional subjects (1.6%) were excluded because they were unable to answer our manipulation check regarding the received compensation level correctly. Subjects were randomly assigned to one condition of a 4-level (compensation level: 100%, 150%, 300%, and 500% of the purchase price) between-subjects design.

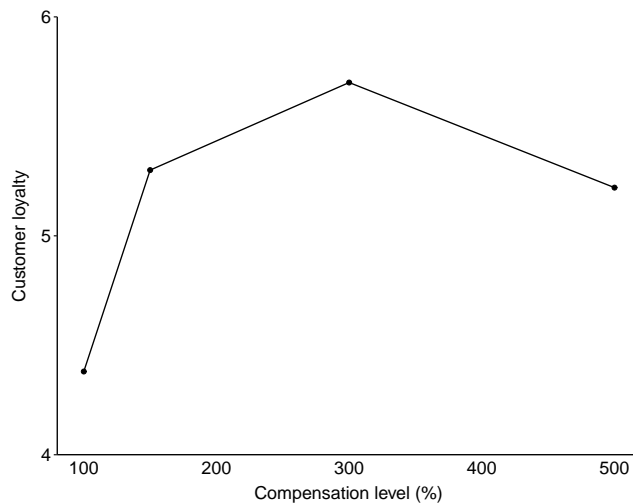


FIGURE 1: Relationship between compensation level and customer loyalty in Study 1. The graph is based on the observed means: $M_{100\%} = 4.38, SD = 1.84$; $M_{150\%} = 5.30, SD = 1.56$; $M_{300\%} = 5.70, SD = 1.07$; $M_{500\%} = 5.22, SD = 1.72$.

2.1.2 Procedure

Subjects were presented with a written scenario in which they were asked to imagine that their vacuum cleaner broke down and that they paid \$100 for a new one at a nearby store. When subjects returned home, their new vacuum cleaner turned out to be malfunctioning. Subjects were then asked to imagine that they returned to the store to complain about this product failure. Subsequently, subjects were informed that the store reacted to this failure by offering them a compensation that exactly covered the purchase price (i.e., \$100) in the equal compensation condition, or a compensation that was larger than the purchase price in the three overcompensation conditions (i.e., \$150, \$300, or \$500).

2.1.3 Measures

Following Gelbrich et al. (2015), we first checked the effectiveness of the compensation manipulation using an open-ended question about the perceived monetary value of the remuneration. More specifically, we asked subjects: “How much money did you receive from the store as compensation for your broken vacuum cleaner?” Next, customer loyalty was measured with a four item scale. These items are based on former scales that probed different indicators of customer loyalty (see Butcher, Sparks & O’Callaghan, 2002; Grewal, Roggeveen & Tsiros, 2008; Lam et al., 2004). Specifically, we asked subjects to rate the following items: “I am planning to purchase products at this store in the future” (repurchase), “I look forward to return to this store again” (return), “I will recommend this store to a friend who seeks my advice” (recommend), and “I will buy more products in this store again

in the future” (patronage) (1 = not at all, 7 = very much; $M = 5.14, SD = 1.64$, Cronbach alpha = .97).

2.2 Results

Figure 1 shows the relationship between the level of compensation and the degree of customer loyalty. The initial increase is followed by a downwards trend in the high overcompensation range, which suggests an inverted U-relationship between compensation level and customer loyalty. In order to test statistically whether the overcompensation-loyalty curve is quadratic in nature, we conducted a regression analysis, using SPSS software, in which we included both the linear (Model 1) and the quadratic term (Model 2) for the effect of compensation level. The results of this analysis revealed that in the first model the linear term explained 2.0% of the variance in customer loyalty ($b = 0.14, F(1, 186) = 3.85, p = .05$). In the second model, the addition of the quadratic term explained an additional 5.5% of the variance in customer loyalty ($F(1, 185) = 11.05, p = .001$). Here, the beta-values of the linear ($b = 1.51, p < .001$) and the quadratic term ($b = -1.39, p = .001$) were both significant.

In addition, we also conducted a post-hoc test to examine whether there were significant differences among the four compensation levels. This test revealed that the equal compensation condition (100%) resulted in significant lower customer loyalty ratings (all $ps < .05$) than the three overcompensation conditions (150%, 300%, and 500%). Although Figure 1 suggests a small decay in customer loyalty for the highest overcompensation level, no significant differences in customer loyalty were found among the three overcompensation levels (all $ps > .46$). As such, we were not able to substantiate the presence of an inverted U-curve.

2.3 Discussion

Following the example of Gelbrich et al. (2015), we investigated the effectiveness of different overcompensation sizes with a between-subjects design. There was no actual decline in the high overcompensation range, as our results revealed no significant differences among the three included overcompensation conditions. Similar to Gelbrich and colleagues our findings thus seem to indicate that when customers reject a dissatisfactory product there is no additional positive recovery effect once the overcompensation crosses a certain point, but it is so far impossible to draw a firm conclusion regarding the location of this particular point, and the effectiveness of overcompensation after this point (flat or declining).

In a between-subjects, each subject judges only one single compensation level. By using a within-subjects design in which the same subjects have to judge multiple compensation levels, more fine-grained analyses can be conducted. Based on the evaluability framework, customers are expected to be more sensitive to differences in overcompensation sizes

when they evaluate multiple compensation levels than when they are confronted with only one compensation level (see Hsee, 1996; Hsee, Loewenstein, White & Bazerman, 1999; Hsee & Zhang, 2010).

In this regard, Bazerman, Loewenstein, and White (1992) have made an important distinction between two methods that can be used to evaluate multiple alternatives, that is, subjects can be forced to choose one preferred option among two or more alternatives, or be asked to judge multiple alternatives separately. In the next study, we used the first method in which subjects had to judge different compensation levels in pairs, and indicate which of the two levels they preferred. Such a method of paired comparisons allows an explicit comparison of many different compensation levels as well as the estimation of a curve that visually displays the nature of the relationship between the level of overcompensation and the degree of customer loyalty. Moreover, this method also provides a useful way to determine the optimal level of overcompensation that results in the highest degree of customer loyalty.

3 Study 2

3.1 Method

3.1.1 Subjects and Design

A total of 19 undergraduate university students (3 men, 16 women, $M_{age} = 22.89$, $SD = 3.81$) of different faculties (i.e., psychology and educational sciences, political and social sciences, arts and philosophy, medicine and health sciences, and law) participated in this study in exchange for payment. In the current study, the compensation levels ranged from 100% up till 200% of the purchase price of a dissatisfactory product, in small steps of 5%. This implies that in total 21 compensation levels were included.

3.1.2 Procedure

Students were invited in groups of four. Upon arrival to the laboratory, subjects were presented with a written scenario in which they were asked to imagine that they had bought a new digital photo camera at a nearby store for €100 (worth \$106 at the time that the study was conducted). Subjects were then informed that when they came home the camera turned out to be broken. The store decided to financially compensate for this malfunctioning. Next, subjects were asked to evaluate different compensations which the store could use to respond to this product failure.

The method of paired comparisons splits the ordering process into a series of evaluations carried out on two objects at a time. For each of these pairs, a decision is made which of the two objects is preferred (for more detailed information on this method, see Hatzinger & Dittrich, 2012; see also David,

1963; Thurstone, 1927). In the context of the present study, the objects were embodied by the 21 included compensation levels, which resulted in a total of 210 pairwise comparisons for each subject to complete. These pairs were presented to subjects in a different random order for each subject.

3.1.3 Measures

For each of the 210 comparisons, subjects were asked to answer the following question: “After which of the following two compensations are you the most willing to buy products at this store again?” (item based on the repeat purchase intention item of Garrett, 1999). Because repurchase intention can be seen as a central dimension of customer loyalty (see Lam et al., 2004; Webster & Sundaram, 1998), we used this specific item as an index for the customer loyalty construct.

3.2 Results

A simple preference scale was constructed to numerically describe perceived preference for each compensation level. This scale was estimated through a Bradley-Terry model using the R package Prefmod (Hatzinger & Dittrich, 2012). Bradley-Terry models are a variant of loglinear models (Dittrich, Hatzinger & Katzenbeisser 1998; Sinclair, 1982) which assume that, given J objects, the observed number of times in which object j was preferred over object k follows a Poisson distribution. The location of each object on the preference scale is estimated in a worth parameter π_j that can be estimated through the function:

$$p(j > k | \pi_j, \pi_k) = \frac{\pi_j}{\pi_j + \pi_k} \quad (1)$$

Although these models allow us to test whether the preference for each compensation level differs from the preference for another compensation level, they assume that the objects being compared are categorical in nature and hence do not allow us to test directly for a linear or non-linear effect of compensation level on preference. However, as depicted in Figure 2, the estimated worth values of each compensation level clearly suggest an inverted U-relation. That is, customer loyalty increased up to a compensation level of 140%. After this optimal level, customer loyalty clearly declined.

3.3 Discussion

The present study provides some initial evidence for the predicted inverted U-curve between level of overcompensation and degree of customer loyalty. Especially, in the present study the ideal overcompensation level emerged at 140% of the purchase price of the dissatisfactory product. After overcompensation exceeded this threshold, its effectiveness as a means to enhance customer loyalty seems to deteriorate. Hence, the present study's findings suggest that too much compensation can indeed affect customer loyalty negatively.

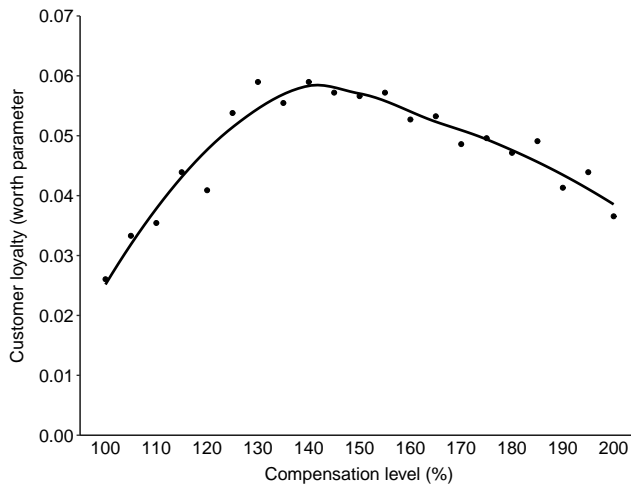


FIGURE 2: Relationship between compensation level and customer loyalty in Study 2. Worth parameter: Given two compensation levels j and k , the probability that compensation level j is preferred over compensation level k is given by the worth of j divided by the sum of the worth of j and the worth of k . The line represents a loess-curve fitted to the predicted worth values for visualization purposes.

The next study was designed with the aim to replicate the present findings using a different study method, in which subjects had to rate each compensation level separately instead of in pairs (i.e., a standard within-subjects design), that allows us to statistically test the linear and quadratic components of the compensation-loyalty relationship. Moreover, scholars have argued that when the magnitude of the failure in financial terms is high, customers might react differently to the compensation than when the magnitude is low (see Garrett, 1999; Smith, Bolton & Wagner, 1999). Therefore, in the next study we also included several products – ranging in purchase price from \$5 to \$500 – in order to test whether we could replicate the inverted U-relationship between overcompensation and customer loyalty for different failure magnitudes.

Importantly, an inverted U-relation may point toward the existence of two opposing mechanisms that jointly operate (Coombs & Avrunin, 1977). For instance, in the context of social groups, it has been argued that people prefer membership of moderately sized minorities rather than either small minorities or large majorities, because it balances the need for belonging – which implies a positive relation between group size and preference – and the need for distinctiveness – which implies a negative relation between group size and preference (Leonardelli, Pickett & Brewer, 2010). Alternatively, an inverted U-curve may arise when a sample consists of subsamples with different relations, and the resulting general trend may just be the mere mean tendency of distinctive patterns. Therefore, in the next study we also explored individual differences in customers' reactions to growing levels

of overcompensation.

4 Study 3

4.1 Method

4.1.1 Subjects and Design

A total of 251 US citizens (138 men, 113 women, $M_{age} = 33.95$, $SD = 10.46$), recruited through Amazon Mechanical Turk, completed this study in exchange for payment. Eighteen subjects (7.2%) were excluded from further analyses because they failed on our check questions. We employed a mixed-factorial design in which we included seven different compensation amounts as the within-factor (compensation level: 100%, 125%, 150%, 175%, 200%, 225%, and 250% of the purchase price) and 12 different products that were nested within four different price classes as the between-factor (product price and product type: \$5: kilo tomatoes, book, pair of socks; \$50: blender, sweatshirt, bottle of wine; \$100: pair of shoes, espresso machine, coffee table; and \$500: television, watch, dining table).

4.1.2 Procedure

Subjects were presented with a written scenario in which they were asked to imagine that they had bought one of these 12 different products at a nearby store, and that it turned out that their purchase was damaged or malfunctioning. Subjects were then asked to imagine that they returned to the store to complain about this product failure. Subsequently, subjects evaluated seven responses by which the store could react to this failure. Each of these reactions presented a specific compensation level. In the present study, the different compensation levels were offered in ascending order. Customer loyalty was measured with the same four items as in Study 1.

4.2 Results

4.2.1 Curve Progression

We analyzed the effect of compensation level on customer loyalty – an index created by aggregating the return, repurchase, recommend, and patronage items. A one-way repeated measures ANOVA on customer loyalty showed that the compensation levels of 100%, 225%, and 250% all lead to lower customer loyalty than the compensation levels of 125% to 200% (all $ps < .001$), which supports the notion that loyalty increases with higher compensation up to a certain point, after which it decreases again. In fact, loyalty for the compensation levels of 100%, 225% and 250% did not significantly differ from each other (all $ps > .18$). Figure 3 visualizes the relationship between the level of compensation and the degree of customer loyalty.

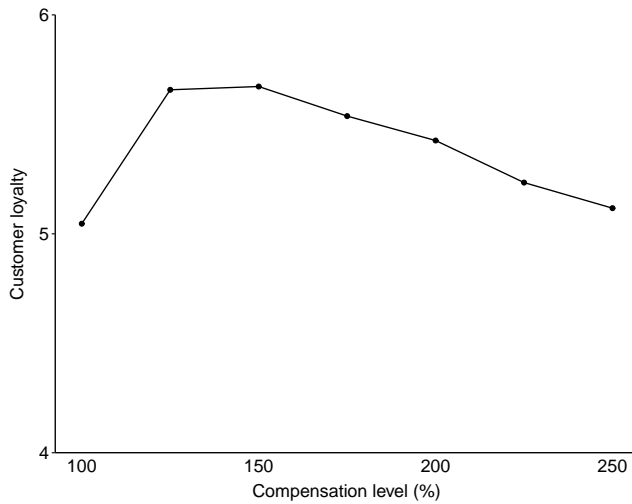


FIGURE 3: Relationship between compensation level and customer loyalty in Study 3. The graph is based on the observed means (collapsed across product prices): $M_{100\%} = 5.05, SD = 1.60$; $M_{125\%} = 5.66, SD = 1.39$; $M_{150\%} = 5.67, SD = 1.54$; $M_{175\%} = 5.54, SD = 1.68$; $M_{200\%} = 5.43, SD = 1.85$; $M_{225\%} = 5.23, SD = 2.02$; $M_{250\%} = 5.12, SD = 2.12$.

To examine the inverted U-relation in greater depth, we analyzed the data through multilevel regression in Mplus, with observations (level 1) nested in subjects (level 2). We treated the independent variable, level of compensation, as a quantitative variable in our analyses and we estimated the functional form of its effect by considering both a linear and a quadratic trend. To eliminate problems associated with small parameter estimates, we rescaled the compensation levels (100% to 250%, in steps of 25%) to an index variable (1 to 7). This linear transformation did not affect any substantial result or statistical test. Finally, we included the effect of product price (\$5, \$50, \$100, and \$500) using three dummy variables with the highest price being the reference category.

Because the data are multilevel, the Cronbach alpha of customer loyalty can be estimated at the between and the within levels. The analyses revealed that both are very high (alpha = .99 and alpha = .96, for respectively the between and the within level). In our first model, we tested whether the relation between level of compensation and customer loyalty is moderated by product price by including interactions between the three dummy variables and both the linear and quadratic trend for level of compensation. We found that none of the product price dummies interacted with the linear (all $ps > .35$) or the quadratic trend (all $ps > .33$). In addition, none of the three dummy variables themselves had a significant effect (all $ps > .78$). We therefore collapsed our data across price levels. The subsequent analysis revealed a significant linear ($t(1396) = 5.49, p < .001$) and quadratic trend ($t(1396) = 7.44, p < .001$). This analysis further indicates

that as the compensation level increased to about 168%, customer loyalty became more favorable, but it started to become less favorable after the 168% compensation level.

Finally, to formally test the existence of an inverted U-relation, we estimated in one overall analysis a model that approximates the quadratic relation with two linear relations (Simonsohn, 2016). Specifically, we estimated one linear relation on the basis of the data for the first three compensation levels and a second linear relation was estimated on the remaining four levels, by introducing a breakpoint that allowed for a different intercept and slope for the two regression lines. We selected this breakpoint because our previous analysis indicated that the 168% compensation is the point with the highest customer loyalty – this optimal point lies between the third and fourth compensation level. An inverted U-relation is formally present if the slope of the first regression line is significantly positive and the slope of the second regression line is significantly negative (and significantly different from the slope of the first regression line; Simonsohn, 2016). Our results clearly support the existence of an inverted U: The slope of the regression covering compensation levels from 100% to 150% was significantly positive ($b = .31, t(1396) = 5.48, p < .001$), the slope of the regression covering compensation levels from 175% to 250% was significantly negative ($b = -.14, t(1396) = 5.46, p < .001$), and both slopes differed significantly ($t(1396) = 7.88, p < .001$).

4.2.2 Individual differences

To examine whether there are indeed individual differences in how customers react to increasing levels of overcompensation, we ran several additional multilevel models. First, we extended the random-intercept model (Model 1) described

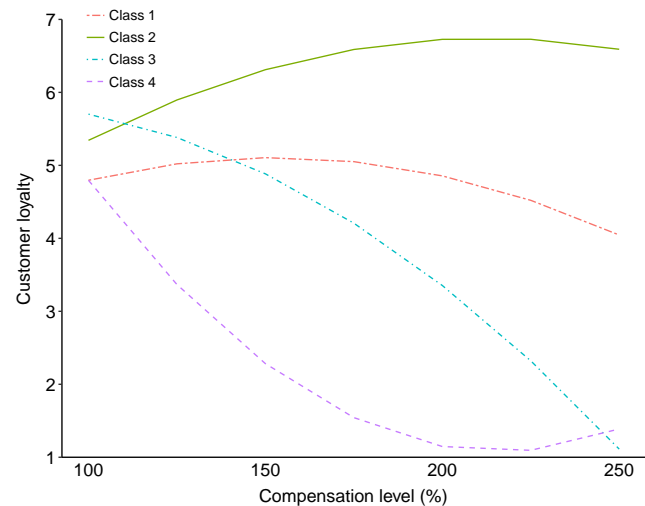


FIGURE 4: Four different customer reactions to overcompensation in Study 3. The graph is based on the estimated means.

TABLE 1: Estimated multilevel mixture models in Study 3.

Model	Description	BIC	Lo-Mendell-Rubin Adjusted LRT Test	Entropy
1	Random Intercept	5526.41	-	-
2	Random slope: 1 class	4400.42	-	-
3	Random slope: 2 classes	4341.29	85.82, $p < .001$.870
4	Random slope: 3 classes	4280.80	79.29, $p = .028$.938
5	Random slope: 4 classes	4259.19	49.60, $p = .028$.936
6	Random slope: 5 classes	4269.93	60.32, $p = .10$.938

TABLE 2: Parameter estimates (β s) for the four classes of individual differences in Study 3.

Class #	% of sample	Intercept	Comp.	Comp. ²
1	25.3	4.43	0.44	-0.07
2	57.1	4.65	0.76	-0.07
3	11.2	5.84	-0.05	-0.09
4	6.4	6.57	-1.94	0.17

above to a random-slopes model (Model 2). This model allows the parameter for both the linear and the quadratic component of the relation between compensation and loyalty to vary across subjects, but the individual parameters are assumed to be drawn from an overall normal distribution of parameters. In other words, even though there may be some variation across subjects, the random-slopes model assumes that the subjects represent a fairly homogeneous group. We therefore also estimated multilevel mixture models that assume that the subjects are drawn from two (Model 3), three (Model 4), four (Model 5), or five (Model 6) latent classes. Table 1 gives the BIC values for the different models (lower values are better), as well as the test for the improvement in fit resulting from adding latent classes and, for models with more than one latent class, the entropy measure (which is a 0 to 1 measure that indicates the ease of classifying subjects in the different classes with higher numbers representing better solutions).

The best-fitting model was a model with four latent classes: It had the lowest BIC and showed similar levels of entropy as the models with three and five latent classes. Moreover, the Lo-Mendell-Rubin test indicated that a model with four latent classes represented a significant improvement over a model with three classes, while a model with five classes was not significantly different from a model with four classes. Table 2 gives the parameter estimates for the four classes; Figure 4 shows the corresponding regression curves for each class.

There is little indication of an inverted U-function in any separate latent class (see Figure 4). Classes 3 and 4 showed a

negative reaction to overcompensation, and differed only in how fast reactions became negative with increasing overcompensation. Consumers in Class 1 initially did not respond strongly to overcompensation, but their reactions became more negative when the overcompensation was enlarged. Finally, the largest class (Class 2) consisted of consumers who responded positively to overcompensation, but their positive reactions leveled out (i.e., reached an asymptote) for very high levels of overcompensation. It is not clear, however, whether this leveling off was legitimate or rather due to a ceiling effect. Note that in none of the four classes there was a positive effect of extra compensation for the highest overcompensation levels.

4.3 Discussion

The present study provides strong evidence for the general inverted U-shaped relationship between the level of overcompensation and the degree of customer loyalty, and this relationship holds for high and low failure magnitudes. More precisely, over the different product prices the optimal level of overcompensation was constantly situated around a compensation level that is equal to approximately 168% of the purchase price. Note that this threshold is somewhat higher than in the previous study, in which the ideal compensation level was already reached at the level of 140%. After this threshold, the curve decreased and the largest overcompensation levels (i.e., beyond 200%) even negatively affected customer loyalty. Moreover, our individual difference analysis revealed that four classes of customer reactions to increasing overcompensation could be identified, and in none of these classes this general pattern was observed. This result implies that the general inverted U-shape represents merely an average tendency across groups instead of a “real” psychological reaction that is shared by all consumers. In other words, customers do not react universally to different levels of overcompensation, as some react positive and others negative. However, and most importantly, all groups showed stagnation or a decline in loyalty at the higher ends of the range of overcompensations. The differences between classes are thus especially pronounced at the lower end of the overcom-

pensation continuum, with some classes showing increased loyalty at this point, and others decreased loyalty.

Two limitations of the present study should be acknowledged. First, in the current study the overcompensation range (in steps of 25%) was rather large, and thus not very sensitive to unravel the optimal level of overcompensation. To overcome this limitation, in the next study we investigated the continuum using a much finer range, in small steps of only 10%. These more fine grained steps might shed a different light on the operation of individual differences in the context of mild overcompensations, which shows the greatest variability. Secondly, in the present study the compensation levels were presented to subjects in a fixed order. In order to avoid potential sequential effects, the compensation levels were randomized in the next study.

5 Study 4

5.1 Method

5.1.1 Subjects and Design

The sample consisted of 128 US citizens (62 men, 66 women, $M_{age} = 36.46$, $SD = 12.32$), who were recruited through Amazon Mechanical Turk and participated in this scenario study in exchange for payment. Fourteen subjects (10.9%) were excluded from further analyses because they failed on our check questions. To administer our compensation manipulation we employed a within-subjects design in which we included eight compensation levels (i.e., 100%, 110%, 120%, 130%, 140%, 150%, 160%, and 170% of the purchase price). Because the prior study showed there was no further increase in customer loyalty for overcompensations beyond the level of 168% (which was identified as the optimum), we did not include compensation sizes beyond this particular level in the present study.

5.1.2 Procedure

Subjects read a scenario in which they imagined that they had bought a new espresso machine at a nearby store for the price of \$100. In the present study we only included one product price, because in the previous study the compensation-loyalty relationship was not affected by the magnitude of the product failure. Subjects imagined themselves that they came home and then realized that their espresso machine did not function properly. They thus decided to go back to the store to complain about this malfunctioning. Subjects were asked to evaluate eight responses by which the store could react to this situation; each of these reactions presented a specific compensation level. Importantly, the different compensation levels were presented in a random order.

5.1.3 Measures

We used the same four items as in Study 1 to measure customer loyalty. In addition, to measure whether the compensation level manipulation was successful, we also probed subjects' perception of the magnitude of the compensation. Therefore, we asked subjects for each of the compensation levels: "To what extent do you find this compensation large?" (1 = not at all, 7 = very much).

5.2 Results

Similar to Study 3, most analyses were conducted using Mplus software. We again treated the independent variable, level of compensation, as a quantitative variable and we estimated the functional form of its effect by considering both a linear and a quadratic trend, using a regression approach. Because every subject responded to eight different compensation levels, we used a multilevel regression model with observations (level 1) nested in subjects (level 2). To eliminate problems associated with small parameter estimates, we rescaled the compensation levels (100% to 170%) to an index variable (1 to 8). As in the previous study, this linear transformation did not affect any substantial result or statistical test.

5.2.1 Perception of Compensation Size

As a manipulation check, we first tested the effect of compensation level on perception of compensation size. The analysis revealed both a significant linear ($t(796) = 8.95$, $p < .001$) and quadratic trend ($t(796) = 4.74$, $p < .001$) for the relation between compensation level and size perception. Figure 5 reveals that individuals tend to view less difference between adjacent compensation levels as the compensation size becomes larger. This finding is in line with a host of research on the mental number line, showing a logarithmic relation between numbers and their mental representation (e.g., Dehaene, 1992; Nieder & Miller, 2003).

5.2.2 Curve Progression

We subsequently analyzed the effect of compensation level on customer loyalty, which was again created on the basis of the repurchase, return, recommend, and patronage items ($\alpha = .99$ and $\alpha = .97$, for respectively the between and the within level). A one-way repeated measures ANOVA showed a significantly lower loyalty level for the compensation of 100% than for the other compensation levels (all $ps < .001$). Loyalty for the compensation level of 110% was significantly lower than for all the levels up to 160% (all $ps < .05$), and marginally different from the compensation level of 170%. Loyalty for the compensation level of 120% was significantly lower than for all the levels up to 150% (all $ps < .05$), but not different from the compensation levels of 160%

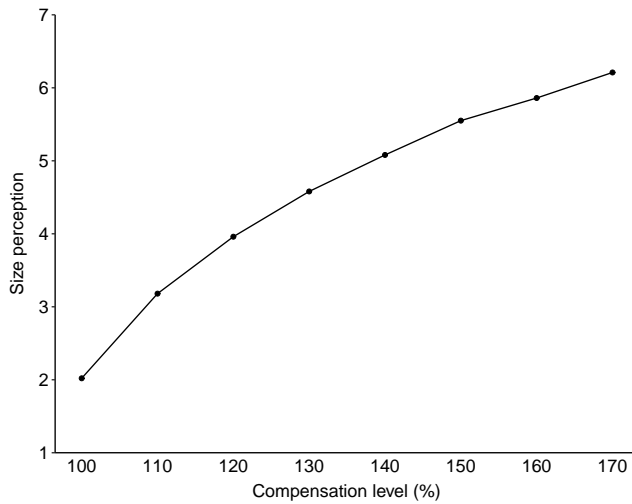


FIGURE 5: Relationship between compensation level and size perception in Study 4. The graph is based on the observed means: $M_{100\%} = 2.02, SD = 1.76; M_{110\%} = 3.18, SD = 2.14; M_{120\%} = 3.96, SD = 1.97; M_{130\%} = 4.58, SD = 2.04; M_{140\%} = 5.08, SD = 1.79; M_{150\%} = 5.55, SD = 1.68; M_{160\%} = 5.86, SD = 1.66; M_{170\%} = 6.21, SD = 1.42$.

and 170% (all $ps > .26$). Loyalty for the compensation levels from 130% to 170% did not significantly differ among each other (all $ps > .10$). This analysis thus reveals evidence for an increasing positive reaction to overcompensation, which leveled off around compensation levels of 130%. As could be expected, the small range of overcompensations precluded us to substantiate the presence of an overall inverted U-reaction (see Figure 6).

We conducted a subsequent multilevel regression in Mplus to identify the optimal overcompensation level. This analysis revealed both a significant linear ($t(796) = 5.05, p < .001$) and quadratic trend ($t(796) = 4.93, p < .001$). Here, the optimal compensation level that resulted in the highest loyalty rating was identified at a compensation level of 146%.

5.2.3 Individual Differences

To examine the presence of meaningful individual differences in the reactions to the various overcompensation levels, we ran several multilevel models. As in the prior study we first ran a random-intercept model (Model 1) and a random-slopes model (Model 2). Again, we also estimated multilevel mixture models that assume that the subjects are drawn from two (Model 3), three (Model 4), or four (Model 5) latent classes. Table 3 gives the BIC values for the different models, the test for the improvement in fit resulting from adding latent classes, and the entropy measure.

The model with two latent classes was selected as the best-fitting model. It had the second lowest BIC and almost the same entropy as the model with three latent classes. Moreover, the Lo-Mendell-Rubin test indicated that a model

with two classes represented a significant improvement over a model with only one class, but the model with three classes was not better compared to the model with two classes. Moreover, the results of the three latent classes model revealed that the additional class consisted of only 2.6% of the subjects, and that the other classes were basically similar as those from the two-cluster solution. Table 4 gives the parameter estimates for the two classes; Figure 7 shows the corresponding regression curves for each class.

As in Study 3, the largest class (Class 1) consisted of consumers who responded positively to overcompensation, but again their positive reactions leveled out (i.e., reached an asymptote) for higher levels of overcompensation. In this case, this leveling off does not seem to signal a ceiling effect, as there was still some room for more positive evaluations. Class 2 showed a negative reaction to overcompensation, which became even more negative with increasing levels of overcompensation.

5.3 Discussion

In the current study we investigated the overcompensation continuum with smaller steps of 10%. Here, the optimum overcompensation level was reached at a compensation level that is equivalent to about 146% of the purchase price. Beyond this point customer loyalty again flattened. The use of moderate overcompensation levels precluded the presence of a downstream curve. Again, our findings revealed individual differences in how people evaluate different compensation

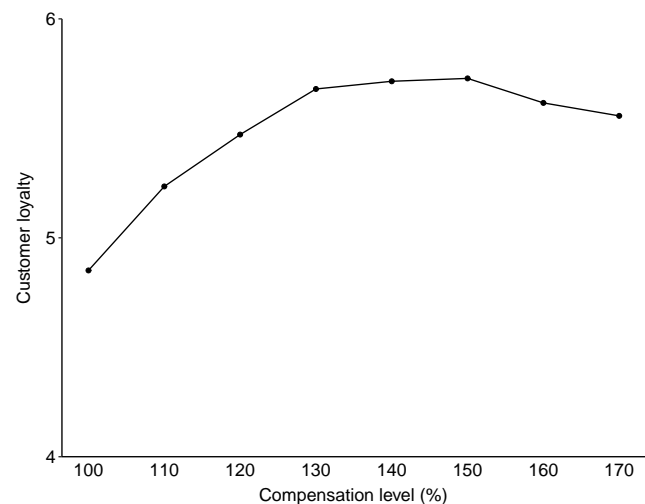


FIGURE 6: Relationship between compensation level and customer loyalty in Study 4. The graph is based on the observed means: $M_{100\%} = 4.85, SD = 1.84; M_{110\%} = 5.23, SD = 1.70; M_{120\%} = 5.47, SD = 1.65; M_{130\%} = 5.68, SD = 1.59; M_{140\%} = 5.71, SD = 1.56; M_{150\%} = 5.73, SD = 1.56; M_{160\%} = 5.61, SD = 1.73; M_{170\%} = 5.56, SD = 1.81$.

TABLE 3: Estimated multilevel mixture models in Study 4.

Model	Description	BIC	Lo-Mendell-Rubin Adjusted LRT Test	Entropy
1	Random Intercept	3002.02	-	-
2	Random slope: 1 class	2602.83	-	-
3	Random slope: 2 classes	2582.92	45.51, $p = .034$.908
4	Random slope: 3 classes	2576.60	32.39, $p = .58$.937
5	Random slope: 4 classes	2584.92	18.60, $p = .79$.885

TABLE 4: Parameter estimates (β s) for the two classes of individual differences in Study 4.

Class #	% of sample	Intercept	Comp.	Comp. ²
1	84.2	4.80	0.44	-0.03
2	15.8	4.36	0.06	-0.04

levels. As in the prior study, most consumers reacted positively to increasing overcompensation, at least to a certain level. In the present study not less than 84.2% of the customers showed this pattern, which is consistent with Study 3. Indeed, in Study 3 Classes 1 and 2, which included 82.4% of the subjects, also showed higher loyalty levels in the low range of overcompensations. In the present Study a smaller proportion of customers (15.8%) responded negatively to all forms of overcompensation, which mirrors the behavior of customers included in Classes 3 and 4 of Study 3 (17.6%), who showed a similar pattern.

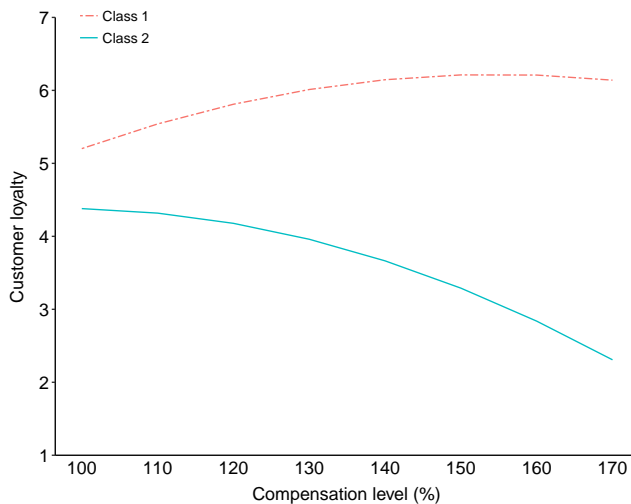


FIGURE 7: Two different customer reactions to overcompensation in Study 4. The graph is based on the estimated means.

6 General Discussion

When products fail to live up to customers’ expectations, companies can financially compensate these customers for their loss. Companies often choose to provide dissatisfied customers more compensation than required to undo the failure with the aim to further increase their loyalty. The aim of the present paper was to investigate in detail the effectiveness of monetary overcompensation as a means to enhance customer loyalty. The current literature is unclear whether, in the high overcompensation range, a saturation effect (leading to a flattening curve) or a true negative effect (resulting in a downstream curve) occurs. Moreover, because it can be expected that customers do not react universally to increasing amounts of overcompensation, we also included a thorough analyses of individual differences.

6.1 Main Conclusions

Across three studies the optimal level of overcompensation was always located around a compensation level that is equivalent to an average of about 150% of the purchase price of the faulty product (i.e., 140% in Study 2, 168% in Study 3, and 146% in Study 4). Note that in Study 1, which asked subjects to provide ratings for only one compensation level, this optimum seems to be located further along the continuum. Taken into account that overcompensation is characterized by an open-ended interval which has no natural upper boundary, it can be concluded that the optimum level is situated at the rather low end of the continuum. Importantly, after this ideal point had been reached, the effect of overcompensation on customer loyalty was limited – and for more extreme overcompensation levels there was even an actual decrease in customer loyalty, which sharply contrasts with the standard economic notion that increasing levels of compensation would continue to produce higher levels of customer loyalty. As such, the present research has established the existence of an overall inverted U-relation between the amount of overcompensation and the degree of customer loyalty. These results corroborate ample previous compensation research that failed to report favorable effects of large overcompensation relative to equal compensation (e.g., Estelami & De Maeyer, 2002; Garrett, 1999; Haesevoets et al., 2013, 2014; Noone & Lee, 2011).

We hypothesized that an inverted U-curve may arise because there are subsamples of customers that react differently to increasing levels of overcompensation. In line with the idea that humans are economic men, in both studies about 80% of the customers reacted positively to overcompensation by increasing their loyalty when the provided overcompensation enlarged, but this was only up to a certain point after which the curve flattened. Hence, even for customers who reacted positively to increasing overcompensation this effect was bounded.

The overall decline in the high overcompensation range seems to be due to a smaller group of customers (which included approximately 20% of all customers) who reacted negatively to every form of overcompensation. Importantly, most of these customers' reactions became even more negative with increasing overcompensation. Our individual difference analyses thus entail that customers do not react universally to various overcompensations, but instead there is a large subgroup of customers that react positively and a smaller segment of customers that react negatively to increasing levels of overcompensation. Importantly, however, what seems to be universal is that all customer groups show stagnation or a decline in loyalty at the higher ends of the range of overcompensations, which further substantiates the central finding that high overcompensations do not yield any beneficial effect on loyalty.

Because in both studies there was no indication of an inverted U-function for the separate classes, the general curve represents an average tendency rather than a genuine psychological reaction. For instance, we reasoned that returning a faulty product is associated with additional costs for the customer in terms of lost time and experienced inconveniences. Because of these additional costs, we argued that overcompensation should transcend the mere product price of a dissatisfactory product in order to further elicit loyalty. But after this level of overcompensation is reached, loyalty levels should drop. Whereas this reasoning seems valid on the basis of the general curve across groups, close inspection of the specific curves in each of the four classes identified in Study 3 and the two classes in Study 4 revealed no such pattern. The absence of this curve in specific groups suggests that customers do not think in terms of such additional costs, or at least that such costs are not explicitly taken into account when making loyalty judgments.

6.2 Practical Implications of the Present Research

Despite these robust individual differences in customers' reactions to various overcompensation levels, the general data pattern which consists of an inverted U still holds some important practical implications for companies, who often have no information regarding how an individual customer will react to a certain compensation level, and as such have to rely

on general trends in customers' reactions.

Overcompensating dissatisfied customers entails high costs for companies because it is associated with incremental expenses. As our findings revealed that, in general, overcompensation has beneficial effects on customer loyalty only at the low end of the overcompensation continuum, the present research cautions companies against attempt to differentiate themselves by overcompensating customers for product failures. Companies should be aware that when the overcompensation exceeds the original purchase price with more than 50%, they are generally wasting money which does not further enhance loyalty for the largest group of customers, but instead even results in a decline for about one fifth of their customers. As such, more extreme overcompensations are not only not cost-effective but actually even cost-ineffective for companies. Knowledge of this upper threshold after which more compensation becomes too much is of vital importance as it will enable companies and marketers to realize an optimal allocation of their marketing budget and avoid inefficient spending on too large overcompensation.

Companies may be concerned about the costs and returns of overcompensation strategies. In this regard, it must be noted that although mild overcompensation generally has a significant positive influence on customer loyalty, the additional benefit on top of equal compensation is rather small. Indeed, corroborating previous compensation research (see Davidow, 2003; Gelbrich & Roschk, 2011, for overviews), our results revealed that for most customers equal compensation already resulted in a rather favorable situation in terms of loyalty. A relevant question, therefore, is whether this rather small increase in customer loyalty is worth the extra cost that overcompensation entails. An overcompensation of 150%, for example, holds that, in addition to the reimbursement of the expenses, the company offers the customer an extra amount that is half as large as the damage suffered. This might not be a problem for companies when the magnitude of the failure is low, but when the monetary value of a dissatisfactory product is high, as in the automobile sector, the costs of overcompensation in absolute terms rapidly increase. The question whether overcompensation is a cost-effective repair strategy is one that each company should answer for itself; and the answer to this question might depend on other factors such as the competitiveness of the market and the status of the client (regular versus occasional customer).

6.3 Strengths, Limitations, and Recommendations

First of all, an important strength of the present research is that we used different methods of data collection as well as different study samples. That is, in Study 1 we used a between-subjects design to deliver the different compensation levels. In contrast, in Study 2 we employed the method

of paired comparisons, whereas in Studies 3 and 4 subjects rated each presented compensation level separately. In Studies 1, 3, and 4 the sample consisted of consumers that were recruited through Amazon's Mechanical Turk. Study 2 was conducted among undergraduate university students. The fact that we could replicate the diminished effectiveness of large overcompensation using this divergence in methods, designs, and samples enlarges our confidence in the robustness of the reported findings.

A second strength of the present research is that we focused on customer loyalty as the outcome variable. Many previous compensation studies mainly focused on post-complaint satisfaction, a construct that has been defined very differently across different studies (Olsen & Johnson, 2003). Although we acknowledge that satisfaction is an important aspect of the recovery process, we believe that it is at least equally important to companies that customers are willing to recommend the company to others and to purchase products again – two critical elements of customer loyalty (Lam et al., 2004; Webster & Sundaram, 1998).

A limitation of our research is that we relied on scenario-based experiments in which subjects had to imagine receiving different amounts of compensation from a company. As with all research methodologies, scenarios yield advantages and disadvantages (Carlsmith, Ellsworth & Aronson, 1976). An important advantage of this method is that it enhances internal and statistical conclusion validity by controlling manipulated variables and by reducing random noise in the outcome measure (Cook & Campbell, 1979; Churchill, 1995). Yet, imagining receiving compensation might differ from actually receiving compensation. Future research should thus investigate whether the present results also apply when customers actually receive different levels of overcompensation in a field setting (cf. Garrett, 1999).

As a closing remark, we would like to mention that an important factor that may influence customers' reactions towards overcompensation is whether a company recalls a defective product or whether the customer him- or herself has to detect that a product is defective. In this light, it can be expected that the costs for the customer may be lower when the company recalls a product, because under such circumstances a part of the fault-finding expenses and inconveniences have already been carried out by the company. As such, the optimal compensation level might also be smaller when companies themselves recall faulty products, and therefore be located earlier on the overcompensation continuum. We believe that the investigation of overcompensation effects under such conditions provides an interesting avenue for future compensation research.

References

- Bazerman, M. H., Loewenstein, G. F., & White, S. B. (1992). Reversals of preference in allocation decisions: Judging an alternative versus choosing among alternatives. *Administrative Science Quarterly*, 37, 220–240. <http://dx.doi.org/10.2307/2393222>.
- Blount, S. (1995). When social outcomes aren't fair: The effect of causal attributions on preferences. *Organizational Behavior and Human Decision Processes*, 63, 131–144. <http://dx.doi.org/10.1006/obhd.1995.1068>.
- Boshoff, C. (1997). An experimental study of service recovery options. *International Journal of Service Industry Management*, 8, 110–130. <http://dx.doi.org/10.1108/09564239710166245>.
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk a new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6, 3–5. <http://dx.doi.org/10.1177/1745691610393980>.
- Butcher, K., Sparks, B., & O'Callaghan, F. (2002). Effect of social influence on repurchase intentions. *Journal of Services Marketing*, 16, 503–514. <http://dx.doi.org/10.1108/08876040210443382>.
- Camerer, C., & Thaler, R. H. (1995). Anomalies: Ultimatums, dictators and manners. *The Journal of Economic Perspectives*, 209–219. <http://dx.doi.org/10.1257/jep.9.2.209>.
- Carlsmith, J. M., Ellsworth, P., & Aronson, E. (1976). *Methods of research in social psychology*. Reading, MA: Addison-Wesley Publishing Company.
- Churchill, G. A. (1995). *Marketing research: Methodological foundations*. Fort Worth, TX: Dryden Press.
- Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design and analysis for field settings*. Chicago, IL: Rand McNally.
- Coombs, C. H., & Avrunin, G. S. (1977). Single-peaked functions and the theory of preference. *Psychological Review*, 84, 216–230. <http://dx.doi.org/10.1037/0033-295X.84.2.216>.
- Dana, J., Cain, D. M., & Dawes, R. M. (2006). What you don't know won't hurt me: Costly (but quietly) exit in dictator games. *Organizational Behavior and Human Decision Processes*, 100, 193–201. <http://dx.doi.org/10.1016/j.obhdp.2005.10.001>.
- David, H. A. (1963). *The method of paired comparisons* (Vol. 12). London: Griffon.
- Davidow, M. (2003). Organizational responses to customer complaints: What works and what doesn't. *Journal of Service Research*, 5, 225–250. <http://dx.doi.org/10.1177/1094670502238917>.

- Dawes, R. M., & Thaler, R. H. (1988). Anomalies: cooperation. *The Journal of Economic Perspectives*, 2, 187–197. <http://dx.doi.org/10.1257/jep.2.3.187>.
- Dehaene, S. (1992). Varieties of numerical abilities. *Cognition*, 44, 1–42. [http://dx.doi.org/10.1016/0010-0277\(92\)90049-N](http://dx.doi.org/10.1016/0010-0277(92)90049-N).
- Dittrich, R., Hatzinger, R., & Katzenbeisser, W. (1998). Modelling the effect of subject-specific covariates in paired comparison studies with an application to university rankings. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 47, 511–525. <http://dx.doi.org/10.1111/1467-9876.00125>.
- Estelami, H., & De Maeyer, P. (2002). Customer reactions to service provider overgenerosity. *Journal of Service Research*, 4, 205–216. <http://dx.doi.org/10.1177/1094670502004003004>.
- Garrett, D. E. (1999). The effectiveness of compensation given to complaining customers: Is more better? *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, 12, 26–34.
- Gelbrich, K., Gäthke, J., & Grégoire, Y. (2015). How much compensation should a firm offer for a flawed service? An examination of the nonlinear effects of compensation on satisfaction. *Journal of Service Research*, 18, 107–123. <http://dx.doi.org/10.1177/1094670514543149>.
- Gelbrich, K., & Roschk, H. (2011). Do complainants appreciate overcompensation? A meta-analysis on the effect of simple compensation vs. overcompensation on post-complaint satisfaction. *Marketing Letters*, 22, 31–47. <http://dx.doi.org/10.1007/s11002-010-9101-6>.
- Gilly, M. C., & Hansen, R. W. (1985). Consumer complaint handling as a strategic marketing tool. *Journal of Consumer Marketing*, 2, 5–16. <http://dx.doi.org/10.1108/eb008139>.
- Grewal, D., Roggeveen, A. L., & Tsiros, M. (2008). The effect of compensation on repurchase intentions in service recovery. *Journal of Retailing*, 84, 424–434. <http://dx.doi.org/10.1016/j.jretai.2008.06.002>.
- Haesevoets, T., Reinders Folmer, C., De Cremer, D., & Van Hiel, A. (2013). Money isn't all that matters: The use of financial compensation and apologies to preserve relationships in the aftermath of distributive harm. *Journal of Economic Psychology*, 35, 95–107. <http://dx.doi.org/10.1016/j.joep.2013.02.003>.
- Haesevoets, T., Van Hiel, A., Reinders Folmer, C., & De Cremer, D. (2014). What money can't buy: The psychology of financial overcompensation. *Journal of Economic Psychology*, 42, 83–95. <http://dx.doi.org/10.1016/j.joep.2014.02.001>.
- Hatzinger, R., & Dittrich, R. (2012). Prefmod: An R package for modeling preferences based on paired comparisons, rankings, or ratings. *Journal of Statistical Software*, 48, 1–31. <http://dx.doi.org/10.18637/jss.v048.i10>.
- Hauser, D. J., & Schwarz, N. (2016). Attentive Turkers: MTurk participants perform better on online attention checks than do subject pool participants. *Behavior Research Methods*, 48, 400–407. <http://dx.doi.org/10.3758/s13428-015-0578-z>.
- Hocutt, M. A., Bowers, M. R., & Donavan, D. (2006). The art of service recovery: fact or fiction? *Journal of Services Marketing*, 20, 199–207. <http://dx.doi.org/10.1108/08876040610665652>.
- Hsee, C. K. (1996). The evaluability hypothesis: An explanation for preference reversals between joint and separate evaluations of alternatives. *Organizational Behavior and Human Decision Processes*, 67, 247–257. <http://dx.doi.org/10.1006/obhd.1996.0077>.
- Hsee, C. K., Loewenstein, G. F., White, S. B., & Bazerman, M. H. (1999). Preference reversals between joint and separate evaluations of options: A review and theoretical analysis. *Psychological Bulletin*, 125, 576–590. <http://dx.doi.org/10.1037/0033-2909.125.5.576>.
- Hsee, C. K., & Zhang, J. (2010). General evaluability theory. *Perspectives on Psychological Science*, 5, 343–355. <http://dx.doi.org/10.1177/1745691610374586>.
- Lam, S. Y., Shankar, V., Erramilli, M. K., & Murthy, B. (2004). Customer value, satisfaction, loyalty, and switching costs: an illustration from a business-to-business service context. *Journal of the Academy of Marketing Science*, 32, 293–311. <http://dx.doi.org/10.1177/0092070304263330>.
- Leonardelli, G. J., Pickett, C. L., & Brewer, M. B. (2010). Optimal distinctiveness theory: A framework for social identity, social cognition, and intergroup relations. *Advances in Experimental Social Psychology*, 43, 63–113. [http://dx.doi.org/10.1016/S0065-2601\(10\)43002-6](http://dx.doi.org/10.1016/S0065-2601(10)43002-6).
- Loewenstein, G. F., Thompson, L., & Bazerman, M. H. (1989). Social utility and decision making in interpersonal contexts. *Journal of Personality and Social Psychology*, 57, 426–441. <http://dx.doi.org/10.1037/0022-3514.57.3.426>.
- McCullough, M. A., Berry, L. L., & Yadav, M. S. (2001). An empirical investigation of customer satisfaction after service failure and recovery. *Journal of Service Research*, 3, 121–137. <http://dx.doi.org/10.1177/109467050032002>.
- Nieder, A., & Miller, E.K. (2003). Coding of cognitive magnitude: Compressed scaling of numerical information in the primate prefrontal cortex. *Neuron*, 37, 149–157. [http://dx.doi.org/10.1016/S0896-6273\(02\)01144-3](http://dx.doi.org/10.1016/S0896-6273(02)01144-3).
- Noone, B. M., & Lee, C. H. (2011). Hotel overbooking: The effect of overcompensation on customers' reaction to denied service. *Journal of Hospitality &*

- Tourism Research*, 35, 334–357. <http://dx.doi.org/10.1177/1096348010382238>.
- Olsen, L. L., & Johnson, M. D. (2003). Service equity, satisfaction, and loyalty: From transaction-specific to cumulative evaluations. *Journal of Service Research*, 5, 184–195. <http://dx.doi.org/10.1177/1094670502238914>.
- Paolacci, G., & Chandler, J. (2014). Inside the Turk: Understanding Mechanical Turk as a participant pool. *Current Directions in Psychological Science*, 23, 184–188. <http://dx.doi.org/10.1177/0963721414531598>.
- Rittenberg, L. & Tregarthen, T. (2012). *Principles of Microeconomics* (Version 2.0). Washington, DC: Flat World Knowledge, Inc.
- Simonsohn, U. (2016). Two-lines: The first valid test of u-shaped relationships. http://urisohn.com/papers/u_shape.pdf.
- Sinclair C. D. (1982). GLIM for Preference. In R. Gilchrist (ed.), *Proceedings of the International Conference on Generalised Linear Models* (pp. 164–178). New York: Springer-Verlag.
- Smith, A. K., Bolton, R. N., & Wagner, J. (1999). A model of customer satisfaction with service encounters involving failure and recovery. *Journal of Marketing Research*, 36, 356–372. <http://dx.doi.org/10.2307/3152082>.
- Thurstone, L. L. (1927). A law of comparative judgment. *Psychological Review*, 34, 273–286. <http://dx.doi.org/10.1037/h0070288>.
- Tullberg, J. (2006). Excesses of responsibility? – reconsidering company liability. *Journal of Business Ethics*, 64, 69–81. <http://dx.doi.org/10.1007/s10551-005-5906-2>.
- Webster, C., & Sundaram, D. S. (1998). Service consumption criticality in failure recovery. *Journal of Business Research*, 41, 153–159. [http://dx.doi.org/10.1016/S0148-2963\(97\)00004-0](http://dx.doi.org/10.1016/S0148-2963(97)00004-0).