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Article

Behavioral Return Interventions - How Behavioral Science Helps Prevent Returns in E-Commerce

Marketing Review St.Gallen

Provided in Cooperation with:

Universität St. Gallen, Institut für Marketing und Customer Insight

Suggested Citation: Pfrang, Thilo; Spreer, Philipp (2022) : Behavioral Return Interventions - How Behavioral Science Helps Prevent Returns in E-Commerce, Marketing Review St.Gallen, ISSN 1865-7516, Thexis Verlag, St.Gallen, Vol. 39, Iss. 4, pp. 24-33

This Version is available at:

<https://hdl.handle.net/10419/276196>

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Marketing Review St.Gallen

«Cognitive Biases» im Marketing



Schwerpunkt

Customer Centricity durch Biases –
Ein Interview mit Monica Dreyer &
Matthias Fuchs

Elaboration Likelihood
im E-Mail-Marketing

Cognitive Biases as Boosters –
Using Cognitive Biases to Improve
Communication Recall for
Emmi Jogurtpur

Behavioral Return Interventions –
How Behavioral Science Helps
Prevent Returns in E-Commerce

Cognitive Biases in Free-to-play Games

Spektrum

Nachhaltigkeit vermitteln
und verkaufen – Schritte zu einer
grünen Customer Journey

Gamifying B2B Sales –
An Analysis of the Status Quo and
Potential for Gamification within Sales

The Art of Social-Media-Influence –
Was es für eine erfolgreiche Kampagne
zu berücksichtigen gilt und welche
Fauxpas man besser vermeiden sollte



Behavioral Return Interventions

How Behavioral Science Helps
Prevent Returns in E-Commerce

From the customer, company, and sustainability perspectives, it is agreed that e-commerce returns should be avoided. However, practical approaches to preventing returns are lacking. A large-scale experiment in four European countries now shows that behavioral design interventions (“nudging”) can prevent millions of returns.

Dr. Thilo Pfrang, Dr. Philipp Spreer

Three hundred fifteen million parcels are unnecessarily shipped through Germany (which will serve as an example here) as returns every year; on a European level (dpa, 2021), this figure is beyond one billion. This has a massive impact:

- With an average of 1.17 kg CO₂ emissions per parcel, the ecological damage from returns adds up to 370 000 t CO₂ (calculated with data from Retourenforschung, 2019).
- E-commerce companies pay an average of €19.51 for a return parcel, including all ancillary return costs (Retourenforschung, 2019). Extrapolated to the German returns volume, this results in costs of €6.15 billion. Even assuming that the effective cost per return is lower because more than one item is returned in a package, this figure remains in the mid-single digit billions.
- In a previous unpublished study, the authors conducted a survey among >10 000 online shoppers and discovered that, on average, it takes customers 32 minutes to process a return. With an average hourly wage of €18.63 in Germany, this corresponds to invisible costs of almost €10 that customers pay for a return.

Moreover, the COVID-19 pandemic and the associated surge in e-commerce growth significantly increased the need for action to reduce returns. Lowering the return rate holds the potential to make e-commerce more sustainable, more effective, and less expensive for customers. This is particularly true for one specific sector: while the return rate across categories is 16.3% (Heinemann & Mulyk, 2020), this figure is above 40% in the fashion industry (Rösch, 2021). When trying to exert the greatest possible influence on the level of returns, it makes sense to focus on product categories that have a combination of a high market share, a high parcel volume, and a high return rate. For this reason, the focus of this study is on the “Fashion & Accessories” category – while still attempting to identify universally applicable measures to reduce returns.

Although returns have been in the focus of online retailers for a long time and are a true hassle for customers, the return rate remains at a high level. This can be explained by the intention–action gap, also known as the “green gap” in the context of sustainability (Gleim & Lawson, 2014). In brief: We often do not act according to our intentions. As customers we generally want to avoid returns, but in the moment of decision, doubts can dominate (Maity, 2012). This results in our concrete actions not being in line with our intentions. So the big question is: How can the return rate be reduced without resorting to restrictive or punitive measures?

To make one thing clear: There will always be returns. They are not bad per se but an integral part of a retailer’s service promise.



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Situations, however, in which articles are returned unnecessarily – for example, because there was a lack of information or uncertainty at the moment of decision – are of particular interest. Consequently, the focus (from both research and the present study) is on the avoidance of returns before the order is placed. Interventions at this point can reduce the negative impact of returns to zero.

Current State of Research

So far, the research on returns has hardly investigated ways to change the customer’s return behavior from the retailer’s point of view. Previous research has focused on analyzing the drivers and consequences of returns (Minnema et al., 2018), in particular the influence of the return behavior on future purchasing behaviors and the extent to which this can be used to calculate an optimal return rate that generates the greatest possible profit for the retailer (Petersen & Kumar, 2009). Furthermore, studies have examined various factors influencing returns such as customer reviews (Sahoo et al., 2018), product presentation (De et al., 2013), the influence of various marketing tools such as coupons, newsletters, catalogs, free shipping, paid searches, and ads (El Kihal & Shehu, 2022). Other studies have focused on the influence of personal motives on return behavior such as fraudulent inclinations (Harris, 2008), opportunism (Powers & Jack, 2013; Pfrang et al., 2015), and cognitive dissonance (Maity, 2012), or they have analyzed how the amount and nature of cognitive responses generated during the choice process affects consumers’ post-

purchase behavior (Bechwati & Siegal, 2005). On the other hand, the majority of previous studies in the context of returns has examined the effect of lenient (versus strict) return policies on profitability (Bower & Maxham III, 2012; Janakiraman & Ordóñez, 2012) and has incorporated variables such as risk reduction through positive return experiences (Petersen & Kumar, 2015), quality signaling (Bonifield et al., 2010), or trust (Oghazi et al., 2018). And last but not least, practice-oriented studies have examined the development of returns in Europe, focusing on countries with particularly high return rates, such as Germany or Switzerland (Kaufmann, 2022; Retourenforschung, 2020).

In summary, previous research has focused on motives and influencing factors of returns, as well as the ideal design of marketing instruments and return conditions in terms of an economically optimal relationship between sales and returns. However, the question of how psychological interventions can directly influence and change return behavior represents a gap in our current knowledge (Pfrang et al., 2015). This gap will be addressed in the present study.

Practical Approaches to Reducing Return Rates

The existing research gap is not particularly surprising because, even in practice, there has been little work on operationalizing psychological and behavioral science mechanisms (Spreer et al., 2022). Fundamentally, return-reducing

Management Summary

E-Commerce returns are an example of a perfect “alignment of interests”: From the customer, company, and sustainability perspectives, it is clearly agreed that they should be avoided. But effective approaches to preventing returns are lacking, the return rate remains stable at a high level. A large-scale experiment in four European countries now shows that behavioral design interventions (“nudging”) can help to close the so-called “green gap” between people’s good intentions and effective impact. It proves that the right interventions at the right moment are able to effectively prevent millions of returns – without a negative impact on sales.

approaches can be divided into two categories: supportive and restrictive measures. Almost all online retailers work with supportive measures, first and foremost the optimization of product information (e.g., size advisors, virtual try-on, customer reviews, showing products in the context of use). Qualitative (e.g., status upgrade in the customer loyalty program) or financial incentives (e.g., discount on follow-up orders) are used much less frequently. However, restrictive measures are also part of the standard repertoire, especially deliberately complicating the returning process (e.g., by not enclosing a return slip). Hard restrictive measures are rarely used, such

Table 1: Overview of the Behavioral Psychological Mechanisms Considered in the Studies

Behavioral Psychological Mechanism	Explanation	Literature
Social norms	People follow others, especially in ambiguous situations, believing that others know better and behave most effectively in a given situation.	Cialdini et al., 1991 Goldstein et al., 2008
Reciprocity	Human motivation to return a favor: People feel obliged to give back to others some behavior, gift, or service that they have received.	Goldstein et al., 2011
Loss aversion	Losses are perceived more negatively than gains positively.	Kahneman & Tversky, 1979
Commitment and consistency	Human tendency to balance feelings and attitudes: Commitments lead to consistent behavior	Baca-Motes et al., 2013
Awareness of own advantages and controllability: self-benefit, illusion of control	Social behavior is influenced by individual cost-benefit analyses as well as the tendency of people to believe they have more control over things than they actually do.	Blau, 1964 Langer, 1975

Source: Own illustration.

Table 2: Overview of the Behavioral Interventions Used in the Studies

Intervention	Description	Literature	Number of Visits and Orders													
			Study 1 (NL)		Study 1 (DE)		Study 2 (DE)		Study 3 (CH)		Study 4 (BE)		Study 5 (DE)		Study 6 (DE)	
Standard environmental message	States that using existing info and size advice can help avoid returns and protect the environment.	Goldstein et al., 2008	2961	1444	5310	2565			897	529	938	505	1776	1078		
Social norm	States that many other customers already behave sustainably by avoiding returns.	Goldstein et al., 2008	3273	1568			2149	803	892	549	920	495				
Social norm (reference group)	Relates others' sustainable behavior to a reference group (other customers who were also unsure of the size).	Goldstein et al., 2008					2115	798								
Social norm (deviation)	Describes the consequences of deviating from the communicated norm.	Blanton et al., 2001					2060	775								
Social norm (implementation)	Enables the implementation of the normative behavior by linking the size advice to the phone number of the customer service.	Goldstein et al., 2008					1921	705								
Self-benefit	Describes the benefits of the sustainable behavior for the customers themselves.	White & Simpson, 2013					2093	826								
Reciprocity	Communicates the online store's providing product info and size advice as a favor to motivate cooperative behavior in return.	Goldstein et al., 2011	3205	1547	5429	2634	2103	718	818	511	984	520				
Loss aversion	Describes the effort and loss of time caused by imprudent ordering.	Kahneman & Tversky, 1979	3240	1536			2047	769	1001	582	921	471				
Illusion of control	Gives a sense of control and a feeling of independence.	Langer, 1975	3268	1606					874	514	906	500	1903	1151		
Loss aversion (survey)	Survey asking how long it usually takes the customer to return a product.	Thaler, 1985													25 542	25 542
Commitment (survey)	Survey asking for the customer's willingness to support the retailer in preventing product returns on a scale from 1 to 7.	Baca-Motes et al., 2013													25 473	25 473
Control	No message		888	431	5066	2594	4072	1537	352	202	393	204	723	445	2974	2974
			16 835	8 132	15 805	7 793	18 560	6 931	4 834	2 887	5 062	2 695	4 402	2 674	53 989	53 989

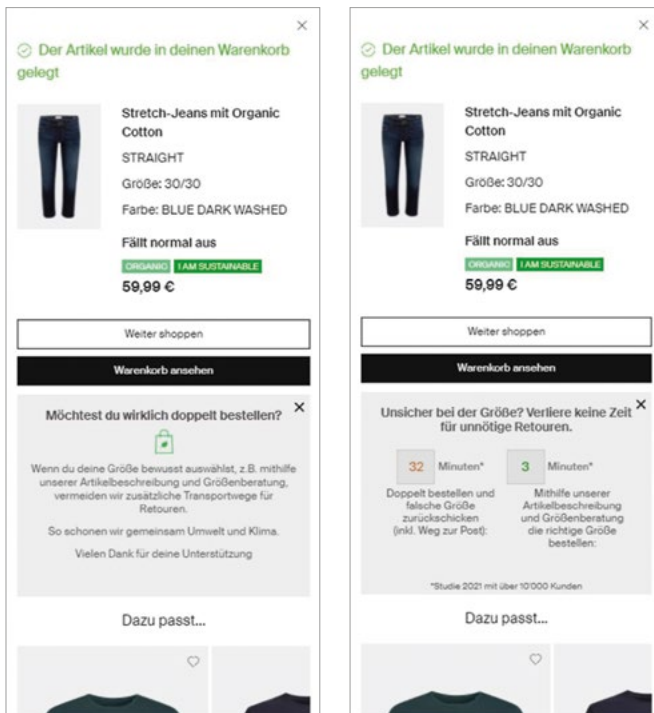
Source: Own illustration.

Table 3: Results of the Studies

	Conversion Rate			Return Rate			Net Revenue per Visit (EUR)		
	Intervention	Control	Δ%	Intervention	Control	Δ%	Intervention	Control	Δ%
Study 1 (NL, DE)									
Standard environmental message	48.77%	48.55%	0.45%	60.20%	60.01%	0.32%	29.86	31.98	-6.63% *
Social norm	47.91%	48.55%	-1.32%	57.87%	60.01%	-3.57%	32.97	31.98	3.10% *
Reciprocity	48.27%	48.55%	-0.58%	60.79%	60.01%	1.30%	32.16	31.98	0.56%
Loss aversion	47.41%	48.55%	-2.35%	57.09%	60.01%	-4.87%	32.6	31.98	1.94% *
Illusion of control	49.14%	48.55%	1.22%	59.45%	60.01%	-0.93%	33.37	31.98	4.35% *
Standard environmental message (DE)	48.31%	51.21%	-5.66%	50.53%	51.20%	-1.31%	178.42	183.41	-2.72% *
Reciprocity (DE)	48.52%	51.21%	-5.25%	49.82%	51.20%	-2.70%	183.64	183.41	0.13% *
Study 2 (DE)									
Social norm	37.37%	37.75%	-1.01%	69.11%	71.27%	-3.03%	20.46	20.59	-0.63%
Social norm (reference)	37.73%	37.75%	-0.05%	70.23%	71.27%	-1.46%	20.11	20.59	-2.33%
Self-benefit	39.46%	37.75%	4.53%	68.70%	71.27%	-3.61%	22.48	20.59	9.18%
Loss aversion	37.57%	37.75%	-0.48%	68.30%	71.27%	-4.17%	21.01	20.59	2.04%
Social norm (deviation)	37.62%	37.75%	-0.34%	67.90%	71.27%	-4.73%	20.85	20.59	1.26%
Social norm (implementation)	36.70%	37.75%	-2.78%	69.70%	71.27%	-2.20%	21.03	20.59	2.14%
Reciprocity	34.14%	37.75%	-9.56%	68.78%	71.27%	-3.49%	18.87	20.59	-8.35%
Study 3 (CH)									
Standard environmental message	58.97%	57.40%	2.74%	64.79%	63.55%	1.95%	70.49	63	11.89%
Social norm	60.54%	57.40%	5.47%	61.08%	63.55%	-3.89%	76.98	63	22.19%
Reciprocity	62.47%	57.40%	8.83%	63.78%	63.55%	0.36%	72.63	63	15.29%
Loss aversion	58.14%	57.40%	1.29%	49.12%	63.55%	-22.71%	102.74	63	63.08%
Illusion of control	58.81%	57.40%	2.46%	61.88%	63.55%	-2.63%	70.02	63	11.14%
Study 4 (BE)									
Standard environmental message	53.84%	52.09%	3.36%	59.40%	58.11%	2.22%	44.64	50.37	-11.38% *
Social norm	53.80%	52.09%	3.28%	61.90%	58.11%	6.52%	41.14	50.37	-18.32% *
Reciprocity	52.85%	52.09%	1.46%	58.68%	58.11%	0.98%	46.27	50.37	-8.14% *
Loss aversion	51.14%	52.09%	-1.82%	56.20%	58.11%	-3.29%	43.74	50.37	-13.16%
Illusion of control	55.19%	52.09%	5.95%	55.62%	58.11%	-4.28%	52.65	48.97	7.51% *
Study 5 (DE)									
Standard environmental message	60.70%	61.51%	-1.32%	51.59%	51.25%	0.66%	120.44	123.89	-2.78% *
Illusion of control	60.48%	61.51%	-1.67%	50.22%	51.25%	-2.01%	127.43	123.89	2.86% *
Study 6 (DE)									
Loss aversion	Conversion rate cannot be measured because interventions were implemented after the order was placed (order confirmation).			31.45%	32.25%	-2.48%	163.97	163.95	0.01% *
Commitment				31.31%	32.25%	-2.91%	165.43	163.95	0.90% *
						-3.92%			8.69%

* p < .05 (statistically significant). Source: Own illustration.

Figure 1: Standard Message and Loss Aversion Message (Example)



Source: Own illustration.

as functional restrictions (e.g., payment in advance only) or the exclusion of frequent returners.

Quite obviously, these well-known and widespread measures are not sufficiently effective in reducing the return problem – as evidenced by the consistently high return rates in almost all European countries (Whittaker-Wood, 2019). With this in mind, it seems plausible to test approaches that have already proven highly effective in other use cases. This applies, for example, to behavioral design in the context of increasing sales or customer loyalty. More specifically, this includes measures based on customers' intuitive decision-making mechanisms that can effectively drive behavior without requiring monetary incentives or restrictions. Especially in the context of returns, it is essential not to be manipulative but to support customers in acting according to their intentions (i.e., to close the "green gap"). From a practical point of view, a successful transfer of these approaches would be highly relevant because it would obviate the need for potentially reputation-damaging measures and present an alternative to the much-discussed mandatory return fee.

Methodology and Operationalization

To contribute to answering this question, a large field study was designed involving almost 120,000 customers in real shopping activities in four European countries. It consisted of six field experiments (hereinafter referred to as studies), each involving a different online store in the fashion sector. All individual studies followed a randomized between-subjects design and consisted of a control group and multiple experimental groups (one for each behavioral psychological mechanism used) to which participants were randomly assigned. With this method, causal statements about the relationship between the behavioral interventions and the return rate (but also the net revenue and the conversion rate) are possible as additional influencing factors are averaged out. In addition to the control group, a standard environmental message (whose formulation did not follow any behavioral psychological mechanism) also served as a basis for comparison. A technical solution was needed to allow the customers to respond situationally to the respective environmental contexts and to apply the appropriate interventions. For this purpose, the SaaS of behamics® was used. The intelligent targeting of behavioral interventions resulted in a set-up that generated numerous experimental results around the clock.

The behavioral psychological mechanisms used for the interventions were selected from the most cited theories and behavior change studies in behavioral science like the prospect theory with loss aversion (Kahneman & Tversky, 1979), the focus theory of normative conduct with social norms (Cialdini et al., 1991) or the social exchange theory (Blau, 1964) with self-benefit, reciprocity and illusion of control (see Table 1).

The interventions popped up either when a size selection order (i.e., an item is added to the shopping cart in multiple sizes)

Main Propositions

- 1 Behavioral interventions are highly effective in reducing e-commerce returns.
- 2 The effectiveness of the interventions depends on factors such as regional and cultural influences or customer segments.
- 3 Sustainability information without a foundation in behavioral science can be counterproductive and even increase the return rate.

Table 4: Overview of the Behavioral Interventions Used in the Studies

	Study 1 (NL)			Study 1 (DE)			Study 2 (DE)			
Intervention	CR	RR	NRV	CR	RR	NRV	CR	RR	NRV	
Standard environmental message	0.45%	0.32%	-6.63% *	-5.66% *	-1.31% *	-2.72% *				
Social norm	-1.32%	-3.57% *	3.10% *				-1.01%	-3.03% *	-0.63% *	
Social norm (reference group)							-0.05%	-1.46% *	-2.33% *	
Social norm (deviation)							-0.34%	-4.73% *	1.26% *	
Social norm (implementation)							-2.78%	-2.20% *	2.14% *	
Self-benefit							4.53% *	-3.61% *	9.18% *	
Reciprocity	-0.58%	1.30%	0.56%	-5.25% *	-2.70% *	0.13% *	-9.56% *	-3.49% *	-8.35% *	
Loss aversion	-2.35%	-4.87% *	1.94% *				-0.48%	-4.17% *	2.04% *	
Illusion of control	1.22%	-0.93%	4.35% *							
Loss aversion (survey)										
Commitment (survey)										

CR = Conversion Rate; RR = Return Rate; NRV = Net Revenue per Visit (EUR)

was detected (study 1 to 5) or in the form of a short customer feedback survey on the order confirmation page (study 6) (see Table 2).

The experiments were conducted in the online stores of multinational apparel companies in Germany (DE), Switzerland (CH), Belgium (BE), and the Netherlands (NL) and encompassed 119 487 online shop visitors with 85 092 orders in total. The samples included 32 640 online shop visitors with 15 925 orders in study 1, 18 560 store visitors with 6 931 orders in study 2, 4834 visitors with 2878 orders in study 3, 5062 visitors with 2695 orders in study 4, 4402 visitors with 2674 orders in study 5, and 53 989 customers and orders in study 6 (as the intervention here started after the order was placed).

The selection of the countries and the interventions used resulted from operational restrictions and the feasibility of using the companies' online stores for the experiments.

Figure 1 shows an example of one of the behavioral interventions. Below the black button ("Warenkorb ansehen"/"View shopping cart") on the left, it shows the default message for the

control group. On the right, a message using loss aversion for one of the experimental groups can be seen.

Results and Implications

The analyses of the results are based on ANOVA and post-hoc t-tests to test for significant mean differences between the intervention and control groups. As illustrated in Table 2, the results of all six studies show that the return rate can be significantly reduced by 4% on average through social norms, reciprocity, loss aversion, commitment and consistency messages and the awareness of one's own advantages and controllability (self-benefit, illusion of control) (see Table 1).

A noteworthy point for practitioners is that this significant reduction in returns is not always at the expense of sales but actually increases net sales significantly by 8% on average. The effects on the conversion rate vary. While in studies 1, 2, and 5, all behavioral interventions except for the illusion of control and self-benefit interventions lower the conversion rate, in studies 3 and 4, they lead to marginal uplifts with the exception of the loss

	Study 3 (CH)			Study 4 (BE)			Study 5 (DE)			Study 6 (DE)		
	CR	RR	NRV	CR	RR	NRV	CR	RR	NRV	CR	RR	NRV
	2.74%	1.95% *	11.89% *	3.36%	2.22%	-11.38% *	-1.32%	0.66%	-2.78%			
	5.47% *	-3.89% *	22.19% *	3.28%	6.52%	-18.32% *						
	8.83% *	0.36%	15.29% *	1.46%	0.98%	-8.14% *						
	1.29%	-22.71% *	63.08% *	-1.82%	-3.29%	-13.16%						
	2.46%	-2.63% *	11.14% *	5.95% *	-4.28%	7.51% *	-1.67%	-2.01% *	2.86% *			
							Conversion Rate cannot be measured for Study 6 because interventions were shown after the order was placed (order confirmation).				-2.48% *	0.01% *
											-2.91% *	0.90% *

* p< .05 (statistically significant). Source: Own illustration.

aversion intervention. Individual interventions such as social norms, reciprocity, and illusion of control messages actually increase the conversion rate significantly by 7% on average.

In studies 1, 2, and 5, customers seem to order more deliberately as a result of the interventions, so the conversion rate suffers. However, most interventions achieve a significant increase in net sales because customers are motivated by the interventions to avoid orders that would subsequently be returned.

Remarkably, compared to the control group, the standard environmental message actually increases the return rate by up to 2.2% in all four studies in which it was assessed and significantly decreases net sales by up to 11.4%. Profane environmental appeals can thus have a counterproductive effect. Instead of communicating an environmental appeal without taking behavioral psychology into account, it would be better to do nothing.

At the same time, this underlines the effectiveness of behavioral interventions. The mechanisms with the most apparent effects are explained in more detail below (also see Table 3 and Table 4).

Reciprocity

A reduction in returns through cooperative behavior based on reciprocity was achieved, for example, with DE customers (-3.5%) but not with NL or BE customers (cf. studies 1, 2, and 4) who did not value the company's communicated effort at helping to find the right size. In CH, reciprocity also failed to reduce returns (+0.4%) but increased net sales (+15.3%). The reasons for this phenomenon might be the different levels of customers' appreciation (and therefore feelings of obligation) of companies' services and efforts to help them find the right product across countries.

Therefore, it is important to investigate which type of service is important for the respective customer segment and to use reciprocity interventions suitably to achieve a behavior change.

Social Norms

Even a highly individual decision such as returning goods is significantly influenced by other people's behavior (stu-

dies 1 and 2). An intervention using social norms lowers the return rate by more than 3.0% in studies 1–3. While it significantly increases net sales by 3.1% and 22.2% in CH and NL, respectively, it marginally decreases sales in DE. In contrast, a communication using social norms significantly increases the return rate in BE and lowers net sales by 18.3%. In BE, describing what others do seems to promote reactance rather than cooperative behavior. This may be explained by a stronger expression of individualism (Hofstede, 2001) and, therefore, a lower tendency towards conformity with social norms. The

«Myth disproved: A significant reduction in returns is not necessarily at the expense of sales.»

potential for behavior change also depends on the type of norm communicated. For example, study 2 shows that undesirable behavioral effects (i.e., a decline in sales) occur when the social norm communicated refers to reference groups that are not relevant to the addressee. Conversely, significant reductions in returns (and increases in sales) occur when shoppers are made aware of a personal deviation from the norm and/or the implementation of norm-compliant behavior is facilitated, e.g., through direct access to customer service or assistance for finding the right size.

Loss Aversion

The human tendency to avoid losses is also evident in the present studies. The loss framings significantly reduced returns by 7.5% on average in all studies. Moreover, net sales increased by 10.8% on average. Only in BE did loss aversion not significantly affect net sales. Furthermore, the study with interventions after the actual purchase (study 6) indicates that loss aversion (as well as commitment and consistency) does not solely produce short-term behavioral change but also has a long-term impact, e.g., on follow-up orders.

Illusion of Control

Significant behavioral changes were also achieved by the illusion of control intervention in studies 1, 3, 4, and 5, with significant return reductions of 2.5% and net sales increases of 5.1% on average. Except for study 5, it also increased the conversion rate by 2.0% on average. Even in study 1, in which all other interventions lowered the conversion rate due to the activation of a more deliberate buying behavior,

the intervention illusion of control led to a slightly increased conversion rate (by 1.2%).

Conclusion and Outlook

The present study shows that the return rate can be significantly reduced by behavioral interventions. Moreover – contrary to widespread assumptions – sales can simultaneously be increased. Communication based on behavioral psychology achieves the desired changes in behavior without the need for monetary or restrictive measures.

At the same time, these mechanisms depend on additional factors, such as the individual perception of the relevance of the communicated feature (e.g., a sizing guide), the reference group, the degree of perceived norm deviation, or the possibilities for the direct implementation of a particular behavior. Last but not least, the differences between countries also point to cultural factors. Important: If customers' decision-making principles are not adequately understood, sustainability messages can also increase the return rate.

Retailers are therefore advised to make use of behavioral insights to render their communication more persuasive and thus achieve significant behavioral changes in terms of sustainability. However, this will only succeed if the use of psychological mechanisms is differentiated and follows a dynamic data-driven approach. Statically implementing winner variants from A/B testing involves the risk of a variable or even counterproductive impact of the behavioral interventions as changing circumstances and individual


Lessons Learned

- 1 An in-depth analysis of the reasons for returns provides information about particularly effective behavior mechanisms.
- 2 Companies should experiment with behavioral design for greater sustainability but not limit themselves to it to maximize their impact.
- 3 Investigating the potential of transferring the results to other use cases of sustainability in the digital context is recommended.
- 4 Dynamic (not static) approaches harness the full potential of behavioral design.

predispositions cannot be accounted for (in contrast to AI-based systems).

The achieved effect of a return rate that is approximately 4% lower may sound small. Yet, on a European scale (extrapolated from data for Germany; Spreer et al., 2022) it represents a potential avoidance of more than 140 million return packages or around 115 000 t CO₂. Additionally, based on an assessment of the further training potential of the AI

model, an 8% reduction in returns seems realistic considering the substantial reductions that could be measured in the presented studies.

Behavioral interventions related to sustainability can also be applied in other use cases. The transfer to preference formation for sustainable products, energy saving, mobility, and generally more conscious consumption can be implemented based on the presented insights. 

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