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Level Up or Game Over in Online Return Management? A Challenge-Based Gamification Approach for Online Fashion Retail

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Abstract

Based on self-determination theory, we analyze if and how challenge-based gamification influences customers' online shopping behavior in a way that reduces returns. We use structural equation modeling to examine our data from a survey-based online experiment with US online shoppers (n=1010). We show that our gamification approach directly affects return and purchase motivation. In addition, indirect effects are observed through a change in autonomy, competence and relatedness need satisfaction. Furthermore, we conducted regression and moderation analyses with demographic characteristics and the hexad gamification user types scale.

Keywords: Challenge-based gamification, hexad scale user types, return behavior.

1. Introduction

In fashion retail, consumers like to feel the clothes before they buy them. This is a problem in e-commerce because consumers cannot try on clothes before buying them from the online shop. Online fashion retailers solve this problem by offering generous return policies (e.g., free returns, long return windows, and full refunds) that allow customers to use their home as a fitting room. In addition, lenient return policies reduce perceived purchase risk, leading to a positive image and higher trust in the online fashion retailer, which increases sales and builds customer loyalty (Rokonuzzaman et al., 2021). However, these lenient return policies obviously also lead to more product returns, which is detrimental to the financial success of retailers. The average return rate for online apparel orders in the US is 24.4%, nearly 8 percentage points higher than the overall online return rate, which translates to \$38 billion in returns and an estimated \$25.1 billion in handling costs in 2023 (Coresight Research, 2023). Online returns add significant costs to an online fashion retailer's supply chain (Gustafsson et al., 2021). Also worth mentioning is the negative impact on the environment. Returns increase CO₂ emissions

and generate additional waste (Chaleshtari et al., 2022). The processing of returns results in a doubling of logistics emissions from road, sea, or air freight, as well as packaging and labelling waste (e.g., Tian & Sarkis, 2022; Robertson et al., 2020). In the US, product returns are estimated to generate 24 million tons of CO₂ and 9.5 billion pounds of landfill waste annually (Optoro, 2022). Particularly in online fashion retail, returns often cannot be resold and must be disposed of, even if they are in perfect condition, for image reasons or due to the fast-moving nature of fashion. Every returned product has a negative impact on both the environment and the online retailer's profitability.

A restrictive return policy (e.g., return fees or short return windows) is probably the easiest way to reduce the return rate. However, consumers may resent a strict return policy. In fact, after free shipping (96%), free returns (76%) is the second most important factor when shopping online (PowerReviews, 2021). As a result, many online retailers view high return rates as unavoidable, believing they need a generous return policy to increase their share of wallet (Wang et al., 2019). To resolve this tradeoff, returns must be managed in a way that reduces returns without compromising sales and customer loyalty. In this study, we analyze a challenge-based gamification approach that aims to motivate customers' shopping behavior in a way that reduces returns.

Gamification has been defined as the use of game elements in non-game contexts (Deterding et al., 2011) with the aim of creating game-like experiences (e.g., fun, satisfaction, motivation) and influencing behavior in a certain manner (Hamari et al., 2014; Huotari & Hamari, 2012; Krath et al., 2021). In online retail, gamification is used to increase brand engagement, to create an entertaining shopping experience, or to increase purchase intention (Gao & Wu, 2022). While gamification in online retail has been extensively studied for the purpose of promoting sales, there has been limited research on preventing unsustainable return behavior. Thus, our research question (RQ) is:

RQ: *Does challenge-based gamification affect consumers' return motivation in online fashion retail?*

To analyze the effects of our challenge-based gamification approach on customer return behavior, we use the psychology of human motivation, in particular the well-established self-determination theory (SDT) developed by Deci & Ryan (1985). SDT focuses on human motivation and considers the factors that drive behavior. The central idea of SDT is to focus on the type rather than the amount of motivation, which encompasses a continuum from intrinsic to extrinsic motivation (Ryan & Deci, 2000b). Thus, our analysis focuses not only on whether, but more importantly, on how our approach affects return motivation.

In the following, we examine a challenge-based gamification approach in the context of fashion online retail and develop our hypotheses (H) based on SDT. We then present a survey-based online experiment with US online shoppers (n=1010) and the results of our structural equation modeling (SEM). We conclude with a discussion, limitations, practical and theoretical implications, and an outlook for future research.

2. Gamification in online retail

In the context of online retail, Lounis et al. (2013, p. 201) define gamification as “... the process of game-thinking and game-mechanics to engage the consumer in the nongaming context of shopping in order to drive engagement and enhance the process of behavioral shift.” Gamification is often integrated into software applications, apps, or websites. Behl et al. (2020) and Tobon et al. (2020) show in their literature reviews that gamification is an emerging concept in online retail that can increase customer loyalty, motivation, engagement, and fun. Recent studies have also shown positive effects of gamification on online shoppers’ behavior and attitudes. (e.g., Azmi et al., 2021; Rahmadhan et al., 2023). International fashion brands, such as Nike and Gucci, are using gamification to improve the shopping experience for their customers. For example, the Nike app taps into the innate human desire for achievement and progress by incorporating challenges. Completing these challenges unlocks exclusive rewards. Moreover, Gucci offers a variety of mini-games and challenges that allow customers to explore Gucci’s heritage and product range. Gamification is often used in loyalty programs. Animated games (e.g., bingo, Monopoly, or wheels of fortune) help to make app-based loyalty programs more enjoyable and interesting (Hwang & Choi, 2020).

Frequently used gamification elements are points, badges, and leaderboards, which are referred to as the PBL triad (Tandon & Ertz, 2024). Gamification designs that are based on these elements are also known as challenge-based gamification (Legaki et al., 2020; Xi & Hamari, 2019). PBL are considered closely related and can be used together to optimize the efficiency of

gamified online retail and increase sales (Azmi et al., 2021). However, such an increase in sales is regularly accompanied by a corresponding rise in returns.

Returns in online fashion retail have a variety of reasons, including dissatisfaction with the size, style or even color (Ambilkar et al., 2022). Therefore, many measures taken by online fashion retailers focus on reducing returns due to customer dissatisfaction, e.g., reviews or size guides. Nevertheless, it must be taken into account that lenient return policies also foster unsustainable shopping behavior. The use of gamification to promote sustainable return behavior, however, has received limited research attention. Based on consumer interviews, Lopes et al. (2023) suggest that gamification can correct undesirable consumer behavior, such as returns. In a recent paper, Rauh et al. (2024) examined a customer-centric approach of gamification to prevent product returns in e-commerce. The authors conclude that their gamification scenario has a direct (negative) effect on return motivation and in particular acts as an extrinsic motivator. However, this result needs to be critically examined. The proposed gamification approach by Rauh et al. (2024) is combined with digital green nudging. In their gamification approach, customers are made aware that “returns cause high costs and harm the environment” (nudge). Also, their approach includes green framing (e.g. plant and tree symbols). This begs the question whether the results achieved are more due to gamification or nudging. Moreover, Rauh et al. (2024) do not consider gamification user types in their analysis. Such personal characteristics (in addition to other socio-demographic characteristics) may affect consumer behavior (Tobon et al., 2020). We address this research gap by (1) presenting a challenge-based gamification approach that is free of most psychological or moral pressure (e.g., due to a nudge) and by (2) including gamification user types in our analysis.

3. Gamification user types

It has been shown that individuals perceive and respond to gamified applications in different ways, and therefore the effects of gamification may vary among users (e.g., Hamari et al., 2014). In addition, several studies have shown that individuals perceive game elements differently (e.g., Barata et al., 2017; Tondello et al., 2017). As a result, numerous studies have examined how gamification affects different groups of individuals, with a focus on player/user types (Busch et al., 2016; Hamari & Tuunanen, 2014). The resulting gamification user type models aim to capture the differences between the behavior and attitudes of individuals in relation to game elements and game applications (Busch et al., 2016).

Based on the self-reported game preferences of Multi-User Dungeon (MUD) players, Bartle (1996) presented one of the first player type models, proposing a classification of four player types: Achiever, Explorer, Socializer, and Killer. This categorization of player types has been extended and adapted numerous times. Marczewski (2015) developed the gamification user types (UT) hexad scale to evaluate individual's preferences for game elements specifically in gamified applications. Hexad user types have different preferences for certain game elements. According to Tondello et al. (2016, 2017) and Orji et al. (2018), the user types prefer the following elements:

- (1) Socializers: Prefer social interactions, e.g., teams, guilds and friend lists.
- (2) Free Spirits: Like autonomy and discovery, e.g., open worlds, exploration, and creative building.
- (3) Achievers: Are motivated by challenges and goals, e.g., leaderboards, badges, and missions.
- (4) Philanthropists: Value meaning and purpose, e.g., community goals, mentoring roles, and helpfulness.
- (5) Players: Respond well to rewards and incentives, e.g., points, levels, and virtual currencies.
- (6) Disruptors: Seek innovation and change, e.g., ways to change the system or create challenges for others.

In difference to the previous player type models, players' intrinsic and extrinsic motivation are considered (Kim, 2015). Based on the SDT, four hexad user types are motivated intrinsically: (1) Socializers, (2) Free Spirits, (3) Achievers, and (4) Philanthropists. (5) Players, in contrast, are motivated by extrinsic rewards, and (6) Disruptors are not a user type derived from SDT (Kim, 2015; Santos et al., 2021). These insights could help make gamification elements more effective by addressing the users' specific motivations and preferences. For example, it seems obvious that for Players, offering rewards, such as prizes or gift vouchers, are suitable to increase user participation and engagement. For example, the Nike app (mentioned in Section 2) is likely to appeal to Achievers in particular.

4. Theoretical foundation and research model

Understanding why individuals behave in certain ways (e.g., returning a product purchased online) is critical to effectively influence behavior. Our work is grounded in the well-known self-determination theory of Deci & Ryan (1985). SDT addresses a continuum of different types of motivation, ranging from intrinsic to extrinsic motivation (Ryan & Deci, 2000b). Activities that draw on intrinsic motivation and self-driven behavior are those that a person finds interesting and that are performed solely because of the sheer pleasure of the activity. SDT posits that individuals are more

intrinsically motivated to engage in a certain behavior when the three basic psychological needs are satisfied (Ryan & Deci, 2000b): (A) the need for autonomy (e.g., perceived decision freedom), (C) the need for competence (e.g., feedback on behavior), and (R) the need for relatedness (e.g., a sense of belonging). The impact of motivational stimuli varies depending on individual and contextual factors. Autonomy and competence, for example, can be undermined by contextual conditions such as imposed goals (Ryan & Deci, 2000b). Gamification changes the context of decision-making (e.g., online shopping) by integrating specific game elements that in turn trigger motivational mechanisms (Alsawaier, 2018). Therefore, the implementation of game elements potentially affects the three basic psychological needs.

Extrinsic motivation comes into play whenever an activity is performed with the goal of achieving a definable result (e.g., badges) and thus contrasts with intrinsic motivation. Extrinsic motivation is linked to controlled motivation, as it connects activities to external values like rewards (Deci & Ryan, 1985).

The impact of a stimuli (e.g., game elements) on individuals' motivation depends on their perceptions of these stimuli (Ryan & Deci, 2000b, 2000a). Individuals who perceive these stimuli (e.g., rewards or points) as informational rather than controlling experience greater competence need satisfaction. In contrast, individuals who perceive rewards as pressure feel less autonomy. Therefore, game elements can have different effects on motivation: they can increase intrinsic motivation or decrease intrinsic motivation if they are perceived as controlling (Mekler et al., 2017).

Note, that in our survey, respondents indicated their perceived autonomy, competence, and relatedness when using a fictitious online shop Fashionstore.com. Using an online shop involves buying and possibly returning goods if you don't like them. Therefore, according to SDT, we assume in our study that the satisfaction of the three basic psychological needs A/C/R positively correlates with purchase and return motivation (PM and RM). It is important to recognize that perceived A/C/R need satisfaction when using an online shop could decrease due to gamification, whereas at the same time the game itself is perceived as enjoyable. While the game itself may (or may not) be enjoyable, the obvious agenda behind the gamification approach could, for example, decrease perceived autonomy when using the online shop. Below we derive our hypotheses, which are summarized in our conceptual model (see Figure 1).

When a person performs activities out of self-interest or personal value (e.g., placing an order with an online retailer), the level of perceived autonomy is high, i.e., the person is more likely to be intrinsically motivated, which facilitates the experience of interest,

enjoyment, and engagement in the tasks (Fu et al., 2018). When online shopping is combined with a gamification approach that judges an individual's return behavior, this can have an impact on the individual's perceived autonomy. Our challenge-based gamification approach aims to reduce returns through points, badges, and rewards. Rewards in particular can be perceived as controlling, thus reducing autonomy (Gao, 2024; Deci & Ryan, 1985, Kim & Anh, 2017):

H1: *Our gamification approach decreases A need satisfaction (H1a) and thereby decreases RM and PM (H1a mediated through H1b).*

Perceived competence is a person's self-perception of their abilities and their ability to control their environment and situation. It indicates how skillful and effective a person considers themselves to be in a particular situation (Sailer et al., 2017). In our case, the rules associated with playing the "Return Game" increase the complexity of using the online shop which may lead to a reduction in competence need satisfaction:

H2: *Our gamification approach decreases C need satisfaction (H2a) and thereby decreases RM and PM (H2a mediated through H2b).*

The need for social relatedness refers to the need to feel connected and have a sense of belonging to others (Kim & Drumwright, 2016). Our challenge-based gamification approach focuses on achievement and competition among online shoppers (leaderboards), rather than collaboration among online shoppers. Previous research has shown that purely competitive gamification is suboptimal for creating an enjoyable environment (Morschheuser et al., 2019). Our gamification approach focuses less on social relatedness and more on competitive relatedness; thus:

H3: *Our gamification approach decreases R need satisfaction (H3a) and thereby decreases RM and PM (H3a mediated through H3b).*

Challenge-based gamification is a goal-oriented system in which elements such as points, badges, and rewards are used to incentivize certain behaviors. As a result, our gamification approach probably acts at least in part as an extrinsic motivator that directly decreases return motivation (RM). Accordingly, we hypothesize:

H4: *Our gamification approach directly decreases return motivation.*

Game success in our gamification approach depends indirectly on the quantity purchased (i.e., the more is purchased and not returned, the higher the reward). We therefore expect an overall increase in the purchase motivation (PM):

H5: *Our gamification approach directly increases purchase motivation.*

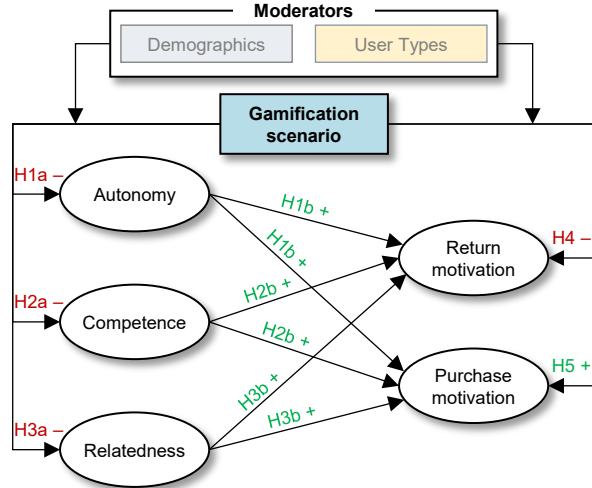


Figure 1. Conceptual model

5. Research method

5.1. Research design, data collection, and sample characteristics

In our study, we used a gamification approach called "Return Game", which featured the core game design elements related to challenge-based gamification: points, badges, a challenge, and a leaderboard. We utilized a storyboard to graphically depict our gamification scenario. Storyboards can be used to illustrate interfaces and usage contexts to help survey participants imagine how a gamification approach would look in a real gamified system (Santos et al., 2021). In our storyboard, we presented the survey participants with a fictitious online shop called Fashionstore.com including the shop's general terms and conditions. Fashionstore.com offers a lenient return policy, including free shipping and 100-day free returns. The participants were then divided into two groups. The control group (CG) viewed only the general terms and conditions of the online shop. In the gamification group (GG), participants were introduced to the "Return Game". Figure 2 illustrates the presented challenge-based gamification approach. In the "Return Game", participants can collect points for every item they keep. Points can also be collected for items that are returned if feedback or the reason for the return is given. Otherwise, no points are awarded. Based on the points collected, participants can reach levels and badges that are associated with various (non-monetary) rewards. After seeing the storyboard, respondents provided assessments on their purchase motivation (PM) and return motivation (RM). They rated their perceived autonomy (A), competence (C), and relatedness (R) in the context of the presented online shop. In addition,

participants reported their perception of the authenticity of the scenario. Respondents then rated statements about their gamification user type (UT) and finally provided some personal information. It is important to note that in the control group (CG), participants answered the questions about the UT without having seen a gamification scenario. In the gamification group (GG), the participants answered the corresponding questions after being presented with the scenario. This may be a potential source of bias, as the CG only involved a self-assessment without specific game elements. However, no big differences were observed in the distribution of UTs between the two groups, indicating that the presence or absence of a gamification scenario did not influence the responses. Responses were measured on a seven-point Likert scale ranging from 1 (“strongly disagree”) to 7 (“strongly agree”). Established scales from previous literature were used to measure all constructs (A, C, R, PM, RM, and UT) and were adapted to fit the context of this study (see our digital appendix for the complete questionnaire). Additionally, participants were asked about their shopping frequency and amount, as well as their return frequency.

We conducted a pretest of the experimental design prior to the field phase to ensure the comprehensibility and logical consistency of the questionnaire. The final survey took place in May 2024 and resulted in 1022 completed questionnaires. During data cleaning, participants with inaccurate responses to control or attention test questions were excluded from subsequent analyses. The final data set consisted of 1010 completed

Table 1. Sociodemographic data of the sample

	Total	CG	GG
<i>n</i> =	1010	511	499
	(100%)	(50.6%)	(49.4%)
<i>Gender</i>			
Male	50.7%	49.7%	51.7%
Female	47.1%	47.6%	46.7%
Nonbinary	2.2%	2.7%	1.6%
<i>Average age</i>	39.48 years	38.50 years	40.49 years
<i>Education</i>			
High school degree	31.3%	30.9%	31.7%
Bachelor’s degree	45.0%	45.4%	44.5%
Master’s degree	13.1%	13.7%	12.4%
Other	10.8%	10.0%	11.4%

questionnaires. We used the Prolific panel with which we were able to obtain a sample that is representative of a large portion of society in terms of age, gender, and education. Detailed demographic data for each group and the overall sample are shown in Table 1. The results of the realism assessment showed that respondents perceived the scenarios to be realistic. On a Likert scale with a neutral midpoint of 4 and a maximum of 7 (i.e., “strongly agree” that the scenario was realistic) the CG averaged 5.45, and the GG averaged 4.92.

5.2. Validity and reliability assessment

Since all variables were self-reported, there could be a common method bias in our data set. To address this, we applied Harman’s one-factor analysis. The result of this test indicated that one factor explained 25.2% of the variance, which is less than 50%.



Figure 2. The displayed challenge-based gamification scenario

Therefore, the critical influence of common method bias was probably not present in our data set. We then assessed the validity and reliability of the model by conducting an exploratory factor analysis (EFA) to extract and validate the most significant independent factors (i.e., the latent variables). The EFA results indicated that each observed variable sufficiently loaded on its corresponding latent variable (A, C, R, PM, or RM), with all loadings being statistically significant across all groups. To ensure the selection of appropriate variables, we followed recommendations from the EFA literature (e.g., Conway & Huffcutt, 2003). Specifically, we selected the maximum likelihood method with oblique rotation (direct oblimin) due to our assumption of correlations between the variables A, C, R, RM, and PM in our proposed model. Bartlett's test of sphericity was significant ($p < .001$), and the Kaiser-Meyer-Olkin measure of sampling adequacy was .929, representing a "marvelous" factor analysis (Field, 2013). Convergent validity was assessed using average variance extracted, while composite reliability and Cronbach's alpha (all values $> .800$) were calculated to assess internal consistency (see our digital appendix).

5.3. Model fit statistics

We used structural equation modeling (SEM) to test our hypothesized research model, which allowed us to evaluate both the measurement and structural model simultaneously. We used the R package "lavaan" for our analysis. The assessment of normality using the "mardia" test revealed non-normality in the data. Therefore, we chose the robust "MLMV" estimator (mean and variance corrections) for our model. This estimator often provides the most accurate results (Gao et al., 2020). The calculated model fit indices show that the model fits the observed data well: The Comparative Fit Index (CFI) = .975 and Tucker Lewis Index (TLI) = .970 indicate an excellent fit ($\geq .95$; West et al., 2012). Root Mean Square Error of Approximation (RMSEA) values $\leq .05$ are considered good (Fabrigar et al., 1999), accordingly the RMSEA = .050 of our model is good. Standardized Root Mean Square Residual (SRMR) values $\leq .05$ are acceptable (Diamantopoulos & Sigauw, 2000). Therefore, our SRMR = .041 is acceptable. Thus, we can conclude that our SEM is probably valid, and that the theoretical model fits the collected data well.

6. Results and discussion

The fitted structural equation model in Figure 3 shows the group comparison between the control group and the gamification group. The comparison shows negative regression coefficients (β) for the paths from gamification (G) to purchase motivation and return

motivation ($\beta_{G \rightarrow PM} = -.365^{**}$; $\beta_{G \rightarrow RM} = -.195^{**}$). This indicates that the presented gamification scenario directly reduces return motivation and purchase motivation, while the resulting reduction in PM appears to be stronger. The negative effect on PM could be explained as follows: A reduction in RM also leads to a reduction in PM, as orders that would have been returned are prevented to some extent. Such a theoretically possible effect could be positive because it reduces unsustainable behavior. However, even if such an effect were present, it could not explain the entire decrease in PM. The comparatively strong reduction in PM certainly warrants further investigation, as it could make a gamification approach such as ours financially unattractive to online retailers.

In terms of the basic psychological needs, gamification has a small but significant impact on autonomy and relatedness. While perceived autonomy is reduced, gamification increases relatedness ($\beta_{G \rightarrow A} = -.194^{**}$; $\beta_{G \rightarrow R} = .195^{**}$). This may be the case because in our scenario, participants could even earn points for returning a product by providing the return reason or giving feedback about the product. This may have increased their sense of being understood but also a sense of being helpful for others and promoted their perceived relatedness.

Perceived autonomy and relatedness correlate quite strongly with purchase motivation ($\beta_{A \rightarrow PM} = .587^{**}$; $\beta_{R \rightarrow PM} = .467^{**}$), whereas the other correlations between A/C/R and RM/PM are rather weak. After the direct effect on PM, perceived autonomy is the main driver for PM but it does not affect RM. Return motivation is often a reaction to dissatisfaction rather than a proactive decision. The focus is on correcting a situation (e.g., returning a product), and not on autonomy in the decision-making process. Therefore, it seems logical

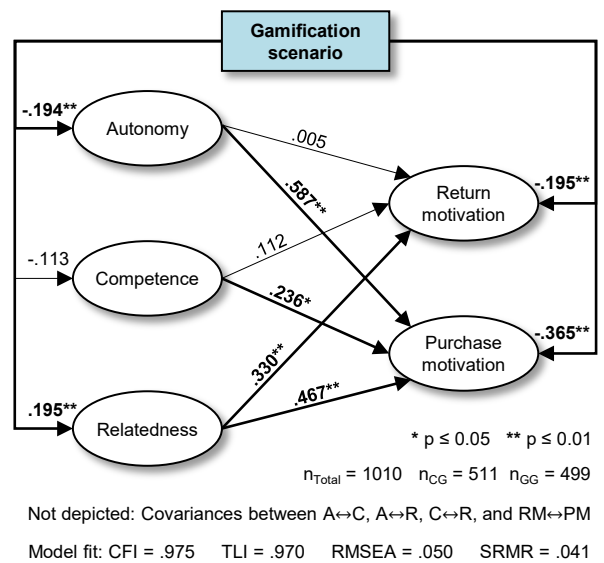


Figure 3. SEM results

that A has a strong influence on PM, but hardly any influence on RM. Similarly, perceived competence only has a significant influence on PM ($\beta_{C \rightarrow PM} = .236^*$), but not on RM, suggesting that the more competent a person feels in using the online shop, the higher the PM. Perceived relatedness has a positive effect on both PM and RM ($\beta_{R \rightarrow PM} = .467^{**}$; $\beta_{R \rightarrow RM} = .330^{**}$), but the effect on PM is stronger. It seems that the more someone identifies with the online shop, the more likely they are to buy or return something. The overall effect of an increased relatedness need satisfaction is probably positive because people do not send back everything they buy. Therefore, interestingly and contrary to our hypotheses, challenge-based gamification seems to be a suitable approach to increase perceived relatedness, although in our case it also has negative side effects (decreased PM) of an indirect (intrinsic) and direct (probably more extrinsic) nature.

In summary, we can only partially accept H1 ($G \rightarrow A \downarrow \rightarrow RM/PM \downarrow$), because only the first path ($G \rightarrow A \downarrow$) and $A \downarrow \rightarrow PM \downarrow$ are supported, while $A \downarrow \rightarrow RM \downarrow$ is not significant in our model. Similarly, we can only partially accept H2 ($G \rightarrow C \downarrow \rightarrow RM/PM \downarrow$) because only $C \downarrow \rightarrow PM \downarrow$ is supported. Finally, we only partially accept H3 ($G \rightarrow R \downarrow \rightarrow RM/PM \downarrow$) because $G \rightarrow R \uparrow$. Furthermore, the direct effect on PM and RM is stronger than the indirect effect (mediated by A/C/R). The indirect effect on PM is ambiguous, as gamification reduces perceived autonomy on the one hand, but positively influences relatedness on the other. Because of the direct negative effect on RM and PM we accept our hypothesis H4 ($G \rightarrow RM \downarrow$) and reject H5 ($G \rightarrow PM \uparrow$).

To examine the gamification user types (UT), we assigned the participants to the different UTs according to Krath et al. (2023). This was done by calculating the sum of the item scores per UT and then comparing the sums across the 6 UTs. If a person had their high score (e.g., 28) for both Achiever and Philanthropist, that person was assigned to both groups (i.e., double counted). Looking at Table 2, we see that most of the participants in our survey were Achievers, Philanthropists, Free Spirits, and Players. Only a few people are Socializers and almost none are Disruptors. An examination of the correlations between the UTs shows that some types are strongly correlated with each other. In addition, we conducted an exploratory factor analysis of the hexad scale, which revealed many cross-loadings between items indicating that some types are very similar (see our digital appendix).

Given that our data is not normally distributed, we conducted U-tests to compare the user types (Control Group CG vs. Gamification Group GG) with regard to A, C, R, PM and RM (significant differences are highlighted in Table 2). Although the sample sizes for the group comparisons are relatively small (e.g.,

Table 2. User types and mean comparisons

Control (n=762)		Hexad gamification user types					
		Ach	Phil	Free	Play	Soc	Disr
Count		169	208	148	168	55	14
% share		22%	27%	19%	22%	7%	2%
mean scores	Hexad type	6.39	6.26	6.12	6.16	6.30	5.68
	Autonomy	5.95*	5.94	5.76	5.84	6.01	5.36
	Competence	5.33	5.31	5.18	5.36	5.61	5.23
	Relatedness	4.11	4.03*	3.81	4.13	4.75	4.52
	Purchase Motivation	5.27**	5.30*	5.00	5.25	5.59*	4.74
	Return Motivation	4.31	4.31	4.27	4.34	4.87	4.79

Gamification (n=795)		Hexad gamification user types					
		Ach	Phil	Free	Play	Soc	Disr
Count		203	196	159	171	59	7
% share		26%	25%	20%	22%	7%	1%
mean scores	Hexad type	6.34	6.35	6.18	6.23	6.38	5.71
	Autonomy	5.63*	5.74	5.62	5.67	5.58	4.96
	Competence	5.22	5.28	5.09	5.24	5.38	4.71
	Relatedness	4.40	4.36*	4.15	4.30	4.62	4.11
	Purchase Motivation	4.83**	5.02*	4.70	5.00	5.00*	4.20
	Return Motivation	4.17	4.17	4.07	4.16	4.56	3.71

Reading example: The average reported autonomy of Achievers is significantly higher in the control group (5.95 vs. 5.63). * $p \leq .05$, ** $p \leq .01$

Achiever_{CG} n=169 vs. Achiever_{GG} n=203), we still found statistically significant results. These findings suggest that the effects are likely to be profound.

For Achievers, our challenge-based gamification approach resulted in a statistically significant reduction in the perceived autonomy ($A_{CG} = 5.95$ vs. $A_{GG} = 5.63$) and an even stronger reduction in purchase motivation ($PM_{CG} = 5.27$ vs. $PM_{GG} = 4.83$). Achievers value goals and challenges, but also want to find their own ways and methods. Our gamification scenario could be perceived as reducing freedom and therefore reducing their perceived autonomy. The strong reduction in PM seems to be logical, given that A correlates strongly with PM.

Our gamification approach also led to a reduction in purchase motivation among Philanthropists ($PM_{CG} = 5.30$ vs. $PM_{GG} = 5.02$). In addition, a significant increase in perceived relatedness was observed ($R_{CG} = 4.03$ vs. $R_{GG} = 4.36$). Philanthropists are characterized by a desire to help others and to be perceived as valuable. Our game design allows consumers to return products and still receive points. This may lead to higher perceived relatedness because Philanthropists feel valuable and helpful when providing feedback on their returns.

For Socializers, the results indicate that our gamification scenario also led to a significant reduction in purchase motivation ($PM_{CG} = 5.59$ vs. $PM_{GG} = 5.00$). Socializers seem to be rather intrinsically motivated (by A/C/R need satisfaction) and may react negatively to our overstimulating gamification scenario in terms of the basic psychological needs.

Furthermore, we conducted regression and moderation analyses with demographic characteristics (gender, age, education), which yielded only a few

significant effects. Consistent with the hexad literature, our data show that consumers cannot be clearly assigned to a specific user type, and the results should therefore be interpreted as tendencies of the individual user types. Accordingly, we performed the following analyses with the numerical user type scores (ranging from min=4 to max=28 per user type). We find that as individuals age, their tendency to be Philanthropists or Free Spirits increase while the Disruptor tendency decreases. In terms of gender, our results indicate that women are less likely to score high on the Player and Disruptor scale and more likely to score high on the Philanthropist and Free Spirit scale.

Finally, we also conducted moderation analyses against perceived A, C, R, PM, and RM, the significant results of which are visualized in Figure 4. Our moderation tests with the user type scores only revealed significant effects for the Achievers, Philanthropists and Free Spirits scales. In the GG, the Achiever scores are more strongly correlated with the competence scores

than in the CG. On average, achievement is positively correlated with competence. It is therefore natural for Achievers to see themselves as competent, and vice versa. Gamification seems to highlight this, as individuals are rewarded for their achievements. In the GG, the correlation between the Philanthropist scores and the competence scores is also stronger than in the CG. This seems to be logical, given that Philanthropists like to help others. To be considered a Philanthropist, one must have the competence to help others and rate oneself accordingly. Lastly, the correlation between the Free Spirit score and the relatedness score is significantly stronger in the GG than in the CG. In our scenario, there are different ways to play the “Return Game” and collect points (e.g., by returning or not returning). The Free Spirit values autonomy and discovery and is therefore more likely to identify with and relate to an online shop that offers such freedoms.

7. Conclusion, limitations, and outlook

Our findings are highly relevant not only to academia but also to business practice. The findings of this study contribute to the advancement of research in the field of gamification, demonstrating that it is a promising tool for increasing awareness about returns. It allows customers to experience a direct connection to their personal return behavior. However, our results also indicate that our challenge-based gamification approach not only affects return motivation, but also has a negative side effect on purchase motivation. In line with the existing gamification literature, we also find mixed results regarding the effects of gamification (Tobon et al., 2020). This may be because our gamification approach can be seen as a “dark pattern”. Since we are trying to influence consumer behavior with our approach, customers may perceive it as unethical or less enjoyable, which could affect the credibility of the online shop and thus reduce purchase motivation. Gamification has many forms and areas of application, which is why our results cannot be generalized to all contexts. However, our study has a high practical value because “dark pattern” gamification designs are often used in practice (e.g., in customer loyalty programs).

In our gamification scenario, we deliberately chose the PBL approach, as online shoppers are familiar with points and rewards from loyalty programs. According to Tondello et al. (2016), with our game design, we are only targeting individuals who scored high on the hexad player type dimensions of Achiever and Player. While this can be a limitation, it is probably not too limiting, as participants are a mix of several user types and may respond to a variety of game elements. In this respect, we appeal to many individuals with our approach, as we address not only the “pure” Achievers and Players, but

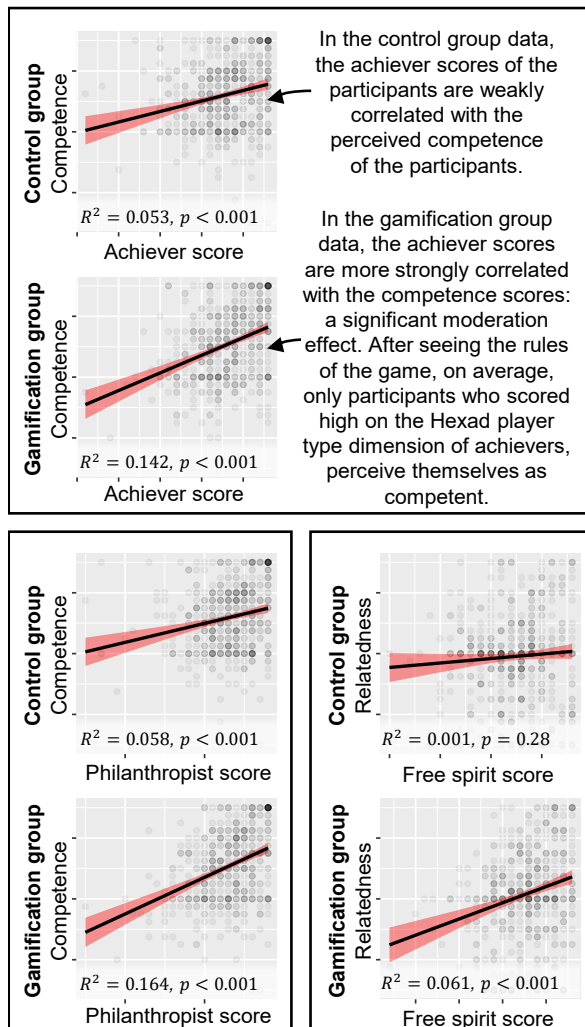


Figure 4. Significant moderations

also to hybrid types with strong Achiever and Player tendencies. Tailored gamification may not be the optimal solution for a heterogeneous group of user types, as it is only effective when user types are clearly defined. In any case, and for almost every user type, gamification seems to be an appropriate means to increase the relatedness with the online shop.

Another notable limitation of this study is that our scenario was not a repetitive game. Therefore, we cannot make any statements about the temporal effectiveness of gamification. Long-term effects may be achieved through internalization of extrinsic motivation. The complexity of our gamification scenario may hinder its ability to foster intrinsic motivation. Adopting a simpler and more accessible gamification design could potentially yield more favorable and sustained outcomes. Additionally, it should be noted that the present study is based on self-reported data from Prolific panel users, which may be a source of bias. To address these limitations and advance scientific understanding in this field, future studies should employ a repeated game to gain a comprehensive understanding of long-term and learning effects or collaborate with a real online shop utilizing authentic customer data. Future research may also examine the influence and correlation of different shopping, return, or player types.

8. Link to our digital appendix

dx.doi.org/10.6084/m9.figshare.26029678

9. References

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