

# Hyperpersonalization in E-Commerce - Effects on Consumer Perception and Behavior

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## ABSTRACT

This study examines the effects and perceptions of hyperpersonalization in the German e-commerce market using a mixed-methods approach. Despite the strong data privacy awareness in Germany, the study shows that widespread concerns about data privacy and personal information protection do not have a significant impact on the acceptance of personalized advertising. This finding is particularly noteworthy as it suggests that the perceived benefits of hyperpersonalization outweigh the potential risks for many consumers. The research results highlight that hyperpersonalization can be an effective tool to enhance the relevance of advertising and positively influence purchasing behavior. However, this is only the case when companies carefully balance personalization with the protection of consumer privacy. In sensitive product categories, a cautious and well-considered approach is required to gain and maintain customer trust. Companies need to further develop their personalization strategies to meet the diverse needs and expectations of different target groups, especially in sensitive product categories.

**Keywords:** Hyperpersonalization, SOR Model, E-commerce, Mixed-Model, Consumer Behavior

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## 1. Introduction

The accelerating development of the internet and digital technologies has fundamentally transformed commerce, thereby driving e-commerce (Deges, 2023). Within this highly dynamic competitive environment, the personalization of marketing strategies has become a central and indispensable component for addressing the continually evolving expectations and demands of consumers (Raji et al., 2024).

Hyperpersonalization (HP), as the focus of this study, transcends traditional personalization approaches, which were typically restricted to simplistic demographic data or purchase histories. Instead, it leverages extensive data analytics and artificial intelligence to address individual customers in real-time (Shukla & Nigam, 2018). This advanced methodology promises to enhance the customer experience substantially while simultaneously conferring significant competitive advantages upon businesses (Türling, 2021).

The increasing criticality of HP in e-commerce is attributable not solely to the proliferation of digital technologies but also to fundamental shifts in consumer behavior. Contemporary consumers expect personalized, highly tailored shopping experiences that are precisely aligned with their individual needs and preferences (Deges, 2023). To meet these elevated expectations, companies are increasingly deploying personalized marketing strategies and sophisticated technologies that facilitate comprehensive analysis of customer behavior. Conversely,

organizations failing to meet these high expectations risk losing market share to competitors. Empirical studies confirm that personalized advertising and product recommendations can significantly elevate consumer purchase intention and satisfaction (Desai, 2016; Thongpapanl & Ashraf, 2011). Furthermore, personalization contributes to enhanced customer loyalty by fostering a perception that consumers' unique needs and preferences are recognized and valued (Peppers & Rogers, 2017). As a forward-looking marketing strategy, HP is anticipated to gain even greater prominence in the ensuing years, driven by the continuous technological advancements in AI, which will provide companies with expanded capabilities to individually target customers and deliver memorable shopping experiences (Ilicic, 2022).

Notwithstanding these benefits, organizations face the critical strategic challenge of establishing a precise equilibrium between effective personalization and ensuring customer privacy (Deges, 2023). The perceived efficacy and subsequent acceptance of HP are crucial determinants of this technology's success (Chandra et al., 2022). While a segment of consumers recognizes the benefits and finds personalized offerings valuable, others articulate substantial concerns regarding the associated data privacy risks and the potential erosion of their privacy (Horne et al., 2007). This inherent cognitive dissonance is often described as the Privacy Paradox, wherein consumers voice data privacy concerns yet demonstrate a willingness to disclose personal data in exchange for a demonstrably enhanced purchasing experience (Kokolakis, 2017). Therefore, empirical analysis is essential to precisely ascertain consumers' perception of HP and the factors governing its acceptance.

HP possesses the capacity to influence consumer behavior positively in multiple dimensions, potentially resulting in elevated purchase willingness, improved customer satisfaction, and strengthened customer loyalty (Engels & Grunewald, 2017; Kwon & Kim, 2012). Concurrently, however, negative externalities may arise, such as a sense of surveillance or perceived manipulation by corporate entities. The implementation of HP thus introduces a range of ethical considerations, with the protection of privacy and the responsible stewardship of customer data constituting fundamental challenges (Leimstoll, 2009).

The classical concept of personalization has significantly advanced within both academic research and practical application, evolving from merely personalized to highly personalized customer communication (Shukla & Nigam, 2018). Traditional personalization involved basic content adjustments based on simple data points such as name, gender, or past user purchases, improving content relevance but often remaining superficial, failing to incorporate comprehensive behavioral data and real-time customer interactions (Ilicic, 2022). Evolved customer expectations now demand that businesses engage precisely across the entire customer journey, addressing individual needs and preferences by delivering relevant information at the optimal time, exceeding conventional stages of personalization (Türling, 2021).

HP aligns content and offers precisely with the individual preferences, needs, and behavioral patterns of customers. Content adaptation extends not only to specific user preferences but also incorporates their current intent and buyer persona, all processed in real-time (Ilicic, 2022). This requires the contextually relevant and real-time utilization of browsing and behavioral data to shape individual customer communication. It integrates sophisticated technologies, such as artificial intelligence and machine learning, to develop a deeper understanding of customers and present them with customized content and offers (Al Prince et al., 2025; Heinemann, 2023). This approach, encompassing a holistic, up-to-date customer understanding, aims to enhance customer satisfaction and loyalty (Gouthier & Kern, 2021; Stahl et al., 2012). HP maximizes individual benefit and strives for exceptionally high relevance by considering not just individual preferences, but also current mood, context, and even predicted needs based on complex data analysis. It is important to note that, despite subtle

conceptual differences, the terms personalization and HP are often used synonymously in academic literature.

The ultimate objective of personalization is articulated as enhancing customer satisfaction. Surveys indicate that 60% of online shoppers heed suggestions from retailers recommending potentially interesting items, with a majority concurring that recommendations align well with their purchasing interests. Furthermore, 39% of respondents report frequently purchasing products suggested through personalization measures. Empirical findings underscore the necessity of integrating personalized strategies: 71% of respondents expect personalized interactions from companies, and 76% express disappointment when these expectations are unmet (Arora et al., 2021; Desai, 2016). A significant majority (80%) of consumers report a greater propensity to complete an online purchase with brands offering a personalized customer experience, and 72% claim to interact exclusively with personalized communications. From a purely economic perspective, studies indicate that implementing personalization measures can yield revenue increases of up to 30% and reduce marketing costs by up to 20% (McKinsey, 2018). These metrics emphasize the crucial relevance of personalization in the contemporary marketing landscape (Healy, 2022).

The necessity of HP stems from continually shifting customer expectations, which demand individualized and inspiring customer experiences (Deges, 2023). HP cultivates the impression that the brand message was developed specifically for the individual customer, leading to its identification as one-to-one marketing (Heinemann, 2023). Consumers today face an extensive range of products and services, where the sheer variety of options can induce cognitive overload, complicating the purchase decision process. This information overload can particularly overwhelm uncertain customers who experience difficulty making decisions (Deges, 2023; Walsh, 2002). The paradox of choice describes the phenomenon where increased selection does not invariably lead to better decision-making, often resulting in overwhelm, dissatisfaction, and decision paralysis. Studies confirm that consumers choosing from numerous options experience lower satisfaction and greater regret regarding their decisions (Iyengar & Lepper, 2000). Conversely, personalized marketing, particularly through consumer-centric recommendation systems, can mitigate information overload, concurrently enhancing customers' cognitive capacity and satisfaction (Kwon & Kim, 2012; Thongpapanl & Ashraf, 2011; Ting-Peng et al., 2007).

When brands successfully apply HP, they provide an exceptional customer journey through tailored messages, product recommendations, offers, and specialized content based on user requirements and expectations (Healy, 2022).

Current research, as detailed in Table 1, suggests numerous positive outcomes of personalization on the user experience and purchasing behavior, including increased conversion rates, heightened purchase volume, and greater customer loyalty. Personalized experiences lead to higher satisfaction, increased time spent on websites, and stronger loyalty, as users who feel understood and valued are more inclined to repurchase and recommend the brand. However, the literature also emphasizes persistent challenges, particularly concerns regarding data protection and privacy, which may negatively affect consumer engagement. Personalization is maximally effective when it improves the information and purchasing process while simultaneously bolstering user trust. The Stimulus-Organism-Response (S-O-R) model is frequently utilized to examine the effects of personalized marketing (Stimulus) as processed through consumer perceptions and emotions (Organism), leading to specific behavioral outcomes (Response). Stimuli include product recommendations, personalized banners, and tailored email campaigns. Positive emotional responses, e.g., satisfaction and interest, can enhance purchase intent and brand loyalty. Conversely, if personalization is

perceived as intrusive or irrelevant, it can induce negative emotions such as irritation or concern, leading customers to feel monitored or manipulated. Trust in the retailer is a key moderating factor.

*Table 1. Synopsis Table for the Literature Review*

<b>Authors</b>	<b>Insights</b>
Desai (2016)	Personalized recommendations lead to a higher conversion rate Customers spend more time on websites that offer personalized content Customer satisfaction and loyalty increases Concerns about data protection and privacy
Dzulfikar et al. (2018)	Classification of personalization characteristics in four dimensions: architectural, relational, instrumental, and commercial Instrumental and commercial personalization are the most popular in academic literature Relational personalization is gaining in importance due to the growth of social media
Kim et al. (2019)	Transparency can reduce the effectiveness of adverts, if unauthorized information flows are revealed Trust in a platform can have a negative effect diminish Transparency about acceptable information flows can increase the effectiveness of adverts if trust in the platform is high Privacy concerns outweigh the interest in personalized ads if unauthorized information flows are disclosed
Bhushan (2018)	Personalization increases conversion rates in e-commerce by an average of 25 % Challenges: managing large amounts of data, real-time processing, and ensuring privacy Personalization can put customers off if it is perceived as too intrusive or irrelevant
Ho (2009)	Personalization offers significant business opportunities but also challenges, such as data protection concerns Users have high expectations but also strong concerns about their privacy Users are willing to share personal information to share personal information if it means they receive high-quality services
Anshari et al. (2019)	Big data enables precise customer profiles and improves business decisions Personalization increases customer loyalty Challenges: technical support, linking of online and offline data, data authenticity
Kaptein and Parvinen (2015)	Personalization must meet both psychological and technological requirements Personalization strategies (e.g., scarcity) can significantly influence customer behavior Technological flexibility and the ability to adapt content in real time are crucial Use of adaptive personalization measures increases click-through rate significantly (9% to 14%)
Aguirre et al. (2016)	Personalization can both increase and decrease consumer engagement when privacy concerns exist Companies need to be strategic to the paradox of personalization and privacy to gain consumer trust
Lee and Kwon (2008)	Recommendation systems improve consumers' satisfaction with their choices and their attitude towards the products They lead to positive purchase intentions and increase actual purchases
Bleier and Eisenbeiss (2015)	Trust in the retailer moderates the effect of personalized ads High trustworthiness means that in-depth ads are perceived as more useful For less trustworthy retailers, highly personalized ads trigger reactance and privacy concerns

Authors	Insights
Balan and Mathew (2016)	Personalization leads to users adding and removing fewer products from their shopping basket. This indicates a lower cognitive burden Personalization makes the search for information more efficient (people with personalized content are less likely to search for more information)
Raji et al. (2024)	AI-driven personalization techniques are influencing the purchasing decisions of consumers, simplifying the buying process, and significantly increasing customer retention, satisfaction, and loyalty significantly Challenges: Data protection, balance between personalization and privacy Continuous improvement of personalization promotes long-term customer loyalty
Li and Wang (2013)	Personalized recommendation systems help to reduce information overload and create the feeling that the user is in a one-to-one dialogue with the website Higher levels of personalization lead to a stronger perception of social presence and therefore greater trust in the website
de Keyser et al. (2015)	AI-driven personalized marketing strategies increase the effectiveness of advertising campaigns and promote customer loyalty High relevance of real-time data and machine learning in personalization
Grandhi et al. (2021)	Personalized product recommendations significantly increase customer satisfaction and loyalty, which leads to higher conversion rates and increased turnover The customer-centered approaches improve the overall perception of the brand and promote customer loyalty Implementation challenge: data protection and customers' concerns about their privacy
Ting-Peng et al. (2007)	Personalized content can significantly increase user relevance, especially if they provide relevant and interesting information Personalization can reduce information overload, which leads to higher satisfaction

While the potential utility of personalized measures is extensively documented in academic literature, a deficit persists in comprehensive studies that specifically examine the contextual effects and acceptance of these strategies within the German e-commerce market. Mehmood et al. (2025) indicates that it becomes increasingly more important to consider cultural particularities when conducting studies on HP. In Germany, the implementation of HP presents a complex challenge, given the country's stringent data protection legislation and the high level of data privacy sensitivity demonstrated by German consumers (Acxiom, 2022). Consequently, this research is dedicated to investigating the perception and behavioral effects of HP in e-commerce from a consumer perspective.

The primary objective of this work is to develop a profound comprehension of the perception and impact of HP within the e-commerce domain. This includes the investigation of both the potential positive effects on consumer behavior and possible negative consumer reactions, such as data privacy reservations or the explicit rejection of personalized offers. The derived, evidence-based insights are intended to support companies in optimizing their personalization strategies while simultaneously ensuring compliance with data protection requirements and maximizing customer acceptance. The study's focus is divided into two main thematic areas, i.e., the perception of HP and its effects on consumer behavior. These research hypotheses deduced in the next section are integrated into an S-O-R model framework to provide a systematic analysis of consumer responses to hyperpersonalized strategies. Results and a discussion of the hypotheses are presented in the third section of this article. The fourth section

provides a conclusion, focusing on the practical implications of the study results and related limitations leading to the development of future research options.

## 2. Methodology

### 2.1. Research Design and Research Questions

The present study is methodologically structured to investigate the perception and effects of HP, specifically within the context of the German e-commerce market. While numerous prior studies have explored the generalized advantages and complexities associated with personalization, a comprehensive analysis focusing specifically on the acceptance and impact of HP within the German context has been largely absent. This geographic focus is critically important due to Germany's pronounced regulatory environment and high consumer sensitivity concerning data privacy and protection. The methodological design aims to address this research gap by explicitly focusing on the specific dynamics and challenges inherent to this market segment.

Empirical evidence indicates that German consumers harbor significant doubts regarding the sufficient protection of their personal information, with 56% expressing skepticism about data security and 55% reporting a perceived lack of control over their internet data (Sinus Institut, 2018). Furthermore, while the percentage of consumers expressing data protection concerns slightly decreased to 63% in 2022 from 66% in 2018, this high level of concern remains a critical factor (Acxiom, 2022). These pervasive privacy concerns possess the potential to significantly influence consumer behavior and the ultimate acceptance of personalized marketing measures. Consequently, the German market provides a compelling case for an in-depth examination of HP's impact on both consumer perception and purchasing behavior.

The overarching objective of the research is to attain an understanding of these specific dynamics within German e-commerce. The investigation is systematically structured into two principal analytical domains, which are subsequently operationalized through six detailed research questions designed to enable a comprehensive evaluation of HP.

The initial domain of inquiry focuses on understanding how consumers perceive personalized marketing strategies and identifying the specific factors that modulate their acceptance. This analysis begins with an assessment of the fundamental consumer attitude toward personalized communication.

Existing literature suggests that personalized experiences evoke positive emotional responses, such as enjoyment and enthusiasm, as they are tailored to individual customer interests and preferences, thereby making customers feel valued and understood (Bleier & Eisenbeiss, 2015; Desai, 2016; Grandhi et al., 2021; Raji et al., 2024). However, personalization can also elicit negative emotions, such as discomfort or defensive reactions, if perceived as intrusive or overly intrusive (Bhushan, 2018; Kim et al., 2019). Despite the duality, the prevailing emphasis in research on the positive emotional responses generated by well-executed personalization supports the following hypothesis.

H1a: Consumers exhibit an overall more positive attitude toward personalized marketing strategies compared to standardized advertising.

The second question within this domain addresses the influence of trust, a widely recognized moderator in digital commerce. Academic studies strongly indicate that trust in a brand significantly increases the acceptance of personalized advertising (Bleier & Eisenbeiss, 2015; Li & Wang, 2013). High trust makes consumers more inclined to accept personalized offers as

helpful and useful (Bleier & Eisenbeiss, 2015; Kim et al., 2019). Furthermore, transparency concerning data usage—where companies clearly and openly communicate how data is collected and utilized—is considered a crucial factor, strengthening consumer trust and the willingness to share data, thereby increasing the acceptance of HP (Aguirre et al., 2016; Kim et al., 2019). The following hypothesis emerges.

H1b: A high degree of trust toward a company positively influences the acceptance of HP.

The final question on perception analyzes the contextual dependency of HP. Research suggests that consumers perceive personalized advertising more positively in less sensitive categories, such as entertainment or general consumer goods, compared to highly sensitive domains, such as health or finance (Kaptein & Parvinen, 2015; Lee & Kwon, 2008). Topics perceived as private or personal are often viewed critically, and personalized advertising in these sectors can be construed as invasive (Aguirre et al., 2016; Bhushan, 2018; Dolin et al., 2018). Consequently, the following hypothesis emerges.

H1c: The product category influences the perception of personalized advertising; personalized content is viewed more critically in sensitive areas.

The second domain of research concentrates on analyzing the practical effects of personalized content on customer behavior in e-commerce, including impacts on purchasing decisions and the overall customer-company relationship. Personalized marketing is known to substantially affect consumer purchase decisions (Kaptein & Parvinen, 2015). Studies have found that personalized recommendations and advertising enhance the perceived relevance and attractiveness of offers, thereby strengthening purchase intention (Bleier & Eisenbeiss, 2015; Raji et al., 2024). Specific research indicates that personalized measures can increase e-commerce conversion rates by an average of 25% (Bhushan, 2018). Given that HP aims to improve sales and strengthen customer loyalty (Deges, 2023), it is hypothesized to significantly influence purchasing decisions.

H2a: HP has a significant influence on consumer purchasing behavior.

Research suggests that hyperpersonalized measures improve the shopping experience, conveying to customers that their individual needs are recognized (Desai, 2016; Raji et al., 2024). This results in higher satisfaction with purchase decisions and a more favorable attitude toward the online store (Desai, 2016; Raji et al., 2024). Furthermore, personalized recommendation systems are shown to reduce information overload and mitigate suboptimal purchase decisions, increasing the cognitive capacity and satisfaction of customers (Kwon & Kim, 2012; Thongpapanl & Ashraf, 2011).

H2b: Consumers who receive personalized marketing strategies demonstrate increased satisfaction with the company.

While younger users are often considered more willing to adopt new technologies, contemporary trends show that older individuals are increasingly utilizing digital technologies and valuing personalized offers that simplify the shopping process. Studies suggest that personalized marketing increases satisfaction and loyalty largely independent of age or gender (Lee & Kwon, 2008). The fundamental consumer need for a simple, relevant, and efficient shopping experience is considered similar across demographic groups, suggesting that the positive effects of personalized measures are broadly consistent (Bleier & Eisenbeiss, 2015).

H2c: There is no significant difference in the effectiveness of personalized measures between different age groups or genders.

Collectively, these hypotheses provide a framework of the relationships and consumer reactions to personalized marketing strategies within the specific constraints of the German e-commerce environment. With the exception of H2c, they can be summarized in the Figure 1.

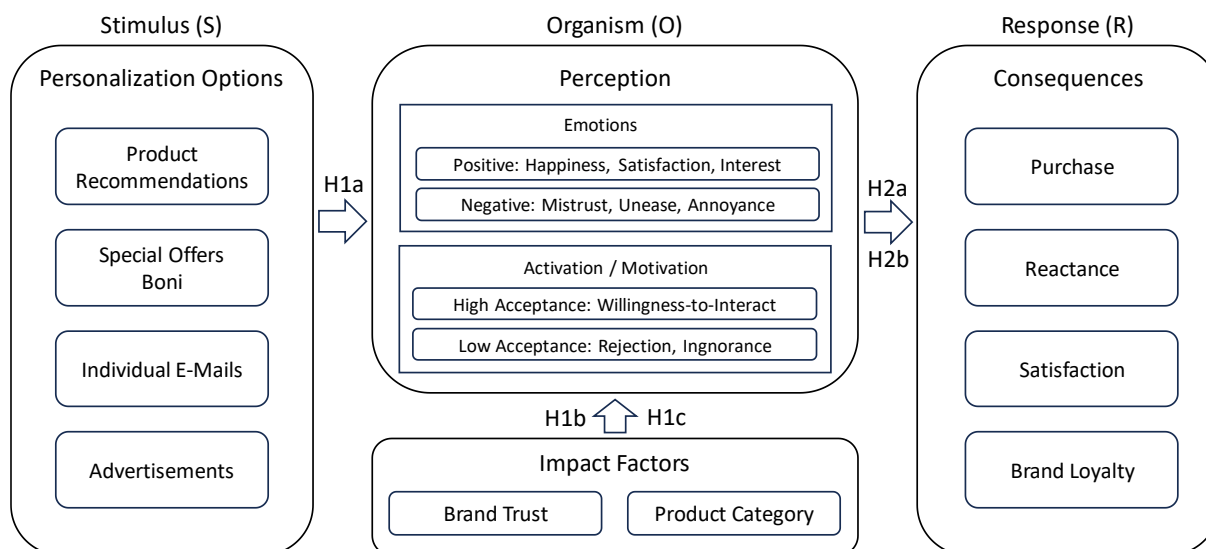


Figure 1. Research Design

At this point, it has to be stressed that research hypotheses deduced above can be illustrated in the framework of an SOR model. While the questionnaire does not operationalize the constructs linked in Figure 1 using pre-existing scales but, following the arguments by Mayring and Fenzl (2019) as well as Diamantopoulos et al. (2012), utilizes primarily single-item scales specifically chosen to operationalize the respective hypothesis. Only for positive and negative perceptions two-item scales are used each. Additionally satisfaction is measured using a three-item scale. While the product category is measured using five scales, they are introduced into the model as single-scale items. On the one hand they measure the different categories individually. On the other hand preliminary reliability and validity tests have revealed that summarizing them into a single item is not suitable as Cronbach's alpha, Rho A and Rho C all lie below the critical thresholds.

## 2.2. Preliminary Study: Expert Interviews

The qualitative phase of this mixed-method study was designed to enhance the subsequent quantitative study by providing context and practical perspectives on the underlying research objective.

The selection of experts was conducted to ensure a diverse yet highly informed range of perspectives concerning HP in e-commerce. A total of five interviews were executed. The experts held varied roles, spanning technical execution to strategic planning.

- I1 was employed as a junior manager in the customer insights and CRM operations domain.
- I3, held the title of associate consultant and was actively involved in a personalization-focused project.

- Three experts were affiliated with REWE Digital. I4, a data scientist, specialized in developing personalized recommendation systems. I2 and I5 served as product owner and business owner, respectively, within the personalization project team.

The collective value of these interviewees lay in their profound domain knowledge and direct practical experience in developing and implementing personalized marketing strategies. This expertise provided deep insights into the current challenges and critical success factors within the HP landscape. The diversity in their organizational roles, ranging from technical implementation to strategic planning, ensured a broad spectrum of perspectives on the topic.

The interview guide was constructed directly based on the established hypotheses utilizing semi-structured interviews, which afforded the experts greater latitude to elaborate.

The interview guide was segmented into six primary thematic areas:

1. **General Assessment:** Focused on evaluating the overall significance of HP in e-commerce, including the perceived benefits for both companies and customers.
2. **Application of HP:** Delved into the specific technologies and tools used for implementing HP strategies, addressing the role of artificial intelligence (AI) and integration into overall marketing frameworks.
3. **Data Management and Protection:** Investigated the types of data collected for personalization, their utilization methods, and the corporate measures taken to ensure compliance with data protection regulations, including secure data management.
4. **Customer Experience and Behavior:** Explored customer reactions to personalized content and offers, focusing on the impact of HP on customer satisfaction, loyalty, and retention.
5. **Challenges and Risks:** Addressed the practical difficulties encountered during the implementation of HP and explored potential risks and negative effects.
6. **Future Developments:** Concluded by inquiring about the anticipated future trajectory of HP in e-commerce, including new trends, innovations, and other relevant factors not yet covered.

The process of transliteration followed the established methodology by Mayring and Fenzl (2019). Since the six thematic areas already provide a categorical framework for the evaluation of the interviews, the analytical process followed a deductive approach. Consequently, the presentation of the results from the interviews also follows the structure set via the six topics.

To assure an objective analysis of the interview material, all three authors were involved in the analysis, and the presented results are the inter-coder consensus. Considering that all coders followed the same interpretation scheme established via the six main topics, no inconsistencies occurred during the conception of the consensus solution.

### **2.3. Consumer Survey**

The construction of the questionnaire was executed in alignment with the deduced hypotheses. The resultant instrument was specifically designed to capture consumers' perceptions and the behavioral impact of personalized marketing strategies within the e-commerce context. Various critical aspects were incorporated into the design to ensure the acquisition of comprehensive and statistically robust data.

Initial questions targeted demographic data, including age, gender, and internet usage behavior, which enabled subsequent analysis regarding whether demographic characteristics exert a differential influence on the perception of HP.

Furthermore, prior experiences with personalized advertising and established general attitudes toward it were queried, generating a foundational consumer sentiment baseline. To quantitatively assess the influence on purchasing behavior, specific questions were formulated concerning the frequency of purchases attributable to personalized advertising and the perceived utility of these marketing measures. Furthermore, critical factors influencing acceptance were measured through questions regarding the perceived necessity of data protection and the level of trust placed in various companies.

The instrument also included questions pertaining to the perception of personalized advertising across diverse product categories, designed to identify potential variations in acceptance and perceived utility contingent upon the specific product sector. Finally, to analyze the potential long-term strategic value of HP, the questionnaire addressed customer satisfaction with the overall shopping experience and evaluated the resultant effects on customer loyalty and retention. Single-item scales have been implemented following the arguments by Diamantopoulos et al. (2012). Additionally, the decision has been motivated to reduce the cognitive burden for participants by using single-item scales that could capture the relevant concepts sufficiently well.

Both parts of the empirical mixed-methods study were approved on April 14, 2025, by the ethics committee of the International School of Management and are registered under code K-2025-JP-11.

The interview guide implemented in the interview study and the questionnaire implemented in the quantitative survey are provided in the appendix. Considering that both parts of the study have been conducted in German with German participants, the appendix provides an English translation of the German original.

Both the interview guide and the questionnaire were validated via pretests, focusing in particular on the phrasing to assure uniform understanding across the participants and thus increase overall validity. The pretests for the quantitative survey also provided the baseline time necessary for completing it.

### **3. Results**

#### **3.1. Qualitative Preliminary Study**

The qualitative evaluation of the performed expert interviews provides critical insights into the implementation and strategic implications of HP within the German e-commerce sector. The consensus among the experts underscores the substantial significance of HP, characterizing it as an essential strategy for achieving market differentiation through the delivery of highly relevant and targeted offers (I1, I3 & I5). Experts universally agree that HP facilitates a superior customer experience and is now an integral component of modern digital commerce (I1-I5). The derived benefits extend to both consumers, through time savings and accelerated purchasing decisions, and organizations, via cost efficiency and optimized marketing strategies (I2, I3 & I4).

I1 asserts that HP is strategically vital given the intense competition and rapid development within the digital world, noting that customers now expect tailored experiences and information relevant to their individual needs. He emphasizes that via artificial intelligence and robust algorithms, HP ensures customers are only presented with products and information they are inclined to view. From a corporate perspective, I1 identifies advantages such as improved customer relationships, cost efficiency, and the securing of market position. He positions HP as one of the "most competition-decisive introductions in e-commerce" necessary for building

loyalty in an oversaturated market, concluding that businesses neglecting this implementation face existential challenges.

I5 supports this view, highlighting HP as a significant mechanism to attract customers and drive traffic. She reports quantifiable economic benefits, including positive revenue development and cost reduction, and deems personalized communication a necessity for effective customer loyalty programs. I4 characterizes HP as a "Win-Win-Situation," simultaneously reducing corporate costs and increasing revenue through enhanced customer activation. I2 contrasts HP with inefficient traditional marketing methods, such as scatter-loss-prone print circulars, asserting that HP enables precisely customized offers that significantly enhance customer perception and marketing efficiency. I3 further stresses HP's capacity to intensify customer loyalty and boost sales by offering relevant content at the precise time and place, even through marginal adjustments, citing personalized newsletters as an example that dramatically increases open and click-through rates.

The implementation of HP is fundamentally reliant on technology, with experts confirming the central role of artificial intelligence. Companies frequently develop proprietary AI algorithms trained on extensive customer datasets to discern complex purchasing patterns and generate personalized offers. Leonard details the use of centralized databases fed by information from partnerships, such as Payback, to facilitate these strategies. I2 and I5 detail the technological stack required, including specialized tools like Snowflake and Google Cloud for big data storage and processing, and programming languages such as Python for the development and training of AI and associated algorithms. Robert confirms the central importance of AI by stating it is the "heart of the whole thing," driving the calculation of a relevance score for each customer and coupon to ensure targeted distribution. Annalehn concurs, labeling AI the "heartpiece" of HP, essential for real-time analysis of data patterns, predictive modeling, and increasing the effectiveness of marketing efforts, particularly in smart couponing initiatives.

Data management and protection emerged as a critical discussion point, with universal expert agreement on the necessity of responsible data handling. Data collection is strictly conditional upon the customer's explicit, voluntary consent, which is communicated transparently and remains revocable at any time. Experts stress the critical nature of compliance with regulations like the GDPR (General Data Protection Regulation), relying on robust anonymization and security protocols to preserve customer trust. Laura affirms that data protection mandates are systemically integrated, and data is anonymized to prevent inference from concerning individual customers. The primary data collected are transaction data used to analyze shopping patterns. Leonard highlights the reciprocal relationship, noting that customers provide consent in exchange for an explicit added value—namely, specific hyperpersonalized offers. I4 confirms centralized mechanisms for executing customer rights (e.g., data deletion), ensuring consistent GDPR adherence across corporate product teams.

Regarding customer experience and behavior, personalized content is generally reported to be received favorably, leading to higher customer satisfaction and enhanced loyalty. Leonard underscores that relevant offers prevent customer frustration and foster a feeling of being valued, strengthening the customer journey. I2 reports a significantly higher redemption rate for personalized coupons, viewing this as evidence of customer satisfaction and positive reaction. However, I3 is unique in raising the critical risk of customers experiencing a perception of constant surveillance ("Big Brother is watching you"), which can erode privacy confidence and negatively affect acceptance. Laura acknowledges the existence of distinct customer segments, ranging from the unconcerned to those who fundamentally reject data disclosure, even when security measures are transparent. Despite the risks, experts confirm HP positively influences purchasing behavior. I4 provides quantitative evidence, stating that A/B

testing reveals a "statistically significant revenue uplift" attributable to personalized coupons. I3 reports that customers receiving regular HP offers exhibit a higher repurchase rate and longer customer lifetime.

The analysis of influence factors revealed differentiated opinions. I3 identifies brand trust as the paramount factor for acceptance. Conversely, Robert views the product category as the decisive determinant, particularly in Germany, where high security concerns may lead to a critical view of highly personalized offers, regardless of the brand's size. Most experts agree that the product category plays a critical role in acceptance: personalization is readily accepted for everyday consumer goods (e.g., food) but strongly resisted in sensitive or personal categories (e.g., intimate hygiene, finance, or health). Concerning demographics, Leonard and Annika initially suggest age and gender are irrelevant because most consumers are unaware of the underlying personalization. However, I2 and I3 offer counter-evidence, reporting that younger customers are generally more open to HP, while older customers exhibit greater caution, suggesting age does impact effectiveness.

The implementation of HP is hindered by several challenges and risks. Universal challenges include the high technological complexity and required effort, encompassing algorithm development, refinement, and real-time processing of massive data volumes. I1 stresses the complexity of ensuring correct data interpretation. Other obstacles cited include managing big data, high computing power requirements, political/organizational resistance to new technology investment, and difficulties in recruiting specialized AI personnel. Annika also notes the problem of unpredictable customer reactions, where expected successes fail to materialize, making strategic adjustment difficult.

Looking toward future developments, experts are unanimous that HP will remain critically important, with anticipated trends focusing on increased precision and speed, largely powered by advanced AI. I1 predicts that real-time personalized offers will become even more crucial, aiming for an experience where the customer feels fully understood and valued. I2 expects a shift toward total personalization—moving beyond standards to customize elements like coupon imagery and validity periods. Experts generally agree on the need for continuous technological optimization, including the development of smarter AI models to increase personalization efficiency. The overall trajectory is toward leveraging AI and innovative technologies to provide maximally individualized customer experiences.

## **3.2. Consumer Survey**

### **3.2.1 Description of the Sample**

The survey has been implemented as an online questionnaire. In addition to direct invitations, the questionnaire has been disseminated among special interest groups on digital marketing. Finally, it has been opened for interested individuals and distributed freely via the internet. Consequently, the implemented sample has to be considered a convenience sample, which possesses at least a passing interest in the topic of research.

Before the start of the data evaluation process, the data set has been cleaned for observations with missing values. Additionally, those observations were omitted from the sample where the time spent on the survey significantly deviated from the mean.

The cleaned data set contains 143 participants to assess the perception and effects of personalized marketing measures relative to standardized advertising. A sample size of 143 is sufficient considering that, following the Yamane formula, it results in a sampling error of less than 10%.

The participant cohort exhibited a distinct demographic composition. A significant majority of the respondents were female, accounting for approximately 66% of the sample. Notably, no participants registered as diverse. The sample demonstrated a high level of academic attainment, with over 60% possessing an academic degree. With a median age of 32.39 years, generations Z and Y were the most heavily represented ones.

Consequently, the data set cannot be considered to be perfectly representative of the German population. The topic of the survey requires that the participants can suitably reflect on their online shopping behavior and are familiar, at least on a rudimentary level, with personalization technologies. Thus, the high academic positioning of the sample, while not representative of the average German online shopper, fits the informed and reflective online shopper. Since generations Z and Y are considered to have the highest affinity with online technologies, the previous argument applies equally well regarding the age composition of the sample. We acknowledge, however, that potential bias resulting from the age composition might remain in the data set. Equally, the uneven gender distribution might introduce a second bias into the study. Consequently, both factors, age and gender, are controlled for in the further analysis.

Analysis of internet usage and online purchasing behavior was considered pertinent, as these factors influence the participants' exposure to digital marketing and prior experience with HP. The median internet usage amounts to 2.36 hours, and the median of participants shop online at least multiple times per week.

Thus, the analysis confirmed that most respondents were regularly exposed to and aware of digital marketing measures. Specifically, 96.5% of participants reported having consciously perceived personalized advertisements. The most frequently recognized personalized measures included product recommendations in online shops based on prior purchases and advertisements in social media or on websites tailored to previously viewed products.

When assessing the perceived advantages of personalization, the dominant positive aspect cited by 53.15% of respondents was more relevant offers. Other appreciated benefits included discovering new products (44.06%), receiving exclusive discounts and offers (41.26%), saving time when searching for products (37.76%), and encountering less irrelevant advertising (35.66%). Still, 18.18% perceived no advantages in personalization.

Regarding general attitude, 56.64% found personalized advertising more interesting than general advertising. A highly significant chi-squared test with a phi coefficient of 0.914 indicated a very strong association and confirmed that individuals who perceive personalized advertising as more interesting are substantially more likely to prefer it.

Despite this positive disposition, respondents articulated considerable reservations concerning personalized advertising. 72.03% expressed concerns about data protection and privacy, 69.93% of participants felt monitored by personalized advertising, and 69.23% feared receiving unwanted advertisements. Only 12.59% disagreed with having privacy concerns, and only 8.39% reported not feeling monitored. A correlation analysis revealed a strong positive and statistically significant relationship between privacy concerns and feeling monitored by personalized advertising.

The importance attributed to data protection was high, with 82.52% of participants rating the protection of personal data as important to very important. Similarly, 83.92% of participants rated transparency regarding data usage as important to very important for personalized advertising. These findings highlight a pronounced necessity for clarity and openness concerning the use of personal data.

When directly faced with a choice, the majority of respondents (72.03%) selected personalized advertising over standardized advertising, despite their privacy concerns. This suggests that

privacy concerns, while significant, do not override the general preference for personalized advertising. This specific finding supports the existence of the Privacy Paradox.

### 3.2.2 Testing the Hypotheses

The model presented in Figure 1 is tested in two steps. First the different links are considered individually before a PLS-SEM estimation is conducted to evaluate the model as a whole.

The survey examined trust in relation to established brands versus potentially less trustworthy, inexpensive foreign online shops. Trust in established brands, such as Apple (88.81%), regarding personal data protection was significantly higher than trust in shops like Temu (19.58%).

The relationship between trust and acceptance, however, is more nuanced:

1. Apple: A U-test reported no significant correlation between trust in Apple and the willingness to accept personalized advertising from the brand ( $p = 0.665$ ,  $U = 372.5$ ). This suggests that for highly established brands, baseline trust is not a decisive factor in accepting personalized advertising.
2. Temu: In contrast, the test indicated a significant negative correlation between mistrust toward Temu and the rejection of its personalized advertising. Individuals who displayed less trust in Temu were significantly more likely to reject its personalized advertising.

These results suggest that, while high trust in an established brand does not significantly increase acceptance of HP, mistrust toward a less established brand significantly decreases acceptance. Consequently, the hypothesis that a high degree of trust positively influences acceptance of HP was not fully confirmed.

The survey demonstrated significant variations in the perception of personalized advertising based on product category. Participants found personalized advertising most helpful in the categories of clothing & accessories (70.63%), followed by streaming services and electronics. Conversely, personalized advertising in sensitive areas, such as financial services (83.22%) and health & care (64.34%), was most frequently perceived as unpleasant or intrusive.

A t-test for paired samples confirmed a statistically significant difference ( $p < 0.001$ ,  $d = 0.355$ ) in perception between sensitive and non-sensitive categories. Participants perceived personalized advertising for health products, e.g., medication, as significantly more critical and invasive (mean 4.06) compared to everyday products, e.g., food (mean 3.60).

Acceptance was further evaluated using three specific scenarios.

1. Advertising for coffee mugs after purchasing a coffee machine
2. Advertising for medication based on the last pharmacy purchase
3. Personalized advertising for special credit cards based on recent bank transactions

The comparative analysis showed statistically significant differences in acceptance across the three scenarios. Acceptance was significantly higher for everyday items, i.e., coffee mugs (mean 3.47,  $p < 0.001$ ), than for financial products (mean 2.02,  $p < 0.001$ ) or medication (mean 1.55,  $p < 0.001$ ), confirming the hypothesis that the product category influences the perception of personalized advertising, with content in sensitive areas being viewed more critically.

The survey investigated both the willingness and the actual behavior of participants regarding purchases prompted by personalized advertising. A substantial majority (56.64%) indicated a willingness to imagine purchasing a product suggested through personalization; only 2.8% completely rejected the idea.

Regarding actual behavior, 73.43% reported having purchased a product at least once after being alerted to it by personalized advertising, underscoring the efficacy of such measures. A correlation analysis demonstrated a strong positive and statistically significant relationship between the willingness to purchase and the actual purchasing behavior ( $r = 0.684$ ;  $p < 0.001$ ). These results confirmed the hypothesis that HP has a significant influence on consumer purchasing behavior.

The study also assessed the influence of HP on customer satisfaction. Satisfaction levels varied across three personalized marketing scenarios:

1. Personalized Emails with Discount Codes
2. Personalized Product Recommendations on a Website (based on past purchases)
3. Personalized Advertising in Social Media (for a recently viewed product)

A t-test revealed no significant and only rather weak differences in satisfaction ( $p = 0.076$ ,  $d = 0.149$ ) between personalized emails (mean 3.61) and website product recommendations (mean 3.45). However, there was a statistically significant moderate difference ( $p < 0.001$ ,  $d = 0.719$  and  $p < 0.001$ ,  $d = 0.705$ ) in satisfaction between these two methods and personalized advertising in social media (mean 2.77), indicating that the medium of personalization significantly affects satisfaction. Personalized emails and website recommendations were generally preferred over social media advertising.

A substantial portion (37.76%) were neutral regarding the statement that personalized advertising makes them feel understood by the brand (mean 2.77), suggesting HP alone may be insufficient to generate this feeling. The majority were also neutral regarding the statement that personalized offers lead them to prefer one online shop. There was a slightly positive sentiment (mean 3.14) regarding the statement that personalized offers encourage repurchasing from an online shop. None of these differences were significant and at most of weak strength.

The findings imply that while HP can positively influence satisfaction, success is highly dependent on the type and context of personalization. The inability to fully confirm the hypothesis that HP generally leads to increased company satisfaction suggests that further measures may be necessary to sustainably enhance customer loyalty.

The analysis investigated whether demographic factors, i.e., age and gender, exerted a differential impact on the effectiveness of HP. Age was segmented into two groups: younger (under 35) and older participants.

A chi-squared test indicated a significant ( $p = 0.004$ ,  $\phi = -0.238$ ) association between age and preferred advertising type. Younger individuals demonstrated a stronger tendency to prefer personalized advertising, while older individuals were slightly more inclined toward general, non-personalized advertising.

Gender also showed a statistically significant ( $p < 0.001$ ,  $\phi = -0.278$ ) association with advertising preference. An overwhelming majority of male participants preferred personalized advertising, a trend that was less pronounced among female participants. The size of the phi coefficient indicated a weak-to-moderate effect, suggesting men have a stronger preference for personalized advertising than women.

Furthermore, a Mann-Whitney U-test showed a significant difference ( $p = 0.004$ ,  $U = 1058.5$ ) between age groups regarding actual purchases due to personalized advertising. Younger participants were found to have purchased products more frequently as a result of personalized advertising. In contrast, gender demonstrated no significant influence on actual purchasing behavior ( $p = 0.108$ ,  $U = 1406$ ) due to personalized advertising.

These results collectively led to the rejection of the hypothesis that demographic characteristics have no significant influence on the effectiveness of HP, highlighting that age, in particular, exerts a relevant influence.

Considering the full model, a PLS estimation of the underlying model is deemed the most consistent choice since multiple variate relations persist throughout the model and the PLS estimation accounts for corresponding moderating and mediating effects. In addition to the model as displayed in Figure 1, both gender and age have been added as control variables to account for potential biases in the sample, as discussed above. Estimation was carried out using the *semirn* package in 4.4.3.

As indicated above, three constructs are multi-item constructs, and Table 2 below summarizes standard measures of reliability and validity, indicating that in all three cases the measures exceed the corresponding critical thresholds.

Table 2. Reliability and Validity Measures

Variable	Cronbach's Alpha	Rho A	Rho C	Average
Emotions positive	0.849	0.858	0.930	0.868
Emotions negative	0.727	0.826	0.875	0.779
Satisfaction	0.795	0.801	0.880	0.710

Figure 2 summarizes both the relations in the model significant at the 5% level and for each of the subsequent constructs, the coefficient of determination. To detail all potential relations, Table 3 summarizes as well for all possible relations the coefficients, standard errors in brackets, and significance levels indicated via asterisks. Effects by gender are not explicitly reported and neither are the effects of age.

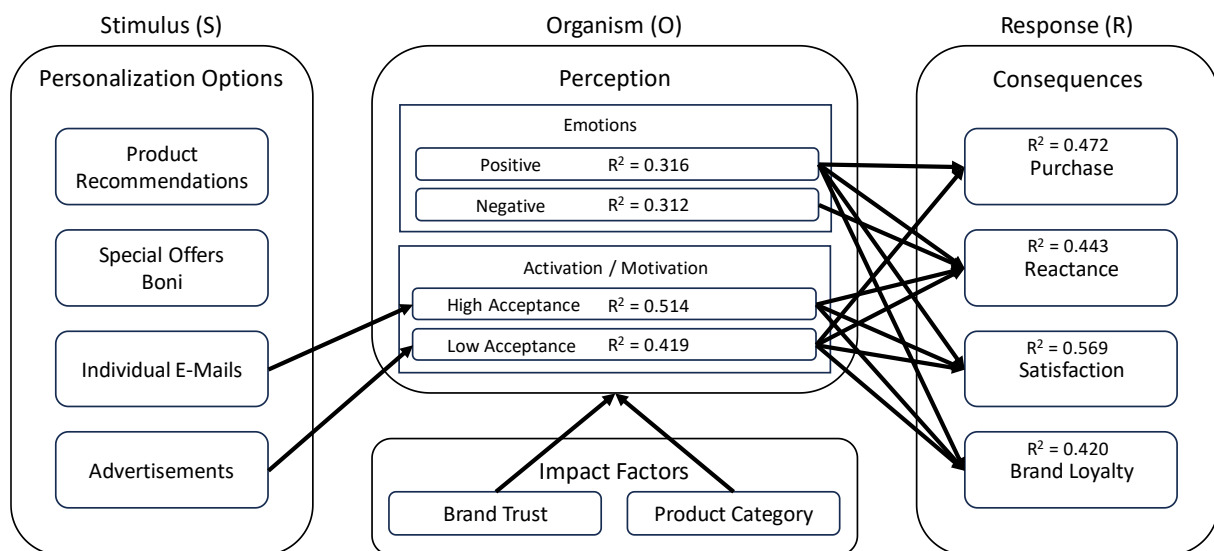


Figure 2. Significant Relations

Table 3. Equation Coefficients

Relation	Coefficient	Relation	Coefficient
PR-EMO Pos	-0.056 (0.062)	PC3-EMO Pos	0.006 (0.086)

<b>Relation</b>	<b>Coefficient</b>	<b>Relation</b>	<b>Coefficient</b>
PR-EMO Neg	-0.041 (0.068)	PC3-EMO Neg	-0.264** (0.095)
PR-ACT High	0.022 (0.043)	PC3-ACT High	0.123** (0.082)
PR-ACT Low	0.076 (0.076)	PC3-ACT Low	0.165** (0.074)
SOB-EMO Pos	0.007 (0.085)	PC4-EMO Pos	-0.234** (0.085)
SOB-EMO Neg	-0.083 (0.071)	PC4-EMO Neg	0.301*** (0.082)
SOB-ACT High	0.000 (0.079)	PC4-ACT High	-0.009 (0.064)
SOB-ACT Low	0.012 (0.076)	PC4-ACT Low	-0.141 (0.085)
IE-EMO Pos	0.027 (0.074)	PC5-EMO Pos	0.060 (0.090)
IE-EMO Neg	-0.009 (0.071)	PC5-EMO Neg	-0.071 (0.108)
IE-ACT High	-0.138* (0.072)	PC5-ACT High	0.153** (0.070)
IE-ACT Low	0.016 (0.074)	PC5-ACT Low	0.160** (0.075)
ADV-EMO Pos	0.054 (0.117)	EMO Pos-PUR	0.300** (0.097)
ADV-EMO Neg	-0.104 (0.074)	EMO Neg-PUR	0.009 (0.089)
ADV-ACT High	-0.005 (0.060)	ACT High-PUR	-0.032 (0.071)
ADV-ACT Low	0.224** (0.095)	ACT Low-PUR	0.445*** (0.088)
BT-EMO Pos	0.318*** (0.092)	EMO Pos-REACT	0.271** (0.082)
BT-EMO Neg	-0.137 (0.093)	EMO Neg-REACT	-0.108* (0.064)
BT-ACT High	0.599*** (0.077)	ACT High-REACT	0.345*** (0.075)
BT-ACT Low	0.062 (0.076)	ACT Low-REACT	0.159** (0.073)
PC1-EMO Pos	0.112 (0.112)	EMO Pos-SAT	0.260** (0.093)
PC1-EMO Neg	-0.204** (0.098)	EMO Neg-SAT	-0.097 (0.065)
PC1-ACT High	0.152* (0.078)	ACT High-SAT	0.231*** (0.064)

Relation	Coefficient	Relation	Coefficient
PC1-ACT Low	0.235** (0.081)	ACT Low-SAT	0.295*** (0.075)
PC2-EMO Pos	-0.004 (0.084)	EMO Pos-BL	0.388*** (0.082)
PC2-EMO Neg	0.210* (0.114)	EMO Neg-BL	-0.002 (0.067)
PC2-ACT High	-0.078 (0.094)	ACT High-BL	0.237*** (0.068)
PC2-ACT Low	-0.015 (0.089)	ACT Low-BL	0.223** (0.079)

\* indicates a significance level of 10%, \*\* indicates a significance level of 5% and \*\*\* indicates a significance level of 1%.

While the effects of gender and age are not reported, it can be stated that gender only reports a significant effect on the negative emotional perception, and age only reports significantly negative effects on positive emotional perceptions and low activation as well as satisfaction. Thus, it can be assumed that any biases resulting from the sample composition are marginal.

Since all the subsequent constructs report  $R^2$  statistics larger than 0.3, not only does this act to show the overall quality and fitting structure of the model, but it also suggests that all constructs are well chosen in the study context.

The results further indicate that the different types of HP do not elicit emotional effects in the participants. The missing significance of product recommendations and special individual offers indicates that these types of personalization have already become standard processes that no longer elicit consumer reactions. Individualized e-mails and advertisements, while reporting significant effects, show that they are perceived rather negatively and, in sum, lead to lower activation.

The strong and highly significant effects of the product category provide added strength that personalization endeavors need to be carefully curated regarding the specific business segments they are supposed to be implemented in.

Finally, all four response dimensions report very high  $R^2$  statistics and are strongly impacted by the preliminary constructs. Combined with the previous statement, this indicates that HP plays a critical role throughout.

#### 4. Discussion

The findings from the empirical consumer survey and the qualitative expert interviews can be synthesized into an evaluation of the six hypotheses, thereby positioning the study's results within the model framework.

The first hypothesis (H1a), which posited that consumers exhibit a more positive attitude toward personalized marketing strategies compared to standardized advertising, was individually confirmed by the quantitative data. The majority of respondents demonstrated a clear preference for personalized advertising, specifically citing the perceived relevance of the offers as a decisive advantage. This finding is consistent with established literature, which suggests personalized advertising is perceived as more relevant and useful because it aligns more closely with consumers' individual interests and needs. Experts in the qualitative study supported this, emphasizing that personalized advertising is seen as highly advantageous when

it is relevant and provides a direct utility or added value to the consumer (Bleier & Eisenbeiss, 2015; Desai, 2016). Consequently, it is critical to observe the results of the SEM estimation that indicate that these insights do not hold uniformly across all types of HP. Thus, the hypothesis can only to a certain degree be accepted.

It can be noted additionally that, despite the pervasive concerns regarding data protection and privacy articulated in the survey, most participants still chose personalized over standardized advertising. This behavioral pattern aligns with the Privacy Paradox. The non-significant statistical relationship between the importance of data protection and the preference for personalized advertising further substantiated this paradox (Aguirre et al., 2016).

The second hypothesis (H1b), that a high degree of trust in a company positively influences the acceptance of HP, revealed a discrepancy with some previous academic findings. While literature often emphasizes brand trust as central to the acceptance of personalized marketing measures (Bleier & Eisenbeiss, 2015; Kim et al., 2019), the present study demonstrated a nuanced outcome. Specifically, trust in highly established brands, such as Apple, exhibited no statistically significant influence on the acceptance of their personalized advertising. Conversely, low trust in less established brands, such as Temu, was significantly correlated with the rejection of their personalized advertising. This suggests that while mistrust severely diminishes acceptance, high baseline trust in an established brand may function as a baseline condition and not an additional factor promoting HP acceptance. Expert opinions were mixed, with some emphasizing the criticality of trust and others viewing it as less decisive. Results from the SEM estimation seem to favor the position that brand trust will be a utilizer for a more positive perception of and a more activating role of HP. Consequently, the hypothesis can rather be accepted as well.

The third hypothesis (H1c), which proposed that the product category influences the perception of personalized advertising, with content in sensitive areas being viewed more critically, was unequivocally confirmed by the quantitative findings, both individually and in the SEM estimation. Participants expressed a significantly more critical stance toward personalized advertising in sensitive categories, such as financial services and health & care, compared to non-sensitive areas like clothing and entertainment. This result aligns with literature indicating that personalized content concerning private or personal topics is perceived as invasive and potentially threatening (Bhushan, 2018; Kaptein & Parvinen, 2015). The qualitative expert interviews uniformly supported this conclusion, emphasizing that HP in sensitive areas necessitates a cautious approach to avoid the perception of surveillance or unwanted influence. These results highlight the need for companies to potentially reduce the degree of personalization in sensitive product categories to maintain consumer trust and increase acceptance. The hypothesis could therefore be unanimously accepted.

The fourth hypothesis (H2a), stating that HP has a significant influence on consumer purchasing behavior (Desai, 2016; Raji et al., 2024), was clearly validated by the empirical data. A substantial majority of respondents reported having purchased a product at least once due to being alerted to it by personalized advertising. The statistical analysis confirmed a strong, positive correlation between the willingness to purchase and the actual purchasing behavior. This finding supports the existing literature, which confirms that personalized recommendations and targeted advertising significantly influence consumers' purchase decisions and can notably increase e-commerce conversion rates. These results are also almost unanimously confirmed by the SEM estimation. Experts concurred, attributing observed revenue uplifts to the higher relevance of personalized offers, which streamline purchasing decisions for customers. Consequently, the hypothesis can be accepted.

The fifth hypothesis (H2b), predicting that personalized marketing measures lead to increased customer satisfaction with the company, could not be fully substantiated. The results demonstrated that satisfaction is highly dependent on the type and context of the personalization. While personalized emails and website product recommendations were generally perceived positively, personalized advertising delivered through social media received significantly less positive feedback. This divergence suggests that the success of HP strategies is highly context-dependent, indicating that the medium of personalization significantly influences satisfaction (de Keyser et al., 2015; Grandhi et al., 2021; Li & Wang, 2013). The results from the SEM estimation, where customer satisfaction is considered as an aggregate construct, however, report a strong and significant relation. However, this outcome challenges the notion that the mere deployment of HP is sufficient to enhance customer satisfaction sustainably, suggesting that other measures are necessary to strengthen customer loyalty. The hypothesis, therefore, can only partially be accepted.

Finally, the sixth hypothesis (H2c), which claimed that demographic characteristics exert no significant difference in the effectiveness of personalized measures (Bleier & Eisenbeiss, 2015; Lee & Kwon, 2008), was rejected. The empirical data revealed significant differences in advertising preference and purchasing influence based on age and gender. Younger participants demonstrated a stronger preference for personalized advertising and reported higher rates of purchases resulting from it compared to older participants. This finding contrasts with some existing literature that posits personalization's effectiveness is largely independent of demographic factors. The disagreement among experts further highlighted this complexity: while some experts saw no significant demographic effect, others reported that age, in particular, influences the acceptance and effectiveness of HP, with younger consumers being more open to it. These results underscore the critical need for companies to segment their strategies and adapt their approach to the demographic characteristics of their target groups. These arguments are somewhat dampened by the low relevance that gender and age play in the context of the estimated SEM. Thus, the hypothesis can mostly be rejected, but the issue still requires a more nuanced consideration in future studies.

## 5. Conclusions

### 5.1. Recommendations for Practitioners

The concluding chapter synthesizes the research findings to derive practical recommendations for the e-commerce sector and delineates the study's methodological limitations alongside directions for future research.

Based on the evidence accrued in this study, several strategic recommendations for e-commerce organizations can be formulated. The research decisively indicates that companies operating in the e-commerce domain must invest in the development and implementation of AI-based personalization solutions. Despite the finding that consumer concerns regarding data protection and privacy did not exert a statistically significant influence on the acceptance of personalized advertising in this study, organizations must treat these concerns seriously. It is imperative to achieve a necessary balance between the delivery of relevant, personalized content and the protection of customer privacy. Only through this equilibrium can HP attain its full potential without compromising consumer trust.

The responsible management of data and the rigorous safeguarding of customer privacy are paramount to preventing negative consequences. Companies must meticulously analyze the specific expectations and concerns of their target demographics and adapt their personalization strategies accordingly to generate positive effects. Concurrently, organizations must diligently

control the degree of personalization to ensure customers do not experience feelings of surveillance or discomfort. Excessive personalization can be counterproductive, potentially leading to negative customer reactions. Therefore, developing algorithms that respect the customer's personal space while simultaneously delivering relevant content is critical.

A key empirical finding demonstrated that the perception of personalized advertising varies substantially depending on the product category. Consequently, companies should proceed with caution, particularly in sensitive sectors, to ensure that personalization is not perceived as invasive. In less sensitive categories, such as clothing or entertainment, personalized recommendations can be deployed more overtly and directly.

Furthermore, the research specifically highlighted that demographic characteristics, particularly age, exert a relevant influence on the effectiveness of HP. This necessitates that companies segment their marketing strategies more intensely and tailor them to the specific needs and preferences of the respective age groups. Younger consumers, who tend to be more tech-savvy, may be receptive to more open and intensive personalization, whereas a more cautious approach may be advisable for older or less technologically adept target groups.

It is essential for companies to maintain transparent communication and strictly adhere to data protection regulations to strengthen customer trust. Communication regarding the use of customer data must be enhanced, clearly explaining how the data is utilized for HP. Transparent data protection guidelines and user-friendly mechanisms for data control and deletion can further reinforce customer confidence. Although high brand trust is not the sole determinant for the acceptance of personalized advertising, low trust can be significantly detrimental. Therefore, continuous investment in building and maintaining brand trust—through credible, transparent, and customer-centric actions—is paramount.

Overall, the future of HP lies in increasingly precise and efficient measures. Companies must continuously refine and adapt their personalization strategies, particularly in light of new technologies, to secure a competitive advantage while delivering added value to customers. Businesses that successfully navigate the complex balance between HP and data protection will achieve successful market positioning in an increasingly competitive environment. By implementing these recommendations, companies can optimally leverage the benefits of HP, solidify customer trust, and establish long-term, loyal customer relationships.

## 5.2. Limitations and Outlook

The study provides valuable insights into the effects and perceptions of HP in e-commerce, but it is important to acknowledge certain potential limitations that may affect the generalizability and conclusive nature of the results. These limitations stem from methodological decisions and external factors that influenced the research design and data collection.

The investigation was based on a limited number of expert interviews, predominantly featuring experts from the same industry, which may constrain the transferability of the qualitative findings to broader contexts. Subjective opinions among experts might have influenced the interpretation of results, potentially leading to an incomplete representation of all relevant perspectives.

The sample size of the consumer survey also presents potential limitations. The number of respondents may not be sufficiently representative of the entire e-commerce market target group, as certain demographic groups may be underrepresented, thus restricting the generalizability of the findings. This aspect holds particularly since the sample does not perfectly align with the German population, which needs to be considered the relevant population. Specifically, the age distribution suggests the results mainly reflect the views of

younger and middle-aged individuals, with older persons and adolescents being less represented. The sample also skewed toward high educational attainment, which could influence the perception and acceptance of personalized advertising. While arguments have been raised that relativize the bias resulting from both aspects, and age and gender are controlled for in this study, a future study should aim at a more representative sample. Even if such a sample would not contain the same understanding of personalization technologies, it would much better reflect the actual situation in online shopping.

Furthermore, a limited sample size complicates the identification of statistically significant differences or correlations. Considering the sampling process and the voluntary participation, individuals with a vested interest in HP or marketing may have been disproportionately represented, potentially biasing the results. Future studies requiring more comprehensive and generally applicable conclusions necessitate a larger and more diverse sample.

The study focused on specific forms of HP (e.g., personalized emails, social media advertising) and did not comprehensively address all possible personalized marketing measures, which represents another limitation. Furthermore, the potential for recall bias among participants is a factor, as they might have difficulty accurately recalling past experiences with personalized advertising, potentially impairing data accuracy. Participants might also have unconsciously made purchases based on personalized measures without realizing it. It must also be considered that this study provides only a snapshot of consumer attitudes and behaviors, which are subject to change over time. Long-term trends and market changes were not captured, potentially restricting the transferability of results to future developments.

Future research should focus on optimizing HP through the application of advanced AI algorithms, specifically investigating how new technologies can create more precise and context-aware personalization strategies. With the increasing adoption of technologies like augmented reality and virtual reality, research could explore how HP can be effectively integrated into these new digital environments and the resulting impact on consumer behavior. Further investigation is warranted into how AI can enhance the accuracy and effectiveness of personalization strategies, and the accompanying ethical and legal challenges.

Given that the current study provides only a snapshot of customer perception, future research should concentrate on the long-term effects of HP on customer retention and loyalty, examining whether positive effects persist over time or if wear-out occurs. Deeper analysis of the privacy paradox within the specific context of German consumers is also needed, particularly examining how consumers weigh the risks and benefits of HP and the factors influencing their decisions. Such understanding can aid in developing strategies that minimize the conflict between privacy concerns and HP acceptance. Further studies should also focus on how different demographic groups react to HP to inform the development of more targeted and effective personalization strategies. Finally, continued research into the ethical implications and regulatory necessity of HP is crucial, focusing on how companies can responsibly manage personal data while maximizing the value of personalized content. This aspect increases in relevance with the first approaches to base personalized offers on genetical particularities of customers (Anestis & Nilsson, 2025).

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## Appendix

### Interview Guide (German original and English translation)

1. Stimmen Sie der Erhebung und wissenschaftlichen Auswertung dieses Interviews zu?  
(Do you consent to the recording and scientific evaluation of this interview?)
2. Wie bewerten Sie die allgemeine Bedeutung von Hyperpersonalisierung im E-Commerce?  
(How would you evaluate the relevance of hyper personalization for e-commerce?)
3. Welche Vorteile sehen Sie in der Anwendung von Hyperpersonalisierung für Unternehmen und Kunden?  
(Which advantages for companies and customers do you perceive considering the implementation of hyperpersonalization?)
4. Welche Technologien und Tools werden in Ihrem Unternehmen zur Umsetzung von Hyperpersonalisierung eingesetzt?  
(Which technologies and tools are used in your company to realize hyperpersonalization?)
5. Inwiefern hat künstliche Intelligenz bereits den Einsatz von Hyperpersonalisierung beeinflusst?  
(In how far did artificial intelligence influence the use of hyperpersonalization?)
6. Welche Strategien verfolgen Sie, um Hyperpersonalisierung in Ihrer Marketingstrategie zu integrieren?  
(Which strategies do you follow by integrating hyperpersonalization into your marketing strategy?)
7. Welche Arten von Daten sammeln Sie zur Personalisierung und wie werden diese Daten genutzt?  
(Which types of data do you collect with the aim of personalization and how are these data being processed?)
8. Wie stellen Sie sicher, dass die Datenschutzbestimmungen eingehalten werden und die Daten sicher verwaltet werden?  
(How do you make sure that data privacy regulations are observed and data is stored safely and securely?)
9. Wie reagieren Ihre Kunden auf personalisierte Angebote und Inhalte?  
(How do your customers react to personalized offers and content?)
10. Welche Auswirkungen hat Hyperpersonalisierung auf die Kundenzufriedenheit?  
(Which consequences does hyperpersonalization have on customer satisfaction?)
11. Hat die Hyperpersonalisierung einen Einfluss auf die Kundenbindung und –loyalität?  
(Did hyperpersonalization have an impact on the customer retention and loyalty?)

12. Welche Herausforderungen begegnen Sie bei der Implementierung von Hyperpersonalisierung?

(Which challenges did you encountered while implementing hyperpersonalization techniques?)

13. Welche Risiken und möglichen negative Auswirkungen sehen Sie bei der Nutzung von Hyperpersonalisierung?

(Which risks and possible negative effects to perceive considering the use of hyperpersonalization?)

14. Wie sehen Sie die zukünftige Entwicklung von Hyperpersonalisierung im E-Commerce?

(How do you perceive the future development of hyperpersonalization in e-commerce?)

15. Welche neuen Trends und Innovationen erwarten Sie im Bereich der Hyperpersonalisierung?

(Which new trends and innovations do you expect regarding hyperpersonalization?)

16. Gibt es noch weitere Aspekte des Themas Hyperpersonalisierung, die Ihrer Meinung nach angesprochen werden sollten?

(Do other aspects regarding the topic of hyperpersonalization remain that according to you opinion need to be addressed?)

Questionnaire (German original and English translation)

1. Wie viele Stunden pro Tag nutzen Sie das Internet für private Zwecke?

(How many hours do you use the internet for private purposes?)

2. Wie häufig nutzen Sie das Internet für den Einkauf von Produkten oder Dienstleistungen?

(How often do you use the internet to shop for products or services?)

3. Können Sie sich an eine Situation erinnern, in der Sie personalisierte Werbung erhalten haben?

(Can you recall a situation where you received personalized advertising?)

4. Welche Art von personalisierter Werbung haben Sie schon wahrgenommen?

(Which type of personalized advertising do you remember seeing before?)

5. Welche Vorteile sehen Sie in der Personalisierung von Werbung?

(Which advantages do you perceive personalized advertising to have?)

6. Welche Bedenken haben Sie gegenüber personalisierter Werbung?

(Which reservations do you have with regard to personalized advertising?)

7. Wie wichtig ist Ihnen der Schutz Ihrer persönlichen Daten?

(How important is for you the safety of your personal data?)

8. Wie wichtig ist Ihnen Transparenz bei der Datennutzung für personalisierte Werbung?

(How important is for you transparency of data use regarding personalized advertising?)

9. Wie reagieren Sie, wenn Sie bei dem Besuch einer Website ein Pop-up sehen, das um Ihre Zustimmung zur Verwendung von Cookies bittet?

(How do you react when you visit a website and you see a pop-up that asks for your approval to use cookies?)

10. Sind Ihnen die Konsequenzen und Details bewusst, wenn Sie der Verwendung von Cookies zustimmen?

(Are you aware of the consequences and details of what it implies when you approve the use of cookies?)

11. Welche Art von Daten würden Sie für ein angenehmeres Einkaufserlebnis zur Verfügung stellen?

(Which types of data would you share to have a more convenient shopping experience?)

12. Bevorzugen Sie personalisierte Werbung, die auf Ihre Interessen zugeschnitten ist, gegenüber allgemeiner, nicht-personalisierter Werbung?

(Do you prefer personalized advertising tailored to your interests over general non-personalized advertising?)

13. Wie sehr stimmen Sie der folgenden Aussage zu: "Personalisierte Werbung ist für mich interessanter als allgemeine Werbung."

(How strongly do you agree with the statement "Personalized advertising is more interesting for me than general advertising.")

14. Wie sehr stimmen Sie der folgenden Aussage zu: "Ich mache mir Sorgen um meine Privatsphäre bei personalisierter Werbung."

(How strongly do you agree with the statement "I am afraid about my privacy regarding personalized advertising. ")

15. Wie sehr stimmen Sie der folgenden Aussage zu: "Ich fühle mich durch personalisierte Werbung manchmal überwacht."

(How strongly do you agree with the statement "Personalized advertising gives me a feeling of being watched.")

16. Schauen Sie sich die folgenden zwei Beispiele von Marketingmaßnahmen an. Welche nehmen Sie positiver auf?

(Consider the following two ads. Which of the two do you perceive more positively?)

17. Wie sehr stimmen Sie der folgenden Aussage zu: "Wenn ich einem Unternehmen vertraue, bin ich eher bereit, personalisierte Werbung zu akzeptieren."

(How strongly do you agree with the statement "If I trust a company I am more open to accept personalized advertising. ")

18. Wie sehr vertrauen Sie bekannten Websites von etablierten Marken wie Apple in Bezug auf den Schutz Ihrer persönlichen Daten?

(How strongly do you trust the websites of established brands like Apple regarding the safety of your data?)

19. Wie sehr vertrauen Sie ausländischen Online-Shops, die Produkte zu sehr günstigen Preisen verkaufen, wie Temu in Bezug auf den Schutz Ihrer persönlichen Daten?

(How strongly do you trust the websites of foreign web shops that offer products for cheap prices, such as Temu, regarding the safety of your data?)

20. Schauen Sie sich die folgenden zwei Beispiele von Marketingmaßnahmen an. Bei welcher Marke sind Sie eher bereit, personalisierte Werbung zu akzeptieren?

(Consider the following two examples of ads. From which of the two brands would you rather be willing to accept personalized advertising?)

21. Wie sehr stimmen Sie der folgenden Aussage zu: "Wenn ich bereits positive Erfahrungen mit einer Marke gesammelt habe, bin ich eher bereit, personalisierte Werbung zu akzeptieren."

(How strongly do you agree with the statement "If I already have positive experiences with a brand I am more open to receive personalized advertising.")

22. In welchen Produktkategorien empfinden Sie personalisierte Werbung als hilfreich?

(In which product categories do you perceive personalized advertising to be helpful?)

23. In welchen Produktkategorien empfinden Sie personalisierte Werbung als unangenehm oder aufdringlich?

(In which product categories do you perceive personalized advertising to be uncomfortable and intrusive?)

24. Ihnen werden nun 3 verschiedene Szenarien vorgestellt. Bitte bewerten Sie, wie akzeptabel Sie personalisierte Werbung in diesen Beispielen empfinden.

Szenario 1: Sie erhalten Werbung für Tassen, basierend auf Ihrem letzten Kauf einer Kaffeemaschine.

Szenario 2: Sie erhalten Werbung für bestimmte Medikamente, basierend auf Ihrem letzten Apotheken-Einkauf.

Szenario 3: Sie erhalten Werbung für eine spezielle Kreditkarte, basierend auf Ihren letzten Banktransaktionen.

(You will now see three different scenarios. Please rate how acceptable you perceive personalized advertising to be in these cases.

Scenario 1: You receive advertising for cups based on your previous purchase of a coffee maker.

Scenario 2: You receive advertising for particular medication based on a previous purchase in a pharmacy.

Scenario 3: You receive advertising for a particular credit card based on your last banking transactions.)

25. Wie stark stimmen Sie den folgenden Aussagen zu: "Personalisierte Werbung für Gesundheitsprodukte (z.B. Medikamente) empfinde ich als kritisch und invasiv."

(How strongly do you agree with the statement "Personalized advertising for health products (e.g., medication) I perceive as critical and invasive.")

26. Wie stark stimmen Sie den folgenden Aussagen zu: "Ich finde personalisierte Werbung für Alltagsprodukte (z.B. Lebensmittel) weniger problematisch."

(How strongly do you agree with the statement "I perceive personalized advertising for everyday products (e.g., food products) less problematic.")

27. Können Sie sich vorstellen, ein Produkt zu kaufen, das Ihnen aufgrund von Personalisierung vorgeschlagen wird?

(Could you imagine buying a product that has been recommended to you as a personalized offer?)

28. Sind Sie schon einmal durch personalisierte Werbung auf ein Produkt aufmerksam geworden und haben es dann gekauft?

(Did the situation ever come up that you became aware of a product because of personalized advertising and later purchased that product?)

29. Ihnen werden nun 3 verschiedene Szenarien vorgestellt. Bitte bewerten Sie, wie zufrieden Sie mit dem Unternehmen wären, das diese personalisierten Marketingmaßnahmen anwendet.

Szenario 1: Ein Unternehmen sendet Ihnen eine personalisierte E-Mail mit einem Rabattcode für ein Produkt, das Sie kürzlich angesehen haben.

Szenario 2: Ein Unternehmen zeigt Ihnen auf der Webseite personalisierte Produktempfehlungen basierend auf Ihren früheren Einkäufen.

Szenario 3: Ein Unternehmen spielt Ihnen auf Social Media eine Werbung für ein Produkt aus, das Sie kürzlich angeschaut haben.

(You will now see three different scenarios. Please rate how satisfied you would be with the company that offers these personalized marketing measures.

Scenario 1: A company sends you a personalized e-mail with a discount voucher for a product that you recently checked out.

Scenario 2: A company displays on their website personalized product recommendations based on your previous purchases.

Scenario 3: A company displays on social media an ad for a product that you checked out recently.)

30. Wie sehr stimmen Sie der folgenden Aussage zu: "Personalisierte Werbung gibt mir das Gefühl, von der Marke verstanden zu werden."

(How strongly do you agree with the statement "Personalized advertising gives me the feeling of being understood by the brand.")

31. Wie sehr stimmen Sie der folgenden Aussage zu: "Wenn mein Online-Shop mir personalisierte Angebote bietet, kaufe ich dort lieber ein."

(How strongly do you agree with the statement "If an online shop provides personalized offers, I prefer shopping there.")

32. Wie sehr stimmen Sie der folgenden Aussage zu: "Wenn mein Online-Shop mir personalisierte Angebote bietet, würde ich eher wieder dort kaufen."

(How strongly do you agree with the statement "If an online shop provides personalized offers, I would prefer to shop there repeatedly.")

33. Was ist Ihr Geschlecht?

(What is your gender?)

34. Wie alt sind Sie?

(How old are you?)

35. Welchen Bildungsabschluss haben Sie?

(What is your highest educational achievement?)