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# Live-Stream Shopping is Landing in Germany: An Analysis of the Stickiness Intention of German Customers

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**Abstract.** Live-stream shopping (LSS) has emerged as a highly profitable social commerce phenomenon that revolutionizes the retail industry in recent years. Especially COVID-19 reinforces this trend. However, research in LSS is still in its infancy. The current study sheds new light onto live-stream shopping in Europe, particularly Germany, as a first study. It analyzes the perceived value and the communication process between the retailer and the customer. Particularly the communication process has not been investigated in this context before so that new theoretical and empirical insights are provided. The results show that German customers' stickiness is more driven by the functional than the hedonic value. Moreover, the influence of retailers' social presence differs among younger and older customers.

**Keywords:** live streaming, stickiness intention, shopping value, computer-mediated communication interactivity model

## 1 Introduction

Live-stream shopping (LSS) is the next frontier of e-commerce and promises to revolutionize the retail industry and customer shopping habits [1], [2]. Moreover, LSS is a relatively new phenomenon with which retailers can introduce and showcase products, engage with customers in real-time and allow customers to purchase products without leaving the session [2], [3]. Especially in China, LSS has become one of the most popular forms of social commerce (s-commerce) since 2015 [4]. The outbreak of COVID-19 positively influenced this trend and led to a market size increase from 433 billion Yuan in 2019 to 991 billion Yuan with 20 million sold products via live stream platforms in 2020 [5-7]. The outbreak of COVID-19 also drives the interest of European customers and the offering of LSS events by retailers. For instance, the share of retail brands (mostly domiciled in the fashion & beauty industry) offering LSS events increased from 3% in Q4 in 2019 to 28% in Q4 2020 [2], [7]. In contrast, only 4% of all German customers and only 5% of the young customers between 18 and 29 years used LSS. Moreover, 67% of German customers do not know that LSS exists [8]. A possible explanation may be the low offering of live-stream retailers. Only a few small retailers and retail chains (e.g., Douglas, Tchibo, Tamaris) or platforms (e.g., livebuy, Ritzi)

started with the new service [9-13]. Mainly fashion and cosmetic products are the top categories that draw (predominantly female) customers' attention in Germany [7], [8]. However, the different shopping behavior of German customers in comparison to other European countries is astonishing. For retailers, it is crucial to know the reasons as LSS provides them with a cost-effective channel, reducing the marketing cost and increasing the add-to-cart and conversion rate [7].

Research on LSS, which is usually characterized as a form of s-commerce with special media attributes [14], [15], is nascent. Hence, this study contributes to the s-commerce and live-stream literature as follow. Emerging from Asian countries, western countries are mostly not present in current LSS studies [15], [16]. First of all, this paper addresses this research gap. Secondly, it takes a new perspective on the analysis of LSS that does not aim at explaining what drives customers to use but what makes them to stick with LSS (see next section). Not only but particularly for inexperienced retailers, it is essential to know what keeps the customer in the live-stream as this increases the buying opportunity [17], [18].

Thirdly, interactivity plays a crucial role in s-commerce but lacks a consistent understanding and operationalization [6], [19], [20], [21]. It is usually used as a general antecedent of the usage behavior without specifying its dimensions. This paper investigates the impact of different dimensions of interactivity on stickiness in more detail. Fourthly, people's behavior usually is not uniform among different groups. For example, young people have other preferences and are more prone to new technology than older people. Interestingly, in Germany there is low usage of LSS in all age groups. The question is if the inhibiting factors are the same or differ among the groups. Also the underlying technology (e.g. PC/Laptop vs. smartphone) may impact the usage behavior, in particular as LSS is said to be a mobile technology [2], [7]. Hence, this paper takes these influencing factors into account and distinguishes between these differentiators addressing another research gap of the LSS literature [6], [16].

In sum, the following research questions shall be answered:

*RQ1: What are the antecedents of customers' stickiness intention of LSS?*

*RQ2: How do the different dimensions of interactivity affect customers' stickiness intention of LSS?*

*RQ3: How do the customers' devices and other group differentiators affect customers' stickiness intention of LSS?*

## **2 Literature Review**

China is the biggest LSS market. Therefore it is not surprising that the majority of studies are based in China, respectively Asia. Only Cai et al. [3] investigated LSS in the United States. None of the existing studies investigated LSS in Europe or Germany, respectively. Former studies have explored how various drivers and motivational aspects [3], [4] as well as the role of the presenting celebrity and the presented content [22] exert an impact on customer engagement [14], [15], [23], [24] customer loyalty [25], purchase intention [6], [16], [21], [26] and how LSS influences sale and product

recommendation [1]. However, none of them investigated stickiness intention and therefore cannot explain what keeps the customer in the live streaming session.

Only two out of ten studies considered the communication in their research model but focused only on the retailer's perspective with personalization and responsiveness [15] or general aspects of interactivity [6]. No paper considered further dimensions like two-way communication or synchronicity, which are most effective in contributing to the communication in the online context [27]. Lastly, previous research only used group differentiators like age and gender as control variables but did not analyze the impact of these demographics on the model itself [4], [26]. In particular, the customer device used for LSS has not been investigated before.

### **3 Theoretical Framework and Hypotheses Development**

#### **3.1 Stickiness and Perceived Value**

Stickiness has been used in prior research on e-commerce. It is defined as customers' time spent on a company website, a deep-rooted commitment which ensures them of repeated visits and use of that website [28], visit time length [29], or customers' underlying as well as unconscious willingness to revisit the website [30]. Stickiness influences customers' commitment to and trust in the website [31]. When customers stick to a website, this forms a positive attitude towards the content, products, and services and finally increases the purchase intention [17], [18]. Therefore, stickiness is a critical factor for e-commerce websites to create business value [32] and can be considered as a compound of relationship marketing like customer loyalty in a cyber context [18], [33]. We employ the measurement of stickiness used in former studies on e-commerce websites based on different items as a form of time length and user retention [18], [29], [32].

Customer value creation is an essential factor for explaining usage behavior because the consumption activities of customers produce both hedonic and utilitarian (functional) outcomes [18], [34]. An analysis exclusively based on the merit of any goods or services acquired fails to recognize and understand these numerous intangible and emotional costs and benefits [35]. Therefore, former research developed the perceived personal shopping value and brought the so-called dark side and the fun side of shopping together [34], [36]. In the context of social media or live streaming, customers and retailers interact with each other and pay attention to common topics about products and trends. Providing valuable information in this process, would drive customers to stick to the live streaming when they realize that they get more useful information about products and trends [6], [14].

The utilitarian value reflects shopping with a work mentality [37] and can be understood as *"the degree to which a product/service provides the expected utility"* [14, p. 3]. Studies in the field of live-stream and s-commerce found a positive impact of the functional value on the engagement [14], product-related information [3], stickiness intention [32], [18] and intention to purchase [6]. A recent study revealed that German

customers perceived LSS as useful [8]. Therefore, it is likely that the more customers perceive LSS as useful, the more they stick to LSS. Hence, we hypothesize:

*H<sub>1</sub>: The functional value of LSS positively influences customers stickiness intention of LSS.*

In line with former research, the functional value of LSS comprises the aspects that (1) live-stream retailers should try on the clothes to demonstrate what these items look like in order to visualize the “real” size of the product (2), that products sold by live-stream retailers tend to be up-to-date [14], and that (3) LSS is helpful regarding the purchase decision making [6]. Additionally, two new aspects are added: (4) the fast and comprehensive product information as well as (5) the ability of time-saving compared to the visit of a traditional store in the city center.

In contrast to the dark side of shopping, humorous jokes and anecdotes provide a pleasant emotional experience. This makes customers to stick to the retailer in the future for perceived pleasure and happiness [38]. The hedonic value can be characterized as reactional, emotional and experiential benefits of the shopping activity [34]. In the context of s-commerce, previous studies showed that the hedonic value (perceived enjoyment) is an important antecedent for various factors like trust [14], streamer related factors [3], loyalty [25], stickiness intention [18], [32], [39] and the intention to use [6], [22]. Studies in the context of online shopping revealed that the hedonic value results in higher customer attention, which in turn increases the likelihood that the website generates sales transactions [17], [32]. We hypothesize:

*H<sub>2</sub>: The hedonic value of LSS positively influences customers stickiness intention of LSS.*

In line with previous research, the hedonic value comprises aspects of entertaining, adventure, relaxing, thrilling and exciting activities [6], [14], [25].

### **3.2 Computer-Mediated Communication Interactivity Model (CMCIM)**

LSS is a new kind of technology mediated communication between retailers and their customers. The Computer-Mediated Communication Interactivity Model (CMCIM) copes with such mediation in communication processes. In brief, it posits that the interactivity capabilities of a communication technology impact the quality of the communication process which in turn influences the communicators’ satisfaction with the communication. This relationship is negatively moderated by status effects which are driven by social presence [40].

“Social presence is the degree to which a medium facilitates awareness of other people and interpersonal relationships.” [40, p. 166] While it is shown to foster negative status effects in group work, social presence also enables people to feel more intimate in terms of human contact, warmth, and sensitivity with another person [27]. In the s-commerce context, it can shorten the psychological distance between customers and retailers and enhance the sense of psychological intimacy, which urges customers to

stick to the retailer [27], [29]. A high degree of social presence makes it easy for the retailer to build a close relationship with the customer [29]. This in turn positively influences the live streaming purchase intention of customers [6], [26]. In line with former studies, we consider the aspects of sense of human contact, personalness, sociability and human warmth by the retailer during the live-stream session [29]. Hence, we hypothesize:

*H<sub>3</sub>: The social presence of the retailer positively influences customers' stickiness intention of LSS.*

Following CMICM, interactivity is crucial for high-quality communication [27], [41]. It is built by the three sub-dimensions: active control, synchronicity and two-way communication [40]. In the context of LSS, this kind of control is in place as nobody is obliged to interact with the retailer. Hence, we do not incorporate the control construct into the research model. Instead, we address the technological characteristics of computer-mediated communication interactivity: two-way communication and synchronicity. Both dimensions are theoretically grounded in the interpersonal interactivity theory [40]. "Two-way communication refers to the ability for reciprocal communication between companies and users and users and users" [42, p. 55] while synchronicity is "the degree to which users' input into a communication and the response they receive from the communication are simultaneous" [42, p. 55]. Transferred to the LSS, two-way communication enables the retailer to receive instant customer feedback via a chat option. The customers' feedback and the retailer's reaction to the feedback establish a two-way communication between both parties, which help the retailer to gauge the customers' needs effectively [17, 42]. In line with the actual operation of LSS, two-way communication is measured as how retailers provide an opportunity to talk to the customer (e.g., via chat); how retailers ask for effective feedback (e.g., whether the product is being held well in the camera) and to what extent the retailer gives customers the feeling that he is listening to them (e.g. answered the questions in the chat) [6], [14], [15], [20]. Concerning synchronicity, this is reflected by the offered chat and the timely reaction of the retailer to the customer questions. The chat allows customers to initiate a conversation with the retailer on product-related issues [27], and the retailers need to address these questions/reactions (e.g., emojis) immediately. Otherwise, a too-long delay to those questions could negatively influence customers' evaluation of their experience [43]. Therefore, synchronicity is measured by timely responses to customers' questions by the retailer; signaling of retailers that they noticed the customer's question in the chat and by the immediate provision of all the necessary information [20], [27].

The importance of interactivity in shopping-related activities has been highlighted in different studies before [e.g. 41]. In the live-stream context, a positive impact of the general construct interactivity on engagement [15] and intention to use [6] has already been confirmed. The interactivity (i.e. two-way communication and synchronicity) impact the perceived quality of a communication process [40]. In the LSS-context, the outcome of the communication process usually consist of additional information about the product (facts, different views etc.). This adds to the functional value of the

communication and therefore to the function value of LSS (see section 3.1). Hence, we hypothesize:

*H<sub>4</sub>: The interactivity in terms of two-way communication between retailer and customer positively influences the functional value of LSS.*

*H<sub>5</sub>: The interactivity in terms of synchronicity between retailer and customer positively influences the functional value of LSS.*

But the interactivity can also establish a personal communication between retailer and customer during LSS that may be very entertaining (humorous jokes, anecdotes). This affects the hedonic value of the communication and finally the hedonic value of LSS. Therefore, we hypothesize:

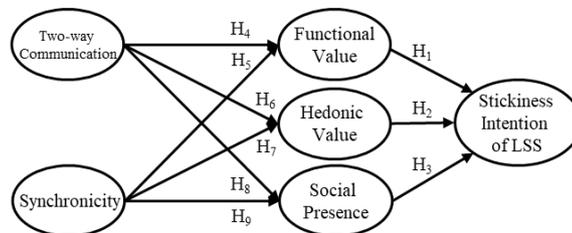
*H<sub>6</sub>: The interactivity in terms of two-way communication between retailer and customer positively influences the hedonic value of LSS.*

*H<sub>7</sub>: The interactivity in terms of synchronicity between retailer and customer positively influences the hedonic value of LSS.*

As usual, the perception of the retailer by his customers highly depends on how the retailer will react to their messages, what information s/he provides, which questions are answered, how they are answered and how competent the retailer appears. However, despite the high dependence on the retailer's personal traits, the interactivity only enables the customers to contact the retailer and ask their questions. In particular in the online context, the interactivity can alleviate the sense of physical distance among retailers and customers [27], [29]. Therefore the interactivity allows the customer to sense the social presence of the retailer and “the consequent appreciation of an interpersonal relationship, despite the fact that they are located in different places, may operate at different times and that all communication is through digital channels” [44, p. 633]. That means, the higher the interactivity capabilities are, the better the retailer can also influence their perception of him/her which finally affects his/her social presence. Hence, we hypothesize:

*H<sub>8</sub>: The interactivity in terms of two-way communication between retailer and customer positively influences the social presence of the retailer.*

*H<sub>9</sub>: The interactivity in terms of synchronicity between retailer and customer positively influences the social presence of the retailer.*



**Figure 1.** Research model.

## 4 Analysis

### 4.1 Data Collection

Our target population comprised customers in Germany. Despite the low usage of LSS in Germany, German customers have already prior experience in similar LSS activities like teleshopping or watching testing/describing product videos on YouTube before making a purchase decision [45], [46]. Also the interactivity with the streamer is not new to them. Particularly customers of younger age (like in our sample) have some prior experience interacting with broadcasters on streaming platforms like YouTube or twitch [47], [48]. However, to avoid any misunderstandings of our questionnaire by the participants, the standardized survey started with a detailed introduction. The introduction is based on the actual process of an LSS in Germany and the LSS literature. In cooperation with the retailer MINETTE, we provided pictures of a live-stream show (e.g., a picture of the chat or the retailer's product presentation) and added weblinks (Douglas, MINETTE and Zwillingsherz) so that the participants could re-watch or join an actual LSS before starting the survey [9], [49], [50]. Each participant answered the questions about the LSS. The first part of the survey collected data on the exogenous constructs (e.g., hedonic value). The second part of the survey collected demographic data (e.g., preferred online shopping device, age and gender). Using the snowball principle for the distribution of the survey, we collected 348 responses in total. The data was gathered between June and July 2021 in Germany with "*Limesurvey*". We also shared the survey link on "*SurveyCircle*".

Considering the recommendation of Hair et al. [51], 92 responses with more than 15% missing values had to be eliminated. 256 responses could be used for the analysis. Moreover, the model complies with the second rule of minimum sample size: 256 responses compared to the minimum sample size of 40 required cases [52]. The demographic show that 68% are female, 29,6% are male, 0.4% divers and 2% did not provide any information regarding the gender; 37.8% are between 18-24 years old, 43.3% are between 25-34 years old, 17.5% are older than 34 years, and 1.4% did not provide any information regarding the age. We also asked which device the participants used for their e-commerce purchases: 44% of the customer used their smartphone, 48% of the customers used their pc/laptop, and 1.5% of the customers used their tablet. 6.5% did not provide any information regarding the device.

### 4.2 Measurement Model

Due to the relatively small sample size, not normally distributed data, and the fact that we want to predict key target constructs for a new kind of technology, the partial least square (PLS) approach is the appropriate analysis method [51-54]. The structural equation approach consists of an outer and an inner model [52]. The outer measurement model defines the relations between constructs and items. The inner model represents the relations among the constructs [55]. All items were adapted from former studies to improve content validity [52], [56] and were measured using a five-point Likert scale ("strongly disagree" to "strongly agree"). We ran the statistical data analysis with

SmartPLS3 software and applied a non-parametric bootstrapping method with 5000 sub-samples.

**Table 1.** Reliability and Validity of Constructs

Constructs	Alpha	CR	AVE
Synchronicity	0.857	0.901	0.696
Two-Way Communication	0.851	0.900	0.692
Functional Value	0.834	0.882	0.600
Hedonic Value	0.806	0.865	0.561
Social Presence	0.920	0.944	0.807
Stickiness Intention	0.820	0.891	0.732

To assess the indicator reliability of the reflective constructs, we checked the outer loading of the items and the significance. All items had sufficient outer loadings  $>0.7$  and were significant at the 1% level [51-53]. The calculated Cronbach's alpha (Alpha) coefficient exceeds the recommended threshold of 0.7 for all constructs in the model [57]. The composite reliability (CR) coefficient exceeds the recommended threshold of 0.7 for all constructs. The convergent validity, average variance extracted (AVE), is also higher than 0.5 for all constructs [58] (see Table 1). Moreover, all model constructs have positive and significant correlations at the 1% level, where .203 is the lowest and .713 is the highest value. For the assessment of the validity, we consider the cross-loadings of the constructs and the Fornell-Larcker criterion. For this, the loading of an item to its construct must exceed all other loadings to the other constructs, which is the case [51-53]. For the Fornell-Larcker criterion, the squared AVE of a construct must be greater than its highest correlation with another construct, which is also the case [51-53]. Recent research shows that the Fornell-Larcker criterion and the assessment of the cross-loading are insufficiently sensitive to detect discriminant validity problems [59], [60]. Therefore, we used the heterotrait-monotrait ratio of correlations (HTMT) to identify discriminant validity. We selected the HTMT<sub>85</sub> and HTMT<sub>90</sub> to assess discriminant value and confirm discriminant validity with an HTMT<sub>85</sub> and HTMT<sub>90</sub> of all constructs [59].

### 4.3 Structural Model

For the evaluation of the structural model, we only consider the research model in stage two. To validate the model, we tested for the variance inflation factors (VIFs) of each item and construct to identify potential multicollinearity. The VIF values of the items ranged from 1.511 to 3.957, and of the constructs ranged from 1.459 to 2.033, suggesting that multicollinearity is not a concern [55]. Additionally, we controlled for a common method bias (CMB) by checking for overlap in items in different constructs [61]; running Harman's single-factor test with an unrotated factor analysis [62]; controlling the correlation matrix for correlation greater than  $r > 0.90$  [63] and considering the approach of Kock [64]. All results indicated that CMB is not a concern.

Next, we assessed the primary evaluation criteria with the  $R^2$  level and the significance of the path coefficient. The structural model shows a weak  $R^2$  level for stickiness ( $R^2$  31.3%), social presence ( $R^2$  31 %), functional value ( $R^2$  28.6 %) and hedonic value ( $R^2$  28.8 %). We also quantified how substantial the significance effects are by assessing their effect size  $f^2$ . For the interpretation of the  $f^2$ , we follow the guidelines by Cohen [65]: strong (0.35), moderate (0.15) and weak (0.02) (see Table 2).

The bootstrapping analysis of 5000 sub-samples allows for statistical testing of the hypotheses. The relationship between functional value and stickiness is significant at the 1% level, supporting our hypothesis  $H_1$  with a moderate effect size. The hedonic values have a negative significant influence on the stickiness intention at the 5% level with a moderate effect size. However, we cannot confirm Hypothesis  $H_2$  because the hedonic value negatively influences the stickiness intention and is not positive, as we argued. Hypothesis  $H_3$  can be confirmed at the 1% level. Social presence significantly influences stickiness with a moderate effect size. The two-way communication significantly positively influence the functional value, hedonic value and social presence. Therefore, we can confirm the hypothesizes  $H_4$ ,  $H_6$  and  $H_8$  at the 1% level with a moderate effect size. The synchronicity does not significantly influence the functional value, hedonic value and social presence. Therefore, we cannot confirm the hypothesizes  $H_5$ ,  $H_7$  and  $H_9$  (see Table 2).

**Table 2.** Estimation Results

Hypothesis	Path Coefficient	T-Statistic	Effect Size
<b>H<sub>1</sub></b> Functional Value → Stickiness	0.512	9.544**	0.243
<b>H<sub>2</sub></b> Hedonic Value → Stickiness	-0.137	2.379*	0.016
<b>H<sub>3</sub></b> Social Presence → Stickiness	0.205	3.390**	0.042
<b>H<sub>4</sub></b> Two-Way C. → Functional Value	0.505	6.123**	0.176
<b>H<sub>5</sub></b> Synchron. → Functional Value	0.041	0.525 <sup>ns</sup>	0.001
<b>H<sub>6</sub></b> Two-Way C. → Hedonic Value	0.499	6.042**	0.172
<b>H<sub>7</sub></b> Synchron. → Hedonic Value	0.051	0.655 <sup>ns</sup>	0.002
<b>H<sub>8</sub></b> Two-Way C. → Social Presence	0.596	7.619**	0.253
<b>H<sub>9</sub></b> Synchron. → Social Presence	-0.057	0.738 <sup>ns</sup>	0.002

1% level \*\*; 5% level \*; <sup>ns</sup> non-significant

In the last step, we ran a nonparametric permutation test with a bootstrapping of 5000 sub-samples to assess group-specific differences in our sample [66]. First, we checked for equal or comparable subgroups. The subgroups of gender (female 175; male 76), devices (pc/laptop 123; smartphone 113) and partly age (18-24: 97; 25-34: 111) can be considered as comparable or fulfil the 80% of the statistical power for a 1% significance level with a minimum 0.25  $R^2$  [66], [67]. Groups with fewer observations (age >35) should not be used due to the lack of statistical power [68].

In the second step, we test for invariance, which has two components with the configural and compositional to avoid misleading results [66]. The configural invariance is fulfilled. For the compositional invariance, we compare the composite scores of both

groups (e.g. female and male) to determine if the correlation, mean, and variance are significantly different for the empirical distribution. The constructs must pass the correlation and need to pass the two confidence (mean and variance) tests for invariance or one for partial invariance [66]. We can confirm invariance for the subgroups devices and partial invariance for the subgroups age and gender. For the subgroup gender, we find partially invariance for the constructs hedonic value, social presence and two-way communication. For the subgroup age, we find partially invariance for the constructs social presence, synchronicity and two-way communication.

The results show no significant differences regarding the subgroup device and gender. However, the nonparametric permutation test revealed significant differences for the subgroup age (18-24 vs. 25-34). We find a positive path coefficient for the retailers' social presence for people between 25-34 years (0.249) compared to those between 18-24 years (-0.043) for hypothesis H<sub>3</sub> at the 5% level.

The results also revealed significant differences for the two-way communication for people between 25-34 years (0.456) compared to the people between 18-24 years (0.08) for hypothesis H<sub>6</sub> at the 5% level.

## 5 Results

### 5.1 Discussion

To the best of our knowledge, this is the first attempt to empirically explain customer behavior regarding live-stream shopping in Europe, particularly in Germany. Moreover, this is the first study that employs the Computer-Mediated Communication Interactivity Model (CMCIM) in the live-stream context with the constructs two-way communication and synchronicity. These constructs (partially) explain the communication process between retailer and customer in the live-stream context. As our research shows, the influence of retailers' social presence and the two-way communication differ among younger and older customers.

With regard to RQ1, what are the antecedents of customers' stickiness intention of live-stream shopping. Our study shows the importance of the functional value for customers' stickiness intention which is the main driver for German customers stickiness intention. Apparently, German customers have a work mentality regarding live-stream shopping. This is consistent with studies focusing on the stickiness intention in the websites [32] or social networks context [18], in the general live-stream context investigating product-related factors [3], the intention to use [6] and intention to buy [21], [22] as well as in the LSS context in Europe [7].

In contrast to the functional value, the hedonic value had a weak but significant negative impact on the stickiness intention which contradicts previous studies of the live-stream context [6], [22] [25] of the websites context [32] or of the social media context [18], [39]. The results support recent reports attesting Germans to have a working mentality even when shopping [69]. Perceived pleasure and happiness did not lure German customers into sticking to the retailers live-stream within our study. However, this contradicts older studies [70] so that further investigations are needed.

In line with previous research [6], [26], [29], the social presence also plays an important role for LSS. The higher the social presence is, the more the customers will stick to LSS. The reason is that retailers who create a high social presence, can deliver more information to customers, which enhances their perceived transparency and helps to establish closer relationships [26], [71]. Therefore, social presence is a decisive driver of stickiness intention.

Regarding RQ2, “How do the different dimensions of interactivity affect customers’ stickiness intention of live-stream shopping?”, the results generally confirm the significant importance of interactivity in the live stream context [6], [15]. In particular, our study shows that the dimensions of interactivity significantly differ regarding their influence on the functional value, hedonic value and the retailers’ social presence.

While the two-way communication exerts a significant impact on all three constructs, the influence of synchronicity could not be confirmed. Obviously, it is important to customers, that they are able to ask questions directly and that these questions are answered by retailers. But retailers do not need to answer immediately to the customers’ questions as long as they finally give the answer. However, this may be because customers still need to get used to the interactivity with the retailer.

Regarding RQ3, “How do the customers’ devices and other group differentiators affect customers’ stickiness intention of live-stream shopping?”, the non-parametric permutation test revealed that customers do not significantly differ concerning user device or gender but with regard to age. The retailer’s social presence positively influences older customers but shows no effect for younger customers. This confirms previous studies from the mobile payment field that show that older people require greater involvement from their own social networks to adopt new digital services [68]. The same holds for the relation between two-way communication and hedonic value. While the two-way communication with the retailer significantly increases the hedonic value for older customers, there is no effect for younger customers.

## **5.2 Managerial Implications**

Several lessons can be learned from this study. First, German retailers should focus on information during live-stream sessions instead of providing an entertaining program. They should be well prepared and know their products so that they can answer their customers’ questions precisely. But they do not need to be funny or full of anecdotes. Instead, they need to be very careful with those entertaining aspects as they can easily force customers to leave the session when not enough information is provided. As a result, live-stream retailers should present their products with much information and visualize the products so that customers get a good picture of the products and can imagine what these products look like or what is the real size. This saves time to customers and releases them from going to the city center to learn about the products. Live-stream retailers should use this advantage, support the customers’ decision making and make the order process as easy as possible. This will increase customers’ stickiness, form a positive customer attitude towards the retailer, the presented content and products and will finally affect the intention to purchase.

Second, retailers should pay attention to their real-time interaction with customers. While response time to customer questions is not important, the listening and responding is. Therefore, live-stream retailers should facilitate communication during the live-stream session. For instance, they can provide a chat option so that customers can ask questions. The retailer should then give the customer the feeling that they are important to them and ask for customer feedback (e.g., whether the product is being held well in the camera). This helps to increase the communication quality during the live-stream session and finally generate sales.

As a consequence, retailers should thirdly use an effective communication strategy to increase their social presence. For instance, they can address the customer with her/his name when sending reactions or greetings at the beginning of the session. Especially when replying to customer comments, retailers should use this opportunity and make personalized recommendations to create a warm and personal environment. Moreover, the feeling of sociability due to the communication with the customer helps retailers to reduce the customer's uncertainty and makes it easier to build a close relationship with the customer.

But retailers should fourthly be aware that their social presence only addresses older customers positively. With their responses and the information they provide, they can greatly influence the stickiness intention of customers so that the success of LSS also greatly depends on them. But concerning younger customers, they need to rethink effective strategies to address this generation. Although not part of this study, a possible measure could be the booking of an influencer for a live-stream event. However, retailers need to decide how to use influencers for their product promotions and develop strategies on what influencers are highly effective or what product types the influencers can advertise. Therefore, retailers are well advised to carefully study their live-stream customers' and product characteristics before promoting strategies.

### **5.3 Limitation and Future Research**

First of all, the data sample is unbalanced regarding gender. This is a common problem of empirical studies as women are more likely to participate in surveys than men [72]. Also, the low LSS offering for male customers in Germany is a further hindering factor. However, the gender distribution of the study equals the gender distribution of former LSS studies e.g., [3], [6], [14]. Future research should consider this sampling bias and should also investigate LSS in a more neutral context. Second, the study is biased concerning age. The number of participants older than 35 years is quite limited. Therefore, a more balanced sample should be collected so that the behavior of older people can also be explained. Third, our study design provided a set of actions so that all participants could understand the process of LSS. However, our study did not control for the experience level. Hence, future studies should control for the experienced level of participants. Fourth, although considered as being still big enough, a greater sample size could increase the power of the model. Therefore the results of the model should be interpreted with caution.

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