

Please quote as: Eigenbrod, L. & Janson, A. (2018): How Digital Nudges Influence Consumers - Experimental Investigation in the Context of Retargeting. In: European Conference on Information Systems (ECIS). Portsmouth, UK.

HOW DIGITAL NUDGES INFLUENCE CONSUMERS – EXPERIMENTAL INVESTIGATION IN THE CONTEXT OF RETARGETING

Research in Progress

Abstract

Retargeting is an innovative online marketing technique in the modern age. Although this advertising form offers great opportunities of bringing back customers who have left an online store without a complete purchase, retargeting is risky because the necessary data collection leads to strong privacy concerns which in turn, trigger consumer reactance and decreasing trust. Digital nudges – small design modifications in digital choice environments which guide peoples' behaviour – present a promising concept to bypass these negative consequences of retargeting. In order to prove the positive effects of digital nudges, we aim to conduct an online experiment with a subsequent survey by testing the impacts of social nudges and information nudges in retargeting banners. Our expected contribution to theory includes an extension of existing research of nudging in context of retargeting by investigating the effects of different nudges in retargeting banners on consumers' behaviour. In addition, we aim to provide practical contributions by the provision of design guidelines for practitioners to build more trustworthy IT artefacts and enhance retargeting strategy of marketing practitioners.

Keywords: Retargeting, Digital nudging, E-commerce, Consumer behaviour.

1 Introduction

23% of the German companies stated that the share of their online advertising budget on the overall advertising budget was 80% or more in 2016 (Statista, 2016). Another study shows that spending on online advertising in Europe increased by € 35.2 billion between 2006 and 2016 (IAB Europe, 2017). Hence, many advertisers are confronted with intense competition concerning consumer attention in e-commerce (Frick and Li, 2016). For that reason, advertisers are constantly looking for new and innovative online marketing techniques which offer opportunities to adapt the advertising messages to the behaviour and preferences of the consumers (Zarouali et al., 2017).

Retargeting is one of these innovative techniques (Zarouali et al., 2017) and denotes the use of banners that represent personalized advertising content based on consumers' browsing behaviour on recently visited websites (Bleier and Eisenbeiss, 2015). Retargeting banners approximately reach 75% of customers, i.e., they explicitly take notice of the banners, and around 40% call the personalized banners helpful within their buying process (GreenAdz, 2015). On the one hand, the browsing behaviour offers an adequate possibility to meet the preferences of consumers through targeted advertising content (Lambrecht and Tucker, 2013). On the other hand, retargeting is risky because consumers may feel observed and constrained (White et al., 2008) which may in turn raise privacy and security concerns (King and Jessen, 2010). Building trust in each online retailer can help consumers feel safe, reduce their concerns and, as a result, improve retargeting performance (Bleier and Eisenbeiss, 2015). The application of digital nudges in information systems (IS) – small design modifications in digital choice environments which guide peoples' behaviour (Weinmann et al., 2016) – seems to be a promising concept in this area to avoid the problems of retargeting by increasing trust in online retailers and positively influencing consumers' behaviour. As such, there is a lack of research regarding nudging in context of retargeting which should be addressed in this research-in-progress paper by examining the impact of nudges in retargeting banners on consumers' behaviour. Hence, the goal of this study is to shed light on the application and design of suitable nudges in retargeting banners by conducting an experimental testing. The guiding research questions (RQ) for our overall study are as follows:

RQ1: Which nudges are suitable to build trust and positively influence consumers' behaviour?

RQ2: How effective are the identified nudges to influence consumers' behaviour?

With our research, we expect to provide answers to our RQs as well as a more detailed understanding of nudges in online contexts. Our study addresses the interface of marketing and IS, thus contributing with a theory of explanation and prediction (Gregor, 2006) of nudges in the context of retargeting to the current challenges in the field of digital advertising through new information technology trends. The remainder of this research-in-progress paper is structured as follows. First, we provide a brief overview of theoretical background of retargeting and digital nudging. Next, we develop our hypotheses and theoretical model. In section four, we present the research method to evaluate the theoretical model, before we close with an overview of our expected contribution and next steps.

2 Theoretical Foundations

2.1 Retargeting

Retargeting is a form of online marketing designed to target customers based on their online activities (Ghose and Todri, 2016). Thanks to the personal browsing behaviour, the advertising content can be adapted to their personal preferences (Schellong et al., 2017; Zarouali et al., 2017). Retargeting seems to be a promising strategy to bring back potential customers (Yeo et al., 2017) because over 95 % of the internet users leave an online shop without a completed purchase (Fösken, 2012). As we can see, retargeting only addresses customers who have already visited the website (Yang et al., 2015). An often used tracking technology is the application of so-called cookies which identifies the internet users (Lambrecht and Tucker, 2013). The most prominent forms of retargeting are the generic and the dynamic retargeting (Schellong et al., 2016). Whereas the generic retargeting is characterized only by

general images of the previously visited website with, for example, the logo of the brand, the advertising banner of dynamic retargeting is marked by the products the potential consumer has previously looked at (Lambrecht and Tucker, 2013). Although on the one hand, the underlying personalization of retargeting leads to higher advertising relevance for the consumers (Tsekouras et al., 2016), on the other hand, the consumers understand the accumulation of their data as a kind of attack on their privacy (Awad and Krishnan, 2006). Consequences are increasing advertising avoidance (Baek and Morimoto, 2012), negative attitudes and lower purchase intentions (Yu and Cude, 2009). The underlying phenomenon is called personalization-privacy-paradox which denotes the dilemma between the rising application of personalized advertising and the increasing privacy concerns of the consumers (Lee et al., 2011; Sutanto et al., 2013; Taylor et al., 2009). The increasing privacy concerns can result in immense negative impacts on consumers’ trust in the e-retailer and their behavioural intentions which in turn threaten the success of retargeting itself. An opportunity to build trust in the e-retailer as well as to positively influence consumers’ behaviour is the integration of digital nudges in the retargeting banners. For that reason, the next chapter is about the basics of digital nudging.

2.2 Digital Nudging

The nudge theory – originally derived from behavioural economics (Mirsch et al., 2017) – is based on the irrational behaviour of human beings (Weinmann et al., 2016). A nudge “is any aspect of the choice architecture that alters people’s behavior in a predictable way without forbidding any options or significantly changing their economic incentives” (Thaler and Sunstein, 2008, p. 6). The design of choice architecture by nudges is called nudging (Mirsch et al., 2017). The previous focus of the nudging concept was mainly in offline contexts (Djurica and Figl, 2017; Schneider et al., 2017; Weinmann et al., 2016) and is applied in almost all areas of life, like the health service/medicine (e.g., Johnson and Goldstein, 2003; Lehmann et al., 2016), food consumption (e.g., Guthrie et al., 2015), personal finance (e.g., Rodriguez and Saavedra, 2015; Thaler and Benartzi, 2004), politics (e.g., Alemanno and Spina, 2014) or charity (e.g., Croson and Shang, 2008). One prominent nudging example is the use of default options as part of organ donor systems where the changing from opt-in to opt-out leads to a higher percentage of organ donors (Weinmann et al., 2016).

As more and more decisions are made online today, such as purchases, holiday bookings, insurances and so on, nudging is becoming increasingly important in the digital context as well (Mirsch et al., 2017). “Digital nudging is the use of user-interface design elements to guide people’s behavior in digital choice environments” (Weinmann et al., 2016, p. 433). It should however be emphasized that it is merely a subtle form of influence that preserves individuals’ freedom of choice (Meske and Potthoff, 2017). Digital choice environments are, e.g., websites or mobile applications (Weinmann et al., 2016). The following table presents application examples of nudges in the e-commerce context:

Nudge	Example	Psychological Effect	Source
Product Recommendation	Presentation of product-similar articles on product pages	Framing	Mirsch et al., 2017
Pressure Cue	Product limitation (e.g., limited hotel rooms)	Loss Aversion	Amirpur and Benlian, 2015; Djurica and Figl, 2017
Social Influence Cue	Social Popularity (number of likes)	Social Norms	Yi et al., 2014
	Social Rankings (product ratings)		Deng et al., 2016
Disclosure	Disclosure of privacy policy	Priming	Bansal et al., 2008; Pan and Zinkhan, 2006
Defaults	Making a preselection by setting defaults, e.g. a travel insurance	Status Quo Bias	Mirsch et al., 2017

Table 1. Application examples of nudges in the e-commerce context

As seen in the examples above, nudging in the field of e-commerce is a proliferating research. However, up until now, attempts to integrate rigorous research to experimentally test the effects of different nudging possibilities remain scarce.

3 Hypotheses Development

To overcome the aforementioned challenges of nudging research in e-commerce, in the following we derive a comprehensive theoretical model that enables us to research nudging consequences. The basis of the following hypothesis development is the Stimulus-Organism-Response Model (SOR) of Mehrabian and Russell (1974) which stems from environmental psychology. It proposes that the environmental stimuli (Stimulus) influence the psychological processes of the individuals (Organism) which in turn impacts the individual behaviour (Response) (Mehrabian and Russell, 1974). Due to the fact that the SOR-Model has been widely applied to e-commerce and online shopping (Amirpur and Benlian, 2015; e.g., Eroglu et al., 2003; Peng and Kim, 2014; Sheng and Joginapelly, 2012; Xu et al., 2014), and on top of that in the digital nudging context (Hummel et al., 2017), it is also suitable for this study. The stimuli arouse individuals' attention and denote all hints influencing consumers (Eroglu et al., 2001), like products, brands or logos (Jacoby, 2002). The organism describes the cognitive and/or affective processes between the stimulus and the response (Eroglu et al., 2001). Responses are for example the willingness to buy or rejection (Sheng and Joginapelly, 2012). Adapted to the underlying context, the stimuli are the nudges as part of the retargeting banners, the organism presents the cognitive processes which are triggered by the nudges and the response is the behaviour of the consumers which refers to a hotel booking process. This study concentrates on social nudges and information nudges which will be presented in the following section.

Social Nudges

Social nudges indicate how popular a product is by showing how much persons already bought it or liked it (Yi et al., 2014) or by presenting customer reviews (Deng et al., 2016). The majority's decision influences perception and behaviour of individuals in a way (Zhang and Xu, 2016) that others get the feeling of trying to imitate the behaviour of the majority (Coventry et al., 2016). The more people have the same opinion on a particular topic, the more likely it is to elicit the same opinion in others (Wang and Chang, 2013) because behaviour of like-minded people leads to individual behaviour (Bakshy et al., 2012). In terms of buying behaviour, this means the following: The individual perceived risk of repentance after a purchase decision decreases if other consumers have made the same decision (Wang and Chang, 2013) which, in turn, makes the own purchase more likely. Furthermore, consumers worry less because others do the same too, which in turn leads to lower privacy concerns (Nov and Wattal, 2009; Zhang and Xu, 2016). Especially the application of social nudges in retargeting banners could be advantageous. Such nudges indicate that other customers as well as friends like the homepage of the e-commerce retailer too. This suggests that other people have also committed to and rely on the online retailer's homepage, which could also reduce the individual privacy concerns and increases the actual buying behaviour (in this study booking behaviour). Therefore, we hypothesize:

Hypothesis H1: The provision of social nudges in retargeting banners negatively influences consumers' privacy concerns.

Hypothesis H2: The provision of social nudges in retargeting banners positively influences consumers' booking behaviour.

Information Nudges

The advances in technology and the new trends in the Internet are steadily improving the collection, storage and dissemination of personal information, which at the same time means that consumers sometimes have no knowledge of the use of their data and thus lose control of the dissemination of their personal information (Arcand et al., 2007). The disclosure of these procedures provides transparency which is really appreciated by the consumers (Steffel et al., 2016) and which in turn decreases consumers' concerns (Miyazaki and Fernandez, 2000). This is the case because only the mere presence of privacy policy already has a positive impact on consumers' perceived control (Arcand et al.,

2007). Perceived control denotes the idea of consumers to influence the collection and distribution of their personal data (Xu et al., 2010; Xu et al., 2012). The application of social nudges in retargeting banners that disclose the e-retailer's privacy policy and the purpose of this personalized advertising form are suitable to create transparency and to avoid the personalization-privacy-paradox (Lee et al., 2011; Sutanto et al., 2013; Taylor et al., 2009). Since consumers aren't well aware of whether the e-retailer is acting in their interest or in the interests of the e-retailer, social nudges can help to make the consumer understand that the e-retailer is acting in their favour. Thanks to personalization, consumers are only shown products based on their personal preferences. At the same time, this could have a positive effect on the consumers' perceived control of their personal data and on top of that, on their booking behaviour. Thus, we hypothesize:

Hypothesis H3: The provision of information nudges in retargeting banners positively influences consumers' perceived control.

Hypothesis H4: The provision of information nudges in retargeting banners positively influences consumers' booking behaviour.

Privacy and Trust

Consumers tend to have lower privacy concerns if they have the feeling of controlling their personal data (Dinev and Hart, 2004; e.g., Milne and Boza, 1999; Wilson et al., 2015; Xu, 2007). According to Westin (1967), privacy concerns are the ability to control the collection and use of personal data. For that reason, it is obvious that individual privacy concerns are to a certain extent generated by the feeling that they no longer have control over the collection and use of personal data (Hong and Thong, 2013). In consequence, the negative relationship between consumers' perceived control and their privacy concerns could be a logical consequence. Thus, we hypothesize:

Hypothesis H5: Consumers' perceived control negatively influences consumers' privacy concerns.

The reactance theory according to Brehm (1966) proposes that a limitation of freedom leads to reactance, a psychological resistance (White et al., 2008). Following this theory, consumers' privacy concerns, which are triggered by the loss of control over personal information, can be understood as fear of a restriction of freedom. In accordance with previous literature (Chen et al., 2017; e.g., Park, 2009), we assume a positive relationship between consumers' privacy concerns and their reactance. This ultimately leads to the following hypothesis:

Hypothesis H6: Consumers' privacy concerns positively influence consumers' reactance.

The perceived loss of freedom which is triggered by reactance can have a negative impact on consumers' confidence (Lee et al., 2014). A differentiation of the trust concept in trusting beliefs – consumers' perceptions towards the e-retailer (Bartikowski and Merunka, 2015) – and trusting intentions – intent of the trustor to become dependent on the trustee (McKnight et al., 2002) – suggests a negative relationship between consumers' reactance and their trusting beliefs towards the e-retailer. For that reason, the following hypothesis is assumed:

Hypothesis H7: Consumers' reactance negatively influences consumers' trusting beliefs towards the e-retailer.

Based on the theory of reasoned action of Fishbein and Ajzen (1975), which states that beliefs lead to attitudes which in turn lead to intentions and finally to behaviour and the trust model of McKnight et al. (2002), trusting beliefs lead to trusting intentions. On top of that, other literature streams of e-commerce were able to prove that trusting beliefs positively influence trusting intentions (Dimitriadis and Kyrezis, 2010; Kim and Kim, 2011; e.g., Lowry et al., 2008). Thus, we also hypothesize:

Hypothesis H8: Consumers' trusting beliefs positively influence consumers' trusting intentions towards the e-retailer.

Since previous research was able to prove strong correlations between intentions and actual behaviour (e.g., Sheppard et al., 1988; Venkatesh and Davis, 2000), we assume a positive relationship between consumers' trusting intentions and their actual booking behaviour. If customers are willing to trust retailers for example in handling sensitive credit card information, they will also be more likely to make a transaction on an e-commerce platform. Thus, we hypothesize:

Hypothesis H9: Consumers' trusting intentions positively influence consumers' actual booking behaviour.

Our research model with the underlying hypotheses is depicted in the following figure:

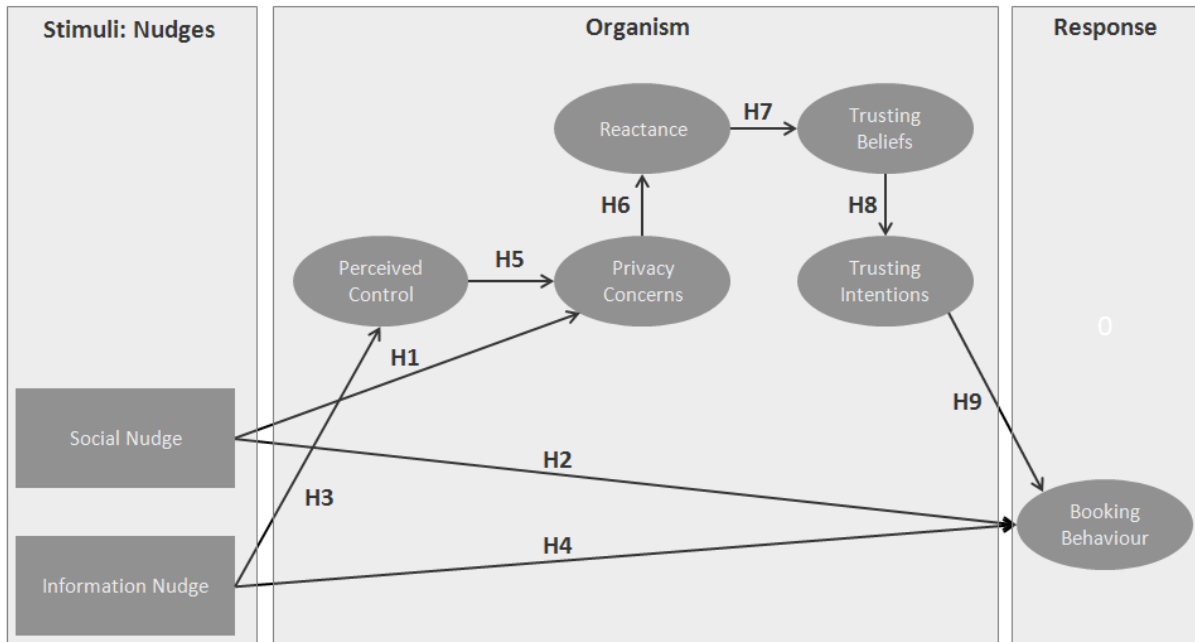


Figure 1. Research Model

4 Research Design and Method

To test the underlying hypotheses of the research model, we are currently conducting an online experiment with a subsequent survey. Until today, 255 participants completed the surveys. They were recruited on several social media platforms and university courses to reach a diverse audience that is also targeted by e-commerce platforms. The experiment proceeds as follows: Within the online experiment, the participants first receive an exact description of the procedure. In the first step, they are asked to search for hotels on a holiday island on the fictitious homepage "mytravelness". They receive a selection of three hotels and are asked to choose one hotel. After the selection, in the presented scenario the booking process is aborted because some things have to be checked before the final booking. The participants are asked to visit the fictitious social network "Networking" to check with a friend whether he could drive them to the airport. Furthermore, they are asked to look how the weather will be at the holiday location by visiting the fictitious homepage "island weather". At the end, they are asked to check their fictitious bank balance by visiting an online banking site. On these three homepages they are repeatedly confronted with the retargeting banner of the hotel booking homepage "mytravelness". As a last step, the participants are asked to continue the booking process by clicking on a banner of "mytravelness". In this last step, participants could freely decide whether they would book the hotel with "mytravelness" or not before continuing. Following this set-up, they are directed to the survey, where they are asked to answer two questions about the experiment content to ensure that the experiment was conscientiously completed. After that, we check the experimental manipulation by three items in order to ensure that participants recognize the nudges presented in their experimental group. The following figure shows the experimental process.

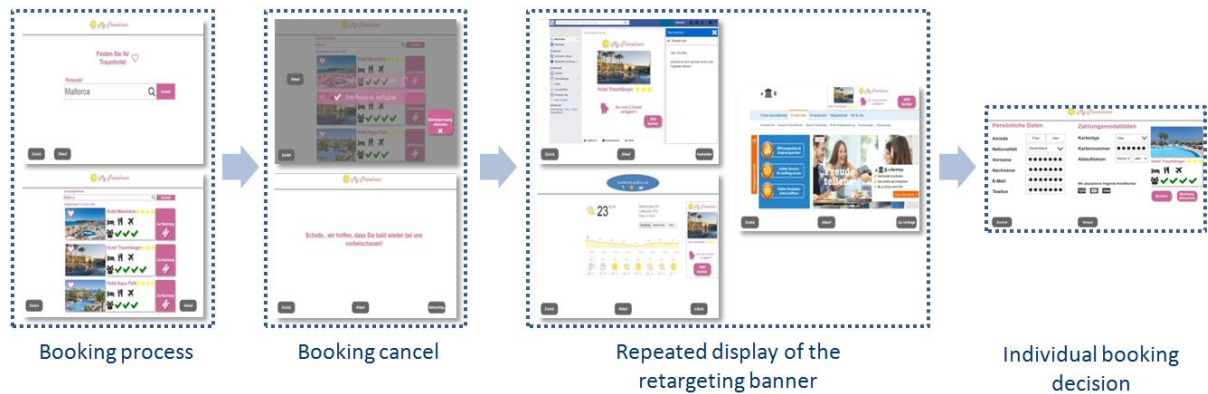


Figure 2. Experimental process

The online experiment is based on a between-subject design with a control group and three treatment groups. Following this design, the treatment groups are only exposed to one treatment and the assignment of the subjects to the groups is randomized (Charness et al., 2012). The treatment refers to two different nudges as part of the retargeting banner. The following table presents an overview of the different groups and the underlying nudges.

Group	Nudge
Control Group	/
Treatment Group 1	Social Nudge
Treatment Group 2	Information Nudge
Treatment Group 3	Social and Information Nudge

Table 2. Overview of groups

The design of the social nudge follows a social popularity statement which indicates how many fictitious friends like the hotel booking homepage “mytravelness”. In accordance with Wang et al. (2013), the presentation of profile pictures ought to create a clear idea of which friends like the homepage to increase attention. The information nudge contains an info icon which discloses the privacy policy of “mytravelness” and the purpose of the retargeting banner. All experimental conditions were pre-tested to ensure manipulation. Figure 3 shows the retargeting banners with the two different nudges.

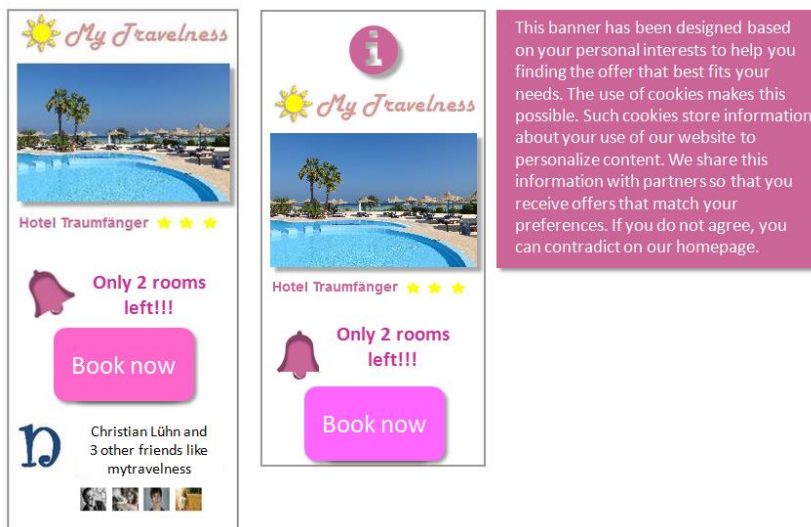


Figure 3. Exemplary retargeting banner with nudges

Common method variances that are caused by the measurement method rather than the construct measures were also taken into account considering the latent constructs (Podsakoff et al., 2003). According to Podsakoff et al. (2003), these biases can be controlled by several procedural remedies which were also used in the present study. In order to ensure a psychological separation of measurement, we did not reveal the purpose of the experiment and provided a cover story. Additionally, we assured the anonymity of the participants. In order to control for effects such as socially desirable responses (Paulhus, 2002), we assured that there were no wrong answers and that the respondents answered questions as honestly as possible (Podsakoff et al. 2003).

For the operationalization of our research model, we use well-established scales and adapt them to the context of digital nudging and retargeting. Table 4 shows the latent construct measures and, if applicable, corresponding literature sources of the indicators.

Latent Construct	Latent Construct Type	Literature Source
Perceived Control	Reflective	Zhang and Xu, 2016
Privacy Concerns	Reflective	Bleier and Eisenbeiss, 2015
Reactance	Reflective	
Trusting Beliefs	Reflective	Wang and Benbasat, 2008
Trusting Intentions	Reflective	McKnight et al., 2002

Table 3. Measurement of constructs and literature sources

We measure all latent variables with reflective indicators. For this purpose, we evaluated the measurement instrument with regards to its suitability to measure the constructs in a reflective manner. This was done by checking the reflective constructs according to the guidelines of Jarvis et al. (2003). We use a 7-point Likert response format that ranges from 1 (“strongly disagree”) on the left to 7 (“strongly agree”) on the right, with 4 as a neutral point to assess the indicators. The experimental manipulations are coded as binary variables. In addition, we measure booking behaviour through the behaviour of the participants in the experimental environment, also with a binary coding. To increase statistical power and reliability of our results, we additionally use instruction manipulation checks to detect participants that do not read and follow our instructions (Oppenheimer et al., 2009).

To evaluate the proposed research model in this study, we use structural equation modelling with the variance-based partial least squares (PLS) approach (Chin, 1998; Wold, 1982). We chose this approach because it is more suitable to identify key constructs than covariance-based approaches (Hair et al., 2011). We use SmartPLS 2.0 M3 (Ringle et al., 2005) as well as SPSS 24 (for descriptive analysis as well as testing differences across groups and interaction effects) as our tools of analysis.

5 Expected Contribution and Outlook

Our expected contribution is twofold. On the one hand, we contribute with our theory of explanation and prediction (Gregor, 2006) to existing research of nudging in context of retargeting by evaluating the effects of nudges in retargeting banners on consumers’ behaviour. On the other hand, we provide guidance for marketing practitioners with design guidelines for a retargeting that is perceived as less intrusive, more trustworthy and, ultimately leading to a higher booking behaviour. Hence, we account for both IS research through nudging design guidelines that also can be used for facilitating design science research concerning digital nudging, as well as marketing literature through the enhancement of the retargeting method. With our completed research, we aim to provide effective nudges that work in context of retargeting and increase the marketing performance. This enables practitioners to ensure that their retargeting strategies are improved which in turn leads to, for example, higher conversion rates in the long run. As outlook, our next steps are therefore concerned with the data analysis as soon as the data collection is finished and the communication of our research results in a completed research paper.

References

- Alemanno, A. and Spina, A. (2014) 'Nudging legally: On the checks and balances of behavioral regulation', *International Journal of Constitutional Law*, vol. 12, no. 2, pp. 429–456.
- Amirpur, M. and Benlian, A. (2015) 'Buying under Pressure: Purchase Pressure Cues and their Effects on Online Buying Decisions', *Thirty Sixth International Conference on Information Systems*. Fort Worth, pp. 1–18.
- Arcand, M., Nantel, J., Arles-Dufour, M. and Vincent, A. (2007) 'The impact of reading a web site's privacy statement on perceived control over privacy and perceived trust', *Online Information Review*, vol. 31, no. 5, pp. 661–681.
- Awad, N. F. and Krishnan, M. S. (2006) 'The personalization privacy paradox: an empirical evaluation of information transparency and the willingness to be profiled online for personalization', *MIS Quarterly*, vol. 30, no. 1, pp. 13–28.
- Baek, T. H. and Morimoto, M. (2012) 'Stay away from me', *Journal of Advertising*, vol. 41, no. 1, pp. 59–76.
- Bakshy, E., Eckles, D., Yan, R. and Rosenn, I. (2012) 'Social Influence in Social Advertising: Evidence from Field Experiments', *Proceedings of the 13th ACM Conference on Electronic Commerce*, pp. 146–161.
- Bansal, G., Zahedi, F. M. and Gefen, D. (2008) 'The Moderating Influence of Privacy Concern on the Efficacy of Privacy Assurance Mechanisms for Building Trust: A Multiple-Context Investigation', *Twenty Ninth International Conference on Information Systems*. Paris, pp. 1–19.
- Bartikowski, B. and Merunka, D. (2015) 'Modeling the effects of the three dimensions of trust towards the e-vendor on online consumer behavior', *Systèmes d'information & management*, vol. 20, no. 1, pp. 9–30.
- Bleier, A. and Eisenbeiss, M. (2015) 'The importance of trust for personalized online advertising', *Journal of Retailing*, vol. 91, no. 3, pp. 390–409.
- Brehm, J. W. (1966) *A theory of psychological reactance*, New York, Academic Press.
- Charness, G., Gneezy, U. and Kuhn, M. A. (2012) 'Experimental methods: Between-subject and within-subject design', *Journal of Economic Behavior & Organization*, vol. 81, pp. 1–8.
- Chen, Q., Feng, Y., Liu, L. and Ju, J. (2017) 'Understanding Consumers' Reactance of Online Personalized Advertising: from a Perspective of Negative Effects', *Proceedings of the 50th Hawaii International Conference on System Sciences*, pp. 5678–5687.
- Chin, W.W. (1998) 'The partial least squares approach for structural equation modeling', in Marcoulides, G. A. (ed) *Modern methods for business research*, Mahwah, N.J, Lawrence Erlbaum, pp. 295–336.
- Coventry, L. M., Jeske, D., Blythe, J. M., Turland, J. and Briggs, P. (2016) 'Personality and Social Framing in Privacy Decision-Making: A Study on Cookie Acceptance', *Frontiers in Psychology*, vol. 7, no. 1341, pp. 1–12.
- Croson, R. and Shang, J. (2008) 'The impact of downward social information on contribution decisions', *Experimental Economics*, vol. 11, no. 3, pp. 221–233.
- Deng, H., Wang, W. and Lim, K. (2016) 'Reducing User Avoidance of Sponsored Search Results: The Effects of Social Influence Cues', *Thirty Seventh International Conference on Information Systems*. Dublin, pp. 1–22.
- Dimitriadis, S. and Kyrezis, N. (2010) 'Linking trust to use intention for technology-enabled bank channels: The role of trusting intentions', *Psychology & Marketing*, vol. 27, no. 8, pp. 799–820.
- Dinev, T. and Hart, P. (2004) 'Internet privacy concerns and their antecedents - measurement validity and a regression model', *Behaviour & Information Technology*, vol. 23, no. 6, pp. 413–422.
- Djurica, D. and Figl, K. (2017) 'The Effect of Digital Nudging Techniques on Customers' Product Choice and Attitudes towards E-Commerce Sites', *Twenty-third Americas Conference on Information Systems*. Boston, pp. 1–5.

- Eroglu, S. A., Machleit, K. A. and Davis, L. M. (2001) 'Atmospheric qualities of online retailing: A conceptual model and implications', *Journal of Business Research*, vol. 54, no. 2, pp. 177–184.
- Eroglu, S. A., Machleit, K. A. and Davis, L. M. (2003) 'Empirical Testing of a Model of Online Store Atmospherics and Shopper Responses', *Psychology & Marketing*, vol. 20, no. 2, pp. 139–150.
- Fishbein, M. and Ajzen, I. (1975) *Belief, attitude, intention, and behavior - An introduction to theory and research.*, Addison-Wesley Pub. Co., Reading, Mass.
- Fösken, S. (2012) 'Targeting ist nicht alles', *Absatzwirtschaft*, pp. 88–91.
- Frick, T. W. and Li, T. (2016) 'Personalization in Social Retargeting- A Field Experiment', *Thirty Seventh International Conference on Information Systems*. Dublin, pp. 1–20.
- Ghose, A. and Todri, V. (2016) 'Toward a Digital Attribution Model: Measuring the Impact of Display Advertising on Online Consumer Behavior', *MIS Quarterly*, vol. 40, no. 4, pp. 1–22.
- GreenAdz (2015) *Studie: Zwei von drei Onlinern finden Re-Targeting-Banner unpassend: Akzeptanz von Re-Targeting-Werbung nur unter Vorbehalt* [Online]. Available at <http://www.greenadz.de/Archive/656> (Accessed 8 November 2017).
- Gregor, S. (2006) 'The nature of theory in information systems', *MIS Quarterly*, vol. 30, no. 3, pp. 611–642.
- Guthrie, J., Mancino, L. and Lin, C.-T.J. (2015) 'Nudging Consumers toward Better Food Choices: Policy Approaches to Changing Food Consumption Behaviors', *Psychology & Marketing*, vol. 32, no. 5, pp. 501–511.
- Hair, J. F., Ringle, C. M. and Sarstedt, M. (2011) 'PLS-SEM: Indeed a Silver Bullet', *Journal of Marketing Theory and Practice*, vol. 18, no. 2, pp. 139–152.
- Hong, W. and Thong, J. Y. (2013) 'Internet privacy concerns: An integrated conceptualization and four empirical studies', *MIS Quarterly*, vol. 37, no. 1, pp. 275–298.
- Hummel, D., Schacht, S. and Maedche, A. (2017) 'Designing adaptive nudges for multi-channel choices of digital services: A laboratory experiment design', *Twenty-Fifth European Conference on Information Systems (ECIS)*. Guimarães, pp. 2677–2688.
- IAB Europe (2017) *Investitionen in Online-Werbung in Europa in den Jahren 2006 bis 2016 (in Milliarden Euro)* [Online]. Available at <https://de.statista.com/statistik/daten/studie/154021/umfrage/ausgaben-fuer-online-werbung-in-europa/> (Accessed 22 November 2017).
- Jacoby, J. (2002) 'Stimulus-Organism-Response Reconsidered: An Evolutionary Step in Modeling (Consumer) Behavior', *Journal of Consumer Psychology*, vol. 12, no. 1, pp. 51–57.
- Jarvis, C. B., MacKenzie, S. B. and Podsakoff, P. M. (2003) 'A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research', *Journal of Consumer Research*, vol. 30, no. 2, pp. 199–218.
- Johnson, E. J. and Goldstein, D. (2003) 'Do defaults save lives?', *Policy Forum*, vol. 302, pp. 1338–1339.
- Kim, K. and Kim, J. (2011) 'Third-party Privacy Certification as an Online Advertising Strategy: An Investigation of the Factors Affecting the Relationship between Third-party Certification and Initial Trust', *Journal of Interactive Marketing*, vol. 25, pp. 145–158.
- King, N. J. and Jessen, P. W. (2010) 'Profiling the mobile customer—Is industry self-regulation adequate to protect consumer privacy when behavioural advertisers target mobile phones?—Part II', *Computer Law & Security Review*, vol. 26, no. 6, pp. 595–612.
- Lambrecht, A. and Tucker, C. (2013) 'When does retargeting work? Information specificity in online advertising', *Journal of Marketing Research*, vol. 50, no. 5, pp. 561–576.
- Lee, D.-J., Ahn, J.-H. and Bang, Y. (2011) 'Managing consumer privacy concerns in personalization: a strategic analysis of privacy protection', *MIS Quarterly*, vol. 35, no. 2, pp. 423–444.
- Lee, K. C., Lee, S. and Hwang, Y. (2014) 'The impact of hyperlink affordance, psychological reactance, and perceived business tie on trust transfer', *Computers in Human Behavior*, vol. 30, pp. 110–120.
- Lehmann, B. A., Chapman, G. B., Franssen, F. M., Kok, G. and Ruiters, R. A. (2016) 'Changing the Default to Promote Influenza Vaccination Among Health Care Workers', *Vaccine*, vol. 34, pp. 1389–1392.

- Lowry, P. B., Vance, A., Moody, G., Beckman, B. and Read, A. (2008) 'Explaining and Predicting the Impact of Branding Alliances and Web Site Quality on Initial Consumer Trust of E-Commerce Web Sites', *Journal of Management Information Systems*, vol. 24, no. 4, pp. 199–224.
- McKnight, D. H., Choudhury, V. and Kacmar, C. (2002) 'Developing and Validating Trust Measures for e-Commerce: An Integrative Typology', *Information Systems Research*, vol. 13, no. 3, pp. 334–359.
- Mehrabian, A. and Russell, J. A. (1974) *An approach to environmental psychology*, MIT Press.
- Meske, C. and Potthoff, T. (2017) 'The DINU-Model - A Process Model for the Design of Nudges', *Twenty-Fifth European Conference on Information Systems (ECIS)*. Guimarães, pp. 2587–2597.
- Milne, G. R. and Boza, M.-E. (1999) 'Trust and concern in consumers' perceptions of marketing information management practices', *Journal of Interactive Marketing*, vol. 13, no. 1, pp. 5–24.
- Mirsch, T., Lehrer, C. and Jung, R. (2017) 'Digital Nudging: Altering User Behavior in Digital Environments', *Proceedings der 13. Internationalen Tagung Wirtschaftsinformatik (WI 2017)*. St. Gallen, pp. 634–648.
- Miyazaki, A. D. and Fernandez, A. (2000) 'Internet Privacy and Security: An Examination of Online Retailer Disclosures', *Journal of Public Policy & Marketing*, vol. 19, no. 1, pp. 54–61.
- Nov, O. and Wattal, S. (2009) 'Social computing privacy concerns: antecedents and effects', *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, pp. 333–336.
- Oppenheimer, D. M., Meyvis, T. and Davidenko, N. (2009) 'Instructional manipulation checks: Detecting satisficing to increase statistical power', *Journal of Experimental Social Psychology*, vol. 45, no. 4, pp. 867–872.
- Pan, Y. and Zinkhan, G. M. (2006) 'Exploring the impact of online privacy disclosures on consumer trust', *Journal of Retailing*, vol. 82, no. 4, pp. 331–338.
- Park, I. (2009) 'The Study on The Relationship Between Privacy Concerns and Information Systems Effectiveness', *Thirtieth International Conference on Information Systems*. Phoenix, pp. 1–19.
- Paulhus, D. L. (2002) 'Socially Desirable Responding: The Evolution of a Construct', in Braun, H. I., Jackson, D. N., Wiley, D. E. and Messick, S. (eds) *The Role of Constructs in Psychological and Educational Measurement*, Mahwah, NJ: L. Erlbaum, pp. 49–69.
- Peng, C. and Kim, Y. G. (2014) 'Application of the Stimuli-Organism-Response (S-O-R) Framework to Online Shopping Behavior', *Journal of Internet Commerce*, vol. 13, 3-4, pp. 159–176.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y. and Podsakoff, N. P. (2003) 'Common method biases in behavioral research: A critical review of the literature and recommended remedies', *Journal of applied psychology*, vol. 88, no. 5, pp. 879–903.
- Ringle, C. M., Wende, S. and Will, A. (2005) *SmartPLS 2.0* [Online]. Available at <http://www.smartpls.com/>.
- Rodriguez, C. and Saavedra, J. E. (2015) 'Nudging Youth to Develop Savings Habits: Experimental Evidence Using SMS Messages', *CESR-Schaeffer Working Paper No. 2015-018*, pp. 1–52.
- Schellong, D., Kemper, J. and Brettel, M. (2016) 'Clickstream Data as a Source to Uncover Consumer Shopping Types in a Large-Scale Online Setting', *Twenty Fourth European Conference on Information Systems*. Istanbul, pp. 1–15.
- Schellong, D., Kemper, J. and Brettel, M. (2017) 'Generating Consumer Insights from Big Data Clickstream Information and the Link with Transaction-related Shopping Behavior', *Twenty-Fifth European Conference on Information Systems (ECIS)*. Guimarães, pp. 1–15.
- Schneider, D., Lins, S., Grupp, T., Benlian, A. and Sunyaev, A. (2017) 'Nudging Users Into Online Verification: The Case of Carsharing Platforms', *Thirty Eighth International Conference on Information Systems*. South Korea, pp. 1–20.
- Sheng, H. and Joginapelly, T. (2012) 'Effects of Web Atmospheric Cues on Users' Emotional Responses in E-Commerce', *Transactions on Human-Computer Interaction*, vol. 4, no. 1, pp. 1–24.
- Sheppard, B. H., Hartwick, J. and Warshaw, P. R. (1988) 'The theory of reasoned action: A meta analysis of past research with recommendations for modifications in future research', *Journal of Consumer Research*, vol. 15, no. 3, pp. 325–343.

- Statista (2016) *Online-Werbung - Anteil am gesamten Werbebudget 2016 / Umfrage* [Online]. Available at <https://de.statista.com/statistik/daten/studie/617590/umfrage/anteil-von-online-werbung-am-gesamten-werbebudget/> (Accessed 8 September 2017).
- Steffel, M., Williams, E. F. and Pogacar, R. (2016) 'Ethically Deployed Defaults: Transparency and Consumer Protection Through Disclosure and Preference Articulation', *Journal of Marketing Research*, vol. 53, no. 5, pp. 865–880.
- Sutanto, J., Palme, E., Tan, C.-H. and Phang, C. W. (2013) 'Addressing the Personalization-Privacy Paradox: An Empirical Assessment from a Field Experiment on Smartphone Users', *MIS Quarterly*, vol. 37, no. 4, pp. 1141–1164.
- Taylor, D. G., Davis, D. F. and Jillapalli, R. (2009) 'Privacy concern and online personalization: The moderating effects of information control and compensation', *Electronic Commerce Research*, vol. 9, no. 3, pp. 203–223.
- Thaler, R. H. and Benartzi, S. (2004) 'Save More Tomorrow™: Using Behavioral Economics to Increase Employee Saving', *Journal of Political Economy*, vol. 112, S1, 164–187.
- Thaler, R. H. and Sunstein, C. R. (2008) *Nudge: Improving Decisions About Health, Wealth, and Happiness*, New Haven & London, Yale University Press.
- Tsekouras, D., Frick, T. W. and Li, T. (2016) 'Don't Take It Personally: The Effect of Explicit Targeting in Advertising Personalization', *Thirty Seventh International Conference on Information Systems*. Dublin, pp. 1–18.
- Venkatesh, V. and Davis, F. D. (2000) 'A theoretical extension of the technology acceptance model: Four longitudinal field studies', *Management Science*, vol. 46, no. 2, pp. 186–204.
- Wang, J. C. and Chang, C. H. (2013) 'The impacts of online lightweight interactions as signals', *Thirty Fourth International Conference on Information Systems*. Milan, pp. 1–18.
- Wang, W. and Benbasat, I. (2008) 'Attributions of Trust in Decision Support Technologies: A Study of Recommendation Agents for E-Commerce', *Journal of Management Information Systems*, vol. 24, no. 4, pp. 249–273.
- Wang, Y., Leon, P. G., Scott, K., Chen, X., Acquisti, A. and Cranor, L. F. (2013) 'Privacy nudges for social media: an exploratory Facebook study', *Proceedings of the 22nd International Conference on World Wide Web*. New York, pp. 763–770.
- Weinmann, M., Schneider, C. and Vom Brocke, J. (2016) 'Digital Nudging', *Business & Information Systems Engineering*, vol. 58, no. 6, pp. 433–436.
- Westin, A. F. (1967) *Privacy and Freedom*, New York, Atheneum.
- White, T. B., Zahay, D. L., Thorbjørnsen, H. and Shavitt, S. (2008) 'Getting too personal: Reactance to highly personalized email solicitations', *Marketing Letters*, vol. 19, no. 1, pp. 39–50.
- Wilson, D. W., Schuetzler, R. M., Dorn, B. and Proudfoot, J. G. (2015) 'When Disclosure is Involuntary: Empowering Users with Control to Reduce Concerns', *Thirty Sixth International Conference on Information Systems*. Fort Worth, pp. 1–20.
- Wold, H. O. A. (1982) 'Soft Modeling: The Basic Design and Some Extensions', in Jöreskog, K. G. and Wold, H. O. A. (eds) *Systems under indirect observation: Causality, structure, prediction*, Amsterdam, North-Holland, pp. 1–54.
- Xu, H. (2007) 'The Effects of Self-Construal and Perceived Control on Privacy Concerns', *Twenty Eighth International Conference on Information Systems*. Montreal, pp. 1–14.
- Xu, H., Parks, R., Chu, C.-H. and Zhang, X. L. (2010) 'Information Disclosure and Online Social Networks: From the Case of Facebook News Feed Controversy to a Theoretical Understanding', *Proceedings of the Sixteenth Americas Conference on Information Systems*, Lima, pp. 1–9.
- Xu, H., Teo, H. H., Tan, B. C. and Agarwal, R. (2012) 'Effects of Individual Self-Protection, Industry Self-Regulation, and Government Regulation on Privacy Concerns: A Study of Location-Based Services', *Information Systems Research*, vol. 23, no. 4, pp. 1–22.
- Xu, J., Benbasat, I. and Cenfetelli, R. T. (2014) 'The Nature and Consequences of Trade-Off Transparency in the Context of Recommendation Agents', *MIS Quarterly*, vol. 38, no. 2, pp. 379–406.
- Yang, K.-C., Huang, C.-H. and Tsai, C.-W. (2015) 'Applying Reinforcement Theory to Implementing a Retargeting Advertising in the Electronic Commerce Website', *Proceedings of the 17th International Conference on Electronic Commerce*. Seoul, pp. 1–5.

- Yeo, J., Kim, S., Koh, E., Hwang, S. W. and Lipka, N. (2017) 'Predicting Online Purchase Conversion for Retargeting', *Proceedings of the Tenth ACM International Conference on Web Search and Data Mining*. Cambridge, pp. 591–600.
- Yi, C., Jiang, Z. J. and Zhou, M. (2014) 'The Effects of Social Popularity and Deal Scarcity at Different Stages of Online Shopping', *Thirty Fifth International Conference on Information Systems*. Auckland, pp. 1–16.
- Yu, J. H. and Cude, B. (2009) '“Hello, Mrs. Sarah Jones! We recommend this product!” Consumers' perceptions about personalized advertising: comparisons across advertisements delivered via three different types of media', *International Journal of Consumer Studies*, vol. 33, no. 4, pp. 503–514.
- Zarouali, B., Ponnet, K., Walrave, M. and Poels, K. (2017) '“Do you like cookies?” Adolescents' skeptical processing of retargeted Facebook-ads and the moderating role of privacy concern and a textual debriefing', *Computers in Human Behavior*, vol. 69, pp. 157–165.
- Zhang, B. and Xu, H. (2016) 'Privacy Nudges for Mobile Applications: Effects on the Creepiness Emotion and Privacy Attitudes', *Conference on Computer-Supported Cooperative Work and Social Computing*. San Francisco, pp. 1676–1690.