5th Meeting of
AG MARKETING

23rd-24th of November 2023,
virtual

Program Committee: Friederike Paetz, Raoul Kübler

Call for Abstracts

5th Meeting of
AG MARKETING
23rd - 24th of November, 2023 (virtual)

Invitation:
We cordially invite abstracts from scholars and practitioners in the field of quantitative marketing!

Purpose:
The AG MARKETING invites methodological, theoretical, or empirical papers that aim to contribute to the understanding of quantitative marketing issues. This call is not limited to any specific field of marketing and welcomes quantitative contributions in areas like *innovation management*, *sales management*, *pricing*, *advertising*, *market segmentation*, *digital marketing*, *consumer behavior*, *sustainability marketing*, *revenue management* etc.
Interested researchers are invited to submit an abstract for virtual presentation. Abstracts will undergo a peer-review process. No fee will be charged for this virtual meeting, and all registered attendees may request a "confirmation of attendance" for their organization!

Date:
The working group meeting will be **virtually** held on **Thursday (morning), 23rd of November, 2023, and Friday (afternoon), 24th of November, 2023.**

Publishing options:
All accepted abstracts are published in the journal *Archives of Data Science, Series A.*
Furthermore, accepted presenters for the *5th Meeting of AG MARKETING* will have the opportunity to submit the final version as a full paper for the journal *Archives of Data Science, Series A*. Articles must be 10-14 pages using the provided style. Please submit the final paper directly to the journal and obtain the journal's guidelines for authors:
https://www.archivesofdatascience.org/journals/series_a/author-guidelines

Important Deadlines:
- **Abstract submission**: Please submit your abstract (in English, max. 500 words, plain text with 1-3 references) until **17th of October, 2023** via mail to agmark-workshop@tu-clausthal.de
- **Notification about acceptance**: until **31st of October, 2023**
- **Registration**: Please register via mail to agmark-workshop@tu-clausthal.de until **16th of November, 2023**.

We are looking forward to numerous exciting submissions and many new faces!
If you have any questions, please do not hesitate to contact us!

Kind regards,
Friederike (Paetz) and Raoul (Kübler)

Final schedule

Thursday, 23rd of November 2023		**Friday, 24th of November 2023**	
schedule	*event*	*schedule*	*event*
09:25	Come-together (open microphones)	14:55	Come-together (open microphones)
09:30 – 9:35	Welcome	15:00 - 17:00	Session B
09:35 - 11:30	Session A	17:00 - 17:10	Farewell/Announcements
11:30 - 11:45	Social interactions (open microphones)	17:10 - 17:15	Social interactions (open microphones)

Sessions

Thursday, 23rd of November 2023

BBB-link: https://webconf.tu-clausthal.de/rooms/doa-tqa-tes-dyo/join

Session A (Chair: Marcel Lichters)

- Conjoint analysis on charging tariffs for EVs (*Dustin Sperling, Richard Woeste, Peter Letmathe*)
- Towards understanding patterns in museum attendance: Applying time series analysis to German museum panel data (*Lea Hildebrand, Friederike Paetz*)
- Nudge or Necessity? Exploring the Effects of Shopping Nudges along the Consumer Journey *(Bernhard Winter, Christina Schamp, Nadine Schröder, Thomas Reutterer*)
- Determinants for voice shopping via digital voice assistants: An empirical study (*Friederike Paetz, Carsten D. Schultz)*

Friday, 24th of November 2023

BBB-link: https://webconf.tu-clausthal.de/rooms/doa-tqa-tes-dyo/join

Session B (Chair: Winfried J. Steiner)

- Measuring Technology Acceptance over Time by Online Customer Reviews Based Transfer Learning (*Daniel Baier, Andreas Karasenko, Alexandra Rese*)
- How much to tell your customer? – A survey of three perspectives on selling strategies with incompletely specified products (*Jochen Gönsch)*
- Capacitated Assortment Optimization under the Mixed Multinomial Logit Model *(Oliver Vetter, Niloufar Sadeghi, Cornelia Schön)*
- When and where should the government advertise for support of its anti-pandemic actions (*Lina Welke, Raoul Kübler, Koen Pauwels)*

Abstracts

Session A

Conjoint analysis on charging tariffs for EVs

Dustin Sperling, RWTH Aachen
Richard Woeste, RWTH Aachen
Peter Letmathe, RWTH Aachen

Electric vehicles are becoming increasingly popular. As the number of electric vehicles increases, so do the requirements for a reliable charging infrastructure. Current implementations do not always meet these complex requirements. For example, an average of 18% of public charging operations in Germany fail currently. Within the EMoT research project, a test center will be designed to address this issue. In the course of the project, user preferences for charging tariffs will be investigated. A particular focus is on the value attached to the accessibility of reliable charging infrastructure. Different tariff features are weighed against each other in order to determine the corresponding end-user benefits for different levels of tariff features (Backhaus et al. 2021). Finally, it will be determined which tariff features are of particular interest and what value is attached to the reliability of charging. The research questions are answered by conducting a discrete choice experiment, specifically a choice based conjoint analysis (CBC) (Baier and Brusch 2021). The results are evaluated using a hierarchical Bayes (HB) model (Allenby et al. 2005).

References:

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Towards understanding patterns in museum attendance: Applying time series analysis to German museum panel data

Lea Hildebrand, Ostfalia University of Applied Sciences
Friederike Paetz, Clausthal University of Technology

Visitor numbers are of superior importance when evaluating a museum's economic performance (Hildebrand, Paetz & Küblböck 2022). The ability to detect patterns in visitation is a crucial managerial issue when assessing previous museum performance. Aside from that, a sound understanding of temporal patterns in visitor numbers is even more fundamental for forecasting prospective visitation. However, only few research exists investigating museum attendance under explicit consideration of the aspect of time (see e.g. Cellini & Cuccia 2013; Cuffle 2018). This contribution aims to take up this research demand. The present study initially applies time series analysis to German museum panel data in order to contribute to a better understanding of the temporal distribution of museum attendance. Our study is based on panel data containing information on the attendance of 95 German publicly funded museums such as corresponding site information from 1999 to 2019. In a first step of data processing, we scrutinized the individual statistical properties of each time series in record for a systematic derivation of forecasting requirements. The analysis revealed a non-stationary nature for the great majority of examined time series and thereupon, the particular necessity of employing detrending transformations. In the next step, we evaluated and compared the forecast accuracy of four widely applied methods in time series modelling. With respect to the evaluation of several accuracy measures, we find rolling window forecasts yielding the best quality in visitor forecasting. Further investigations of the gathered accuracy measures and site data imply not to assume that dynamics in the respective museum location have an impact on the output of any of the applied forecasting technique. The talk aims to present primary study results and intends discussing methodical challenges in time series modelling due to the determined particularity of the underlying data set.

References

Cellini, R., Cuccia, R. (2013). Museum and monument attendance and tourism flow: a time series analysis approach. In: Applied Economics, 45, 3473-3482.

Cuffle, H. E. (2018). Rain and museum attendance: Are daily data fine enough? In: Journal of Cultural Economics, 42, 213-241.

Hildebrand, L., Paetz, F., Küblböck, S. (2022). Museales Performance-Measurement in Krisenzeiten [Performance measurement of museums in times of crisis]. Journal of Tourism Science, 14(2), 107-133. (in German).

Nudge or Necessity?
Exploring the Effects of Shopping Nudges along the Consumer Journey

Bernhard Winter (Vienna University of Economics and Business, Austria)
Christina Schamp (Vienna University of Economics and Business, Austria)
Nadine Schröder (Vienna University of Economics and Business, Austria)
Thomas Reutterer (Vienna University of Economics and Business, Austria)

In the domain of online shopping, retailers often use behavioral nudges such as time scarcity (e.g., x% off for a limited time), quantity scarcity (e.g., only a few items left), or social proof (e.g., most popular choices), to engage customers and increase sales. Despite their widespread use in marketing practice, previous research has primarily focused on isolated versions of specific nudges and compare up to only two distinct nudges in experimental lab settings, resulting in a limited view of the complex landscape of online shopping nudges (e.g., Howard and Kerin (2006), Hmurovic, Lamberton, and Goldsmith (2022)). Moreover, these studies study the influence of these nudges on the purchase phase of the consumer journey by exploring choices or willingness to purchase for specific products, whereas in practice the nudges are used along various stages of the consumer journey.
Our research tries to provide a comprehensive perspective on nudges in online shopping environments. Unlike prior studies that rely on short-term experimental data, our analysis combines conjoint analysis with real-world sales and campaign-specific data gathered from an international online shopping club in the fashion industry. The dataset on more than 100,000 customers, which spans over a period of a few years, allows us to uncover the effects of various nudges throughout the customer journey, revealing their various effects and how customer responses evolve over time.
Contrary to the common belief that nudges exert a consistent influence on online shoppers across all stages of the decision journey, our preliminary findings challenge this notion. Specifically, we discover that scarcity – in contrast to other nudges like social proof – has a detrimental effect on customers during earlier stages of the consumer funnel. It seems that whereas scarcity effects induce feelings of loss aversion for dedicated product decisions, these nudges provide negative signals in the consideration phase (e.g., clicking on an advertised campaign).
This crucial insight emphasizes the need to understand the temporal and situational dynamics of nudges. Recognizing how these influences transform as customers progress from awareness to post-purchase stages is vital for retailers and marketers aiming to optimize their nudge strategies and enhance the overall online shopping experience.

References

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Determinants for voice shopping via digital voice assistants: An empirical study

Friederike Paetz, *Clausthal University of Technology*
Carsten D. Schultz, University of Hagen

Nowadays, voice shopping, i.e., shopping via conversational interactions with digital voice assistants is on the rise (Halhauer & Klarmann, 2022). The digital voice assistants Amazon's Alexa, Apple's Siri, Microsoft's Cortana, Google's Assistant, and Samsung's Bixby are well-known and widely used. The interaction with digital voice assistants is done verbally with technical devices without haptic contact. Therefore, voice commands need microphones that must continuously monitor the environment and process all sound inputs via an active Internet connection. When voice assistants are placed within the personal environment, it raises questions about what is recorded from private conversations, how the collected information is used and protected, and whether the information is used to pursue business purposes.
So far, German customers are quite reluctant to voice shopping. This behavior may be traced back to Germans' privacy and security concerns. However, other factors that impact customers' attitude or behavioral intention to use digital voice assistants are less is known and researched so far. However, the knowledge of these determinants are quite important for an entrepreneurial understanding of customers to (subsequently) enter voice shopping. This, in turn, has significant impacts on entrepreneurial decisions towards specific business plans, e.g., the integration of voice commerce.
In our study, we rely on the well-known technology acceptance model (TAM) of Davis (1989) for determining the acceptance and use of digital voice assistants. In particular, we focus on the relevance of perceived privacy and safety risks as determinants to use digital voice assistants and investigate these concerns and the corresponding level of trust. We create several hypotheses from recent thematically related literature and test our model in an empirical study with 207 respondents. In particular, we conducted a variance-based structural equation analysis and used the R package plspm for partial least square modeling. The empirical results showed support for almost all hypotheses and support the proposed research model, thus, validating the corresponding extension of the TAM. For example, we found that safety and privacy risks actually emerged. Furthermore, trust positively forms the attitude towards the technology and subsequently creates users' intention to use and actual use of digital voice assistants.
We conclude that emerging technologies like digital voice assistants need a threshold level of trust. Since digital voice assistants lack visual clues, other means need to communicate trusthworthiness. For example, easy accessible and comprehensible information are key to strengthen customers trust. This may be accomplished by seals, policies or trusted third parties.

References

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Session B

Measuring Technology Acceptance over Time by Online Customer Reviews Based Transfer Learning

Daniel Baier, University of Bayreuth
Andreas Karasenko, University of Bayreuth
Alexandra Rese, University of Bayreuth

Online Customer Reviews (OCRs) are user-generated semi-formal evaluations of objects (brands, companies, products, services, technologies). They typically consist of a time stamp, a star rating (1 to 5 stars) of the evaluated object and – in many cases – a natural language comment that details the perceived strengths and weaknesses (Yang et al. 2019). Up to now, many methodological approaches have been developed and applied to analyze and aggregate OCRs as well as to improve products and services based on this knowledge (see, e.g., Decker and Trusov 2010; Rese et al. 2014; Yang et al. 2019; Hartmann et al. 2023). So, Rese et al. (2014) applied a lexicographic text mining approach similar to sentiment analysis to OCRs of IKEA's augmented reality app. They predicted construct scores for the extended technology acceptance model (TAM) and validated these predictions by an additionally conducted extended TAM survey among app users.

In this paper, we present a new transformers based approach for the same purpose. We train, test, and validate a transfer learning model based on large samples of OCRs and corresponding extended TAM construct scores given by experts. The results are promising. They go beyond conducting an extended TAM survey for an object by validly predicting the development of construct scores over time.

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How much to tell your customer? –
A survey of three perspectives on selling strategies with incompletely specified products

Jochen Gönsch, University of Duisburg-Essen

Today's technology facilitates selling strategies that were unthinkable only a few years ago. One increasingly popular strategy uses incompletely specified products (ICSPs). The seller retains the right to specify some details of the product or service after the sale. The selling strategies' main advantages are an additional dimension for market segmentation and operational flexibility due to supply-side substitution possibilities. Since the strategy became popular with Priceline and Hotwire in the travel industry about two decades ago, it has increasingly been adopted by other industries with stochastic demand and limited capacity as well. At the same time, it is actively researched from the perspectives of strategic operations management, empirics, and revenue management.

This presentation first describes the application of ICSPs in practice. Then, we introduce the different research communities that are active in this comparably new field and relate the terminology they use. In Strategic Operations Management, Jiang (2007) is one of the first authors who considers selling ICSPs. Regarding empirics, research started with Granados et al. (2008) who analyze the prices posted for regular and opaque airline tickets with a special focus on the price difference. In operational Revenue Management, one of the first authors is Talluri (2001).

The next part is an overview of the literature on selling ICSPs from the different perspectives. Here, we complement a tabular overview with an introduction into the community. Finally, possible directions for future research are outlined.

We see that strategic operations management has described advantages of ICSPs over other strategies in a variety of settings, but also identified countervailing effects. Today, empirical research is confined to hotels and airlines and largely disconnected from the other perspectives. Operational papers are ample, but mostly concerned with the availability of ICSPs. Research on operational (dynamic) pricing is surprisingly scarce.

References:

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Capacitated Assortment Optimization under the Mixed Multinomial Logit Model

Oliver Vetter (Business School of Mannheim)
Niloufar Sadeghi (Business School of Mannheim)
Cornelia Schön (Business School of Mannheim)

A key strategic decision for any company is the positioning and design of its product line. It is concerned with questions like "How many products to offer?", "Which products to offer?", and "How to differentiate and price the products in our line?". On the one hand, the implementation of product line decisions, like introducing new or redesigning existing products, is typically very costly. On the other hand, product line decisions determine the market success of the company. Only with a sufficiently differentiated product portfolio, diverse customer needs can be satisfied, and additional customers may be attracted. The problem of finding the most profitable product line under customer choice behavior has been separately addressed in the product line design (PLD) as well as in the assortment optimization (AO) literature. The AO problem under the mixed multinomial logit (MMNL) demand model is NP-hard. Existing exact methods for AO problems are suitable for small instances but computationally inefficient when applied to larger real-world instances. These instances can only be tackled with heuristic methods. We present novel exact solution procedures, an approximation scheme, and heuristic methods to solve the capacitated AO problem with discrete pricing under MMNL demand. We contribute to the existing literature in the following ways:

- We improve the state-of-the-art approach of Şen et al. (2018) by adopting valid constraints from Méndez-Díaz et al. (2014) and applying a B&C technique. Computational tests show that this enhancement solves our problem instances on average between 32 % - 56 % faster.

- We show that an FTPAS algorithm exists for the AO problem even if the discrete pricing decision is included. The algorithm is based on the work of Désir et al.(2022) with three changes. First, we include the pricing constraints. Second, we reduce the number of grid points by decomposing each fraction with a single variable (like in Shen, Zhang, & Wang, 2017). Third, we allow that the weights in the capacity constraints can have negative values which is a more general version of Désir et al. (2022). This allows the model to reflect situations where a lower bound on the capacity exists.

- We review the current PLD and AO literature and show that under two conditions, the PLD and the AO problem formulations are equivalent, such that their solution results in the same product line. In addition, we propose three heuristics. As GAs are prominently used across both literature streams, we apply two different versions of GAs. The first uses the AO model and the second uses the PLD model formulation. The third heuristic is a hybrid approach that takes advantage of both the PLD and AO formulations. We name this approach two-step, and the others GA-AO and GA-PLD, respectively. Then, we test in a numerical performance analysis of solution quality and time whether solving the AO problem formulation is advantageous over solving the equivalent PLD problem formulation with state-of-the-art methods, or vice versa. The heuristics and exact methods are tested on synthetical and seven real-world conjoint studies.

References:

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When and where should the government advertise for support of its anti-pandemic actions

Lina Welke Essec Business School, Paris, France
Raoul Kübler, Essec Business School, Paris, France
Koen Pauwels, Northeastern University, Boston

The COVID-19 pandemic, which began in Wuhan, China, has left an indelible mark on the world, with over 208 million infections and 4.3 million deaths. During the initial phase of the pandemic, when vaccines and antiviral medications were unavailable, governments implemented Non-Pharmaceutical Interventions (NPIs) to curb the virus's spread, ranging from border checks to complete lockdowns. While NPIs have been effective in reducing (Chiu, Fischer, & Ndeffo-Mbah, 2020) transmission, the associated economic and psychological impacts have sparked debate (Hale et al., 2021; Sukhwal and Kankanhalli 2022). This study addresses the debate around the psychological effects of NPIs, such as stress, anxiety, and depression, by examining emotional responses to these measures among different population groups in the United States during the early stages of the pandemic.

We rely on a set of transformer-based emotion classifier to assess emotions within tweets, including anxiety, fear, sadness, anger, joy, and surprise. Additionally, a self-tuned transformer model is employed to detect stress and depression levels in tweets. Interrupted time series models are used to analyze the impact of reaching Covid-19 awareness and implementing NPIs on various emotions for each city.

Using a unique dataset of over 50 million geolocated tweets from 45 major U.S. cities from December 2019 to June 2020, the study employs interrupted time series models (Ejlerskov et al. 2018; Cook 2008) to explore the impact of the COVID-19 pandemic and various NPIs on daily user stress and depression levels. The analysis also considers the moderating effect of the socio-economic context of each city to understand explain variance in emotional responses.

Our study finds that in general Covid19 is generally the largest stress driver. Once administrative entities decide on NPIs we observe a significant reduction in stress. We further find that the impact of NPIs on emotions varies across cities, with some showing large effects upon implementing lockdowns while others show no immediate response. Long-term emotional responses also differ, with some cities experiencing a decline in fear after NPIs were put in place, challenging the notion that lockdowns universally negatively affect emotional well-being. The effects on other emotions show similar idiosyncrasies, highlighting the need for a deeper understanding of the socio-economic factors contributing to these variations.

The results provide valuable insights for policymakers, healthcare professionals, and communication managers, enabling them to better plan and forecast emotional responses among specific population groups when implementing NPIs. Our findings indicate that especially wealthier, more educated and whiter neighborhoods showed stronger negative reactions to NPIs, while poorer, less educated, and economically challenged areas, do not show significant changes in stress and well-being. Finally, we find that areas with higher levels of vulnerable citizens, which share higher levels of medical pre-conditions, similarly show more stressed reactions at the beginning of the Covid19 pandemic, but ultimately show a significant decrease of stress, once NPIs are enacted.

Our study's findings underscore the need for a nuanced understanding of how NPIs affect emotional well-being, emphasizing the importance of considering socio-economic factors in future planning and decision-making.

This research contributes to a more comprehensive understanding of the psychological impact of NPIs during a public health crisis, highlighting the need for tailored strategies to address the emotional well-being of different population groups.

Further investigations are required to explore the socio-economic nuances and contingencies that explain the variations in emotional responses to NPIs, with the goal of providing more targeted support and care in future crises.

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