List of Special Sessions

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[NOTE]

- Authors who are interested in a certain special session must choose it when submitting an abstract.
- Every special session is planned to have a special issue in a high-quality journal, even though some are still under negotiation.
- Authors of accepted abstracts will be invited to submit a full paper, which will be further reviewed and potentially published in a corresponding journal.

Welcome your contribution!

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SPECIAL SESSION

1

Advanced Models in Practice

Session organizers: Greg Spitz and Stephane Hess [*]

While academics are continually trying to improve models, actual real-world decisions need to be made by applying models right now: demand must be estimated, policies must be developed, plans made, and projects built. Ideally, the best demand behavioural models will be used for such decision making. However, we know that real world problems often do not nicely fit the structures of advanced academic behavioural models in practice.

This session will focus on where practitioners have been able to solve complex and difficult problems using advanced models effectively and creatively to solve real problems applying the best techniques possible. The session hopes to inform both academics and practitioners of what modelling issues need to be improved (or solved) and what methods are best for applying state of the art models in ways that work in real situations.

For example, there is significant literature now on estimating hybrid models, but how are those models applied effectively on actual projects? The same goes for models incorporating other complex patterns of heterogeneity. Do these added layers of model difficulty translated into real world benefits, especially in long term forecasts?

Another recent example are studies using a "shopping cart" or "basket" choice, where multiple discrete and continuous choices can be made. This sounds like a perfect situation for MDCEV models, one would think. However, often at least one choice in a shopping cart is an "all-you-can-eat" option. This option nullifies the budget function of the MDCEV, as there are no marginal costs to additional consumption under an all-you-can-eat alternative. Examples of all-you-can-eat versus a-la-carte options are numerous in real market places, including the all-you-can-eat buffet; the monthly (or seasonal) transit pass; various internet services offering unlimited numbers of songs, movies, etc. to name just a few. In each of these examples, the ability to purchase these products and services a la carte is also possible, making this a very common and thorny modelling concern that practitioners are encountering daily. Similarly, reduced unit cost with multiple purchases (even if not capping the total cost) poses problems for such models. To deal with this problem, some practitioners have employed a brute force approach that allows for understanding the choice between the total combinations of a-la-carte alternatives versus an all-you-can-eat alternative (often constrained to be tractable by some reasonable assumptions). This can require models with tens of thousands of potential alternatives.

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At the data end, applied work relies very extensively on hypothetical (stated preference) data. While such data is commonly used in academic work for model development or for understanding relative sensitivities, practical work also uses such data for long term forecasting, and it is not always clear whether that is acceptable.

This session's intent, then, is to find creative solutions in practice that can be examples of issues that need to be solved ultimately by academics, or at least improved. It is also meant to show examples of techniques developed by sophisticated practitioners that academics might want to use themselves to better forecast and understand behaviour. It's also a session for academics to help practitioners understand better methods to apply their advanced techniques. Ultimately, it is meant to help further the research and application of behavioural choice models to create better decisions in the real world.

Research topics include, but are not limited to:
- Creative applications of advanced choice models (e.g., how hybrid models have been used in practice, examples of discrete-discrete models, all you can eat vs. a la carte solutions).
- Fitting academic theory into something practical
- Taking practice and making it academic—how can we learn from what decision makers are demanding?

SPECIAL ISSUE

A corresponding special issue will be in the Journal of Choice Modelling.

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SPECIAL SESSION

2

Choice Modelling in the Global South

Session organizers: Charisma Choudhury[*], Matthew Quaife, Abdul Pinjari

Motivation

There are significant differences in behaviours between the developed and the middle and low-income countries in the Global South. These make it unreasonable to transfer data collection and model frameworks formulated in the context of developed countries to the regions of Global South. For example, recent research in the context of low-income countries has revealed that stated-preference data collection is complicated in practical terms with language and literacy leading to the introduction of pictorial representations of attributes; the 'noisiness' of the revealed-preference (RP) data has led to use of more complicated frameworks, etc. Further, the research questions of interest are often also very different in the countries of the Global South.

However, to date there is marked difference in the volume and rigour of Choice Modelling research done in the context of the Global South compared to the developed countries. This is in spite of the fact that in terms of population as well growth rate – the countries in the Global South have a larger impact in resource consumption and investments.

Scope

This special session will address these research gaps with particular focus on transferability of lessons learnt across different disciplines (e.g., environment, health, marketing, transport, etc.) and promises offered by the advent of passive data sources.

Research topics include, but are not limited to the following:
- Challenges in data collection in the context of developing countries
- Opportunities offered by secondary and/or ubiquitous data sources
- Methodological issues in model development (e.g. originating from the noisiness of the data, high variability in the choice environment, etc.)
- Inferring preferences and choice-set from highly censored data (e.g. can we infer the choice patterns of a consumer who makes a purchase once a year)?
- Differences in decision-making rules, attribute processing strategies, etc. across different countries and transferability of models across countries in the Global South
- Cross-fertilization of ideas from different disciplines
- Choice modelling and prediction in real-time situations (e.g. ride-hailing fleet operator needs to predict in real-time what a consumer might do)

SPECIAL ISSUE

A corresponding special issue will be in the Journal of Choice Modelling.

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SPECIAL SESSION

3

Choice Modelling in Informed Patient Choice in Healthcare

Session organizers: Michiko Moriyama [*], Paul Lillrank

Health expenditure in the rich world has for decades been growing faster than economic output. The gap between what is medically possible and what society can afford will broaden. Policy makers need to find ways to define, produce, deliver and finance health services and technologies in a sustainable way.

Advances in education, information and communication technologies, and social media have contributed to change the role of patients from passive recipients to empowered customers. Health service production is increasingly defined as 'co-creation of health'. Simultaneously research indicates that many patients are confused and overwhelmed by the options presented to them. Informed patient choice (IPC) is defined as a choice made by a reasonable individual with autonomy, based on relevant knowledge, consistent with the decision maker's values, and behaviorally implemented. Patient decision aids (PtDAs) have been developed, but their implementation appears to be more difficult than expected.

There is an increasing awareness that the choices faced by patients and their families, care managers, service producers, financiers, and technology developers, are not easily described following a singular formula. Choices are contextual. It stands to reason that the choice situations in, say, emergency, preventive, and long-term care are different. Clinical decisions aiming at restoring a person's health are by necessity different from the care decisions at end-of-life situations where the aim is to arrest inevitable decline and maintain a reasonable quality of life. To develop meaningful choice models there is a need for segmentation models that could define basic choice contexts, as well as different types of capabilities and preferences held by a chooser. Health service researchers could benefit from insights in other walks of life, such as individuals' decisions on their personal finances, housing and living arrangements, educational opportunities, and post-retirement life.

We welcome papers that address the above issues from various perspectives, and using a variety of methodologies and methods, conceptual frameworks and empirical research, qualitative and quantitative data, experiments and modeling. We are particularly interested in attempts to apply choice modelling principles and techniques developed in other industries to the problems in health service production.

SPECIAL ISSUE

A corresponding special issue will be in an SCI/SSCI-indexed health journal (under negotiation).

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SPECIAL SESSION

4

Energy and Environmental Decision-making

Session organizers: Biying Yu[*], Junyi Zhang, Yi-Ming Wei, Gaetano Grilli, Silvia Ferrini

Energy consumption behaviors directly or indirectly affect ecosystems and energy productivity relies on ecosystems conditions and availability (e.g. water for hydropower). The dependency and pressures of economic development on natural capital is getting a prominent role in many regions in the world, where people have to depend on multiple natural resources for their survivals. The transition to a sustainable society needs to tackle multiple challenges, among which individual and organizational behaviors are at the core. Decisions in energy and environment involve interdisciplinary and cross-sectional aspects. They range from choosing among the multitude of strategies available to conserve energy, mitigate and adapt to climate change, reduce pollutant emissions, and improve the management of natural capital as well as institutional transition to different arrangements among governments, businesses, and people. Thus, it is also crucial to involve various stakeholders and sectors, accommodate various time and space horizons, and uncertainties coming from human beings, technological development, social system, institutions and so on, to better inform energy and environmental policymaking.

This special session aims to enhance our understanding of individual and organizational behaviors and decision-making processes related to energy consumption, greenhouse gas and pollutants emissions, climate change, and ecological sustainability. It also generates methods to frame and analyze the important decisions regarding energy transition for protecting ecosystems and the environment. It calls for papers addressing, but not limited to, innovative choice modeling developments and empirical analyses in the following fields.

- energy consumption behavior in industrial, commercial, transport and residential sectors
- human decisions addressing the relationships between energy transition and ecosystem services
- the role of ecosystem in decisions on human activities that affect energy consumption
- behavioral research on air quality, water quality, land use
- decision making mechanism for emission trading system
- behavioral research on impacts of new social issues or technological development trends (e.g., aging society, smart technologies such as electric vehicles, internet of things, artificial intelligence) on energy and environment
- energy demand management decisions
- energy efficiency choice
- climate change mitigation and adaptation behaviors
- ecosystem services in human decision making
- natural capital and ecosystem services accounting

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- environmental attitude and ecological behavior
- behavioral changes in energy consumption via lifestyle transformation (or smarter life choices), technological transition, and/or economic transition
- policy interventions and behavioral changes toward environmental sustainability
- sustainable lifestyle decision making
- valuation of environmental goods and services in consideration of nature-human benefits exchange

This special section calls for papers targeting the key research issues and mechanisms during the decision process of various stakeholders. Apart from applying existing developed or well-known models to new empirical applications, we invite submissions that can improve the theories and computational methods or propose new methods needed to evaluate energy and environmental policies, and to make robust decisions based on outcomes. We also welcome the application of smart technologies for data collection, such as Big Data. Interdisciplinary analysis across economics, psychology, physical sciences, energy technologies, computational mathematics, statistics, and computer science is encouraged.

SPECIAL ISSUE

A corresponding special issue will be in an SCI/SSCI-indexed journal (under negotiation), in the fields of energy, environment and ecosystems.

SPECIAL SESSION

5 Hybrid Choice Models

Session organizers: Petr Mariel, Jürgen Meyerhoff[*]

Hybrid choice models (HCM) have recently been increasingly used in non-transportation fields, such as environmental economics, food choice. Main motivations for employing HCMs are generally to a) bypass problems with endogeneity when, for example, attitudes are incorporated in choice models, and b) to get deeper insights into peoples' preferences, their heterogeneity and the underlying determinates such attitudes and norms. While the use of HCM has significantly increased beyond transportation, we would argue that the debate about the usefulness and conditions that have to be met has not found a comparable resonance beyond transportation.

Apart from applications in different fields, the debate about the suitability of the HCM has mainly be attached to transportation. A pointed criticism of the HCM was presented by Chorus and Kroesen (2014). They argue that in a HCM, the latent variable is generally endogenous to the travel choice, and that the cross-sectional nature of the latent variable does not allow for claims concerning changes in the variable at the individual level. Taking this criticism, among others, as a starting point, Vij and Walker (2016) discuss when and why hybrid models might be useful. They present important theoretical findings regarding the HCM and systematically evaluate the benefits of the HCM framework. They find the statistical benefits of the HCM to be smaller than previously believed. Mariel & Meyerhoff (2016) using, however, data from the environmental field, contributed to it discussing, among other things, whether the additional insights gained from HCM justify the increased effort for estimating these models. However, while the popularity seems to be still rising, the when and why questions raised by Vij and Walker have gained less attention.

The objectives of this special session are therefore twofold. First, following the session devoted to HCM at the ICMC in Austin, Texas in 2015, (Workshop: 'Behavioral' choice modelling: Much ado about nothing? led by Caspar Chorus & Stephane Hess), we want to gather the current state of art and application as many studies have been published since the ICMC in 2015. Second, the session aims at a cross-disciplinary discussion about conditions and usefulness of HCM. This way, we want to contribute to avoiding that insights and knowledge are not accounted in other fields of potential applications and help to create a basis for mutual learning.

SPECIAL ISSUE

A corresponding special issue will be in the Journal of Choice Modelling.

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SPECIAL SESSION

6

Machine Learning and Spatiotemporal Choice Modelling

Session organizers: Bilal Farooq*, Seyedehsan Seyedabrishami, Taha Rashidi, Melvin Wong, Rolf Moeckel

Choice modelling has traditionally been hypothesis-driven where data were primarily used to evaluate variety of hypotheses. In the context of scarcity of data, cost of observing certain behaviors both in field and laboratory settings, and small sizes of available datasets this approach gave us strong tools to understand and model complex human behavior in terms of mobility, population evolution, and urban systems. The exponential growth of information and communication technologies as well as data-driven services and sharing economy are fundamentally altering the landscape of choice modelling. New ubiquitous data-collection technologies are now readily employed to gather large volumes of behavior data in a non-invasive manner. Ride-hailing, short-term online room-rental, online shopping, crowdsourced delivery, mobility as a service, connected and autonomous vehicles, virtual and augmented reality, and other new services are generating tremendous amount of rich data on human behavior.

Machine learning is a data-driven approach that is designed to take full advantage of the size, richness, and spatiotemporal scale of the new ubiquitous data sources with no need for any data reduction techniques. The potential of machine learning methods has not yet been extensively explored in choice modelling, mainly due to its perception as unintuitive or seen as a 'black box' technology. To address these issues and explore the potential, we propose a special session at ICMC2019 that covers a range of methodological issues and applications. In particular we invite original research contributions to address following or relevant issues:

- Emerging behavioral theories and concepts inspired from machine learning that can be used for spatiotemporal choice modelling
- Investigation of the explainability of machine learning models in the context of choice modelling
- Improvement of the predictive accuracy of choice models with machine learning while maintaining interpretability
- Behavioral plausibility of long-term forecasting and policy making using machine learning based choice modelling
- New model estimation techniques inspired from machine learning
- Use of machine learning for protection against biased/diverging opinions from the speed of information dissemination
- Privacy preserving in highly granular learning models
- Use of new and unconventional variables and data sources in modelling choice behavior
- Modelling choice behaviors that affect mobility and population evolution

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- Integrated models and formulations to account for correlation and causalities among long-term and short-term choices
- New microsimulation platforms for replicating the choice behavior of agents in urban/rural/regional contexts

This special session covers the research related to Big Data, shared economy, autonomous vehicles, Artificial Intelligence, Internet of Things, and also topics like interdependent choices across life domains and choice behavior over time. We expect a strong interest in the session as machine learning and artificial intelligence are starting to attract interest from the choice modelling community.

SPECIAL ISSUE

A corresponding special issue will be in an SCI/SSCI-indexed journal (under negotiation).

SPECIAL SESSION

Models of Moral Decision Making

7

Session organizers: Caspar Chorus[*], Jürgen Meyerhoff, Ulf Liebe

Discrete choice theory (DCT) provides a mathematically rigorous framework to analyse and predict choice behavior; since being introduced forty-five years ago, it has enabled sophisticated empirical analysis of decision making in fields as diverse as Transport, Energy & Environment, Sociology, Health, Marketing, and the Political Sciences. Over the last decades, choice models have become ever more advanced, allowing modellers to capture a variety of subtle behavioral phenomena.

Notwithstanding these great accomplishments, much works needs to be done, before DCT can be considered a complete theory of choice behavior. This special session / special issue starts from the observation that DCT has a blind spot for moral choice behavior; it was designed to analyse situations where people make choices that are optimal given their consumer preferences, rather than situations where people attempt to make choices that are right, given their moral preferences.

This neglect of the morality of choice is striking, in light of the fact that many of the most important choices people make, have a moral dimension. Our special session / special issue aims to help fill this gap by proposing and empirically testing mathematical models that aim to capture human decision making behavior in moral choice situations; this presents a much needed first step towards extending the reach of discrete choice theory to the domain of moral decision making.

Research topics of interest include, but are not limited to, models and empirical analysis concerning:
- Norm formation and its effect on choices;
- Altruistic and pro-social behaviour;
- Anti-social behaviour, deceit, obfuscation, taboos;
- Guilt, shame, remorse as determinants of choice behaviour;
- Decision-making in moral dilemmas;
- (social) Context effects on moral choice behaviour.

This special session is heterodox: apart from a generic ambition to present and publish high quality submissions, we hold no a priori dogmas concerning what is a moral choice situation and what not; what is the right way to model moral decision making; what are the right kind of data to validate models; what application domains are interesting; etc. In other words: we invite submissions proposing completely new models as well as submissions which extend or apply previously developed or well-known models; we are interested in receiving theoretical, methodological, and data-centred contributions; we welcome models estimated on stated

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choice data, revealed choice data, and other kinds of data (e.g. experiments based on induced preferences, or neuroscience-based experiments).

Importantly, we encourage contributions from the classical application domains of DCT but perhaps even more so from less explored areas such as Sociology, Political Science, Healthcare, Criminology, etc.

Authors of accepted abstracts (submitted to this special session at the ICMC2019) will be invited to submit a full paper which will be reviewed and potentially published in a corresponding special issue at the Journal of Choice Modelling.

To get a rough idea of how moral decision making can be modelled and analysed using tools from the choice modeller's toolbox, here is a selection of recent papers with a full or partial focus on moral choice models, co-authored by the organizers of this call:

Andorfer, V. A., & Liebe, U. (2015). Do information, price, or morals influence ethical consumption? A natural field experiment and customer survey on the purchase of Fair Trade coffee. Social Science Research, 52, 330-350.

Chorus, C. G. (2015). Models of moral decision making: Literature review and research agenda for discrete choice analysis. Journal of Choice Modelling, 16, 69-85.

Chorus, C. G., Pudāne, B., Mouter, N., & Campbell, D. (2018). Taboo trade-off aversion: A discrete choice model and empirical analysis. Journal of Choice Modelling, 27, 37-49

Liebe, U., Meyerhoff, J., Kroesen, M., Chorus, C.G., Genk, K., 2018. From welcome culture to welcome limits? Uncovering preference changes over time for sheltering refugees in Germany. PLOS ONE, 13(8): e0199923

Liebe, U., Mariel, P., Beyer, H., Meyerhoff, J., 2018. Uncovering the Nexus Between Attitudes, Preferences, and Behaviour in Sociological Applications of Stated Choice Experiments. Sociological Methods and Research (in press)

This call is supported by the **BEHAVE-program** (sponsored by an ERC-Consolidator grant) which develops and tests moral choice models. See http://behave.tbm.tudelft.nl for more information about BEHAVE.

SPECIAL ISSUE

A corresponding special issue will be in the Journal of Choice Modelling.

SPECIAL SESSION

8

Tourism Behavior and Decision Making

Session organizers: Honggang Xu[*], Linghan Zhang

Tourist related travelling has become as one of the most important travelling demands globally. Tourist travelling reveals more diversities and more dynamics. Different from daily trip making, tourists have more interactions with the environment and generate more affective experience during the whole travel. Even during use of the same transportation modes that are often used in daily life, tourists may experience more positive emotions. But there are also similarities between daily trip making and tourism. For example, decisions on tourism behaviors also involve a number of interdependent choices that are made over time and across space, including trip generation and frequency, travel party, destination, travel mode and route, activity participation and time use, etc. However, special features of tourism suggest that its decision-making rules/mechanisms may be different largely from daily trip making. Subjective aspects become more important, such as tourists' values, personality, motivations, expectations, attitude, perception, satisfaction, trust, and loyalty. Tourism affects personal feelings and emotions and is closely related to people's higher-ordered quality of life.

Tourism activities cost more than daily leisure activities, and therefore, tourism is less frequent. Tourism consuming behavior is a kind of emotion-based behavior with thorough consideration and involving impulse purchases. Because the tourism spending is larger, its decisions may need to pay more attention to the tradeoffs with other daily-life expenditures.

Although traveling in short period, tourists expect more experiential activities such as sightseeing, wellness, sports, and cultural activities. This suggests that tourism decisions may involve more interactions between different decisions. And transport accessibility to/within destination areas becomes more important. In recent years, with the increasing use of GPS-enabled smartphones and more and more tourism information on the Internet, tourists' choices

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are changing. For capturing the above behaviors and decision making, the geographical contexts in which the travelling occurs also need to be considered. For instance, many route choice and mode choices are to be done inside the environmentally fragile areas where certain attractions have to be visited. All the above statements suggest that better understanding of tourism behaviors and decision making needs more interdisciplinary research. However, existing efforts are still very limited. Furthermore, impacts of new trends (e.g., smart technologies, aging society) on tourism have left unknown.

With the above considerations, this special session calls for innovative studies to fill, but not limited to, the above research gaps. Multiple survey and modeling approaches are encouraged: experimental surveys, statistical models, econometric models, behaviorally-oriented choice models. Data-driven modeling approaches (e.g., Big Data). Qualitative research methods are also welcome.

SPECIAL ISSUE

A corresponding special issue will be in the journal "Tourism Geographies" (SSCI).

SPECIAL SESSION

9 Unravelling Choice Set Compositions in the Era of Large-Scale Revealed Preference Data

Session organizers: Shlomo Bekhor[*], Oded Cats, Danique Ton

Choice set formation is a key element in behavior research, as the size and composition of these sets largely influence model estimation, interpretation and prediction. In the past, many researchers have addressed this topic, especially concerning choices that contain many potential alternatives, such as residential choice, itinerary choice, partner and purchase choices. Large-scale pervasive data collection such as location based apps, GPS and Wi-Fi sensors, credit card transactions, smartcards and online searches and acquisitions, offer access to unprecedented amounts of individual and often longitudinal revealed preference data.

These advancements allow identifying historical choice-sets based on observed past choices. Different methods have been proposed in literature that reduce the universal choice set to a potential considered choice set by explicitly enumerating alternatives. Often, these methods are based on heuristics, availability, and feasibility. Large-scale choice data offers another approach for forming to the choice set, namely based on behavior and experience.

Past choices might be used to tailor the provision of alternatives in future choice making situations. Increasing research and development efforts are devoted to customizing the alternatives offered to individuals based on past choices using data analytics, machine learning techniques and artificial intelligence capabilities. This includes e-commerce services, social media, online tourism, travel services and dating services. Furthermore, these developments can enable the provision of information that is tailored to individual user profiles based on historical behavior.

The formation of the choice set impacts model estimation, interpretation and prediction. The aim of this special session is to investigate the opportunities and advancements made in this new era of large-scale choice data in the context of choice modelling.

Research topics include, but are not limited to:
- Choice set formation in recommender systems (e.g. travel websites, Amazon)
- Learning and customization in choice modelling
- Historical and habitual choice-sets
- Multi-dimensional decision-making (i.e. combined choices of two or more behaviors)
- Travel behaviour decisions with a large number of alternatives (e.g. route choice or (multimodal) mode choice)

SPECIAL ISSUE
A corresponding special issue will be in the Journal of Choice Modelling.

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