



Book of abstracts

Quantitative methods in the digital turn: Promises and pitfalls

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MONDAY, JUNE 02, 2025

WORKSHOPS 1: COMPUTATIONAL THINKING AND SOCIAL SCIENCES: A CRASH COURSE

Matti Nelimarkka (University of Helsinki & Aalto University, Finland); Matti is university lecturer and head of the social computing group at the University of Helsinki, Finland. He studies and teaches how digitalization changes out societies – including our research methods.

This engaging workshop offers a comprehensive introduction to the fundamental components of computational thinking and programming, tailored specifically for social scientists. Participants will explore key programming concepts, including variables, if-statements, and for-loops, while gaining a deeper understanding of how programming involves issuing precise commands that a computer executes step-by-step. We therefore train how social scientists can translate their research questions into computational problems that a computer can effectively address; thus trying to find a balance between more advanced methods and more substantive social science questions. Moving beyond foundational programming skills, the workshop explores how to bridge computational methods to usual social science methods. Therefore, we quickly explore practical applications of machine learning in analyzing survey data and focus on data scientists' strategies to enhance accuracy and predictability in their models; discussing how such strategies can be applied in social science questions. The course is inspired by the workshop organizers' book "Computational Thinking and Social Science" (SAGE, 2022), and is designed to be accessible to individuals with no prior experience in programming languages such as R or Python. Join us to unlock the potential of computational thinking in your research endeavors and gain valuable skills to navigate the digital landscape of social science.

AI-based visual stimuli as a promising measurement tool in surveys? Insights from a survey experiment

Knut Petzold (Zittau/Goerlitz University of Applied Sciences, Germany), Markus Kreuzberger (University of Salzburg, Austria), Katharina Stiebler (University of Salzburg, Austria), Bernhard Reicher (University of Salzburg, Austria)

Visual stimuli, such as photos or AI-generated images, are increasingly used in surveys to measure judgments, attitudes, or decisions. Image-based stimuli are assumed to better avoid systematic measurement errors compared to conventional item-based measurement due to the standardized presentation of information and respondents' consistent retrieval of relevant information from memory. New image generators based on artificial intelligence provide a powerful tool to create realistic visual stimuli. Visual stimuli in the form of objects, people, or scenarios can be generated quickly and easily, while researchers have a certain control over variations. However, initial studies suggest that images are often recognised as AI-generated, especially when depicting portraits. This raises the question of how AI-generated images are perceived and whether measurements are biased according to whether respondents are aware of the AI origin or not. We use a split ballot survey experiment to investigate the effects of knowing / not knowing the AI-origin of presented portraits on attributed characteristics according to the Stereotype Content Model. Half of the respondents were informed a priori that the portraits presented had been generated using AI. The other half of the respondents were asked a posteriori whether they thought the portraits were photos or AI-generated images. The results show that the measured attributes do not differ significantly according to the explicit knowledge of the AI origin. However, the detection rates vary considerably across

the different portraits, indicating perceived fictionality. We discuss potentials and pitfalls of using AI-generated images in surveys and derive methodological implications.

Big Dilemmas, Little Time: Intergenerational climate justice and public support for deep decarbonization

Manuele Citi (Copenhagen Business School, Denmark), Zhen Im (LUT University, Finland) This paper explores how knowledge about the distributive effects of climate change across generations affects support for green policies that reduce carbon emissions but simultaneously dampen wages. To tackle Climate Change, governments in advanced economics propose green policies that often entail a trade-off between environmental and economic priorities. For workers, they may be confronted with a similar trade off when deciding whether to support green policies – namely, should they support green policies when it may entail economic costs like wage loss. Our contribution to this debate is that knowledge about these intergenerational distributive effects may dampen this trade-off confronted by workers. Specifically, future generations bear the bulk of the burden of Climate Change that arise from the actions of previous and current generations, because the environmental effects from Climate Change worsen over time. We propose that receiving direct information about these intergenerational effects causes individuals to support front-up green policies which yield greater cuts in emissions at the expense of higher wage loss. We test this mechanism using a recent survey experiment conducted in 10 countries.

The Impact of Gender-Inclusive Language on Response Behavior Evidence from a survey experiment on authoritarian attitudes in Austria

Wolfgang Aschauer (University of Salzburg, Austria), Knut Petzold (Zittau/Goerlitz University of Applied Sciences, Germany), Markus Kreuzberger (University of Salzburg, Austria)

The use of gender-inclusive language in German surveys has increased, but its effects on response behaviour remain underexplored. Recent research shows that gender-fair language does not impair data quality compared to masculine generics but slightly increases response times (Neuert, 2024), and that the gender star form promotes stronger female mental representations, while the generic masculine reinforces male-dominated perceptions (Körner et al., 2022). The acceptance of gendered language also correlates with political attitudes (Jäckle 2022). Building on this evidence, we conducted an online survey experiment (in May 2024, n= 431) in Salzburg on ideology and authoritarian attitudes. Participants were randomly assigned either a gendered or ungendered questionnaire. Twenty-one items, related to social integration, authoritarianism and group-focused enmity, were presented in either gendered or ungendered language. We hypothesize that differences in agreement only appear in response to sensitive items (e.g., "Führer" vs. "Führungspersönlichkeit"), while response times vary across gender and political ideology. Indeed, differences in judgments emerge only for politically sensitive terms or when both genders are explicitly mentioned. Among men who complete the survey within a reasonable timeframe, the gendered version increases response time, whereas male satisfiers respond even faster. Women show no differences. Similar effects appear among left- and center-aligned individuals but not among right-wing participants. Overall, our study suggests that gender-fair language does not negatively affect survey judgments, making it a viable option for inclusive survey design. However, it shapes mental representations differently across gender and political ideology, potentially increasing processing time and bias in certain societal groups.

WORKSHOP 2: LLMS FOR SOCIAL SCIENCE RESEARCH: CURRENT AND FUTURE DIRECTIONS

Maud Reveilhac (LUT University, Finland); Maud is assistant professor of digital social sciences at LUT University, Finland. She is especially interested in public opinion research during digitalization, capturing how opinions change and how our options for studying them evolve.

This workshop explores how large language models (LLMs), such as ChatGPT and other generative AI tools, are shaping the future of social science research. We will cover applications including text analysis, coding assistance, and data generation for different tasks (e.g., profiling, domain knowledge injection, ranking, and more). Trade-offs between cloud-based APIs and locally executable models will also be examined. In addition, the workshop will address strategies for ensuring validation, robustness, and ethical integrity in AI-assisted research. Whether you are a curious beginner or already experimenting with LLMs, you will gain concrete examples, hands-on exercises, and space for critical discussion. No preparation is required, but you are welcome to install R on your computer and explore basic Python notebooks in advance. That said, we will walk through everything together during the workshop.

KEYNOTE SPEECHES 1: SURVEY DATA VS. BIG DATA IN AGEING RESEARCH

Jolanta Perek-Bialas (Jagiellonian University, Poland); Jolanta is professor of sociology at Jagiellonian University, Poland, and Jagiellonian University's Centre for Evaluation and Analysis of Public Policies. She studies the effects of population ageing, using extant and self-collected survey data.

Studying age and ageing in survey data

Surveys have long been a cornerstone of social science research, particularly before the advent of big data. However, in their traditional form, surveys now face a range of methodological and practical challenges. This presentation explores the evolving role of surveys, asking a central question: What is the future of surveys, and are they still relevant? Focusing on research related to age and ageing, the presentation provides an overview of how surveys are currently used, highlighting both their strengths and limitations. Key issues such as non-response bias and the limited ability of surveys to capture behavioral data and life events will be discussed.

Drawing on examples from sociological studies conducted in Europe and Poland, the presentation illustrates how surveys—despite their constraints—remain a uniquely adaptable tool for addressing specific research questions. The policy relevance of survey findings will also be examined.

Finally, the presentation considers how combining survey data with administrative records opens new analytical possibilities for sociologists. It concludes by outlining future directions for the use of survey data in both general sociological research and studies on ageing.

Aart-Jan Riekhoff (Finnish Center for Pensions, Finland); Aart-Jan is senior researcher at the Finnish Center for Pensions and docent at the University of Tampere, Finland. He uses register data in this research, which is a form of Big Data that is available in the Nordics. **Studying age and ageing with big data**

Register data brings huge opportunities in studying age and ageing. It enables reliable research on complex phenomena, often with full population and longitudinal data. Yet, there are also challenges. Register data can be messy and usually lacks information on people's attitudes, experiences and motivation. Using examples from recent sociological research on retirement in Finland, this presentation will discuss some of these opportunities and challenges. First, using linked survey-register data, it compares a simple measure of

retirement in survey data to retirement in register data. It shows the potential for inconsistencies between the two measures, the possible reasons behind these discrepancies and the consequences for results and conclusions. Second, it moves beyond simple measures and emphasizes the growing complexity of retirement in times of deinstitutionalization and destandardization of the life course. Detailed registered data, together with advanced methods for analyzing longitudinal data, offers new opportunities for capturing the complexity of retirement. However, such analysis requires a solid theoretical basis and transparency in the choices made by the researcher. In conclusion, the presentation sets out some of the future directions and challenges for the use of register data in sociological research in general, and on age and ageing in particular.

SESSION 1: AI IN SURVEYS

Generative AI as a Tool for Quantitative Methods Training: From Dataset Simulation to Computational Analysis

Laura Arosio (University of Milano Bicocca, Italy)

Generative AI offers promising opportunities for innovating the teaching of quantitative research methods in the social sciences. In university courses, one persistent challenge is providing students with meaningful and flexible datasets to support the learning of statistical techniques and analytical reasoning. This contribution presents a didactic approach in which generative AI (e.g., ChatGPT) is used to simulate datasets tailored to specific research questions or social topics. These datasets can be adapted in complexity, size and structure to fit students' learning goals. Building on this foundation, the paper illustrates how AIgenerated textual data (e.g., diary-style entries or open-ended responses) can be analyzed using quantitative techniques. Through exercises in word frequency analysis, topic modeling and sentiment quantification, students can explore computational approaches. A case example is provided where students perform thematic content analysis on AI-generated documents using frequency tables and co-occurrence metrics. The approach enhances students' ability to manage and interpret unstructured data, while fostering methodological awareness and critical thinking about the use of AI in empirical research. This case contributes to current debates on the role of AI in advancing both data generation and analysis in the educational context, aligning with recent trends in computational social science and AI-assisted methodological training.

Keywords: generative AI, synthetic data, quantitative methods teaching, ChatGPT, text mining, AI in education, computational analysis.

Harnessing AI for Coding Open-Ended Survey Responses: A Comparative Analysis of Manual, Semi-Automatic, Machine Learning, and Generative AI Approaches

Cristina Calvo-López (University of Valladolid, Spain), Emilio Portela (University of Salamanca, Spain), Luis E. Andrade Silva (University of Salamanca, Spain) The digitalization of social research presents both opportunities and challenges in analyzing open-ended survey responses. This study explores self-identity through responses to "Who am I?" in a cross-national dataset, comparing four coding approaches: manual coding, semi-automatic classification with dictionaries, machine learning-based classification, and Generative Artificial Intelligence (GenAI)-assisted coding. We evaluate these methods based on intercoder agreement and comparison with expert-coded sample data. Findings indicate that semi-automatic coding achieves the highest accuracy and stability, while manual coding, though robust, remains resource-intensive. Fully automatic classification via machine learning struggles with short, self-referential text fragments. GenAI-assisted coding, rather than replacing human coders, enhances dictionary-based approaches by recognizing synonyms, understanding informal or conversational language, and dynamically adapting dictionaries based on emerging data trends. This streamlines analysis while maintaining interpretability and reliability. Our results highlight the potential of hybrid approaches that integrate AI with human expertise for large-scale textual data analysis in the social sciences. As AI-driven methods evolve, critically assessing their strengths and limitations remains crucial for advancing computational social research.

Data quality in an AI-generated social survey

Kathrin Komp-Leukkunen (LUT University, Finland), Maria Teresa Ballestar de las Heras (University Rey Juan Carlos, Spain)

Recent developments in generative Artificial Intelligence (AI) have opened new opportunities for quantitative research. This technology can create text and pictures of a quality comparable to that generated by humans. In market research, it is used to artificially generate survey data - with acceptable results. But does such AI-generated data also suffice for social science surveys? After all, market research is usually content with descriptive statistics at the macrolevel, whereas social sciences research typically dives deeper into social inequalities and complex social mechanisms. Therefore, survey data in the social sciences needs to adhere to higher requirements in terms of data quality. This presentation explores whether AI-generated social science surveys are of sufficient data quality. To do this, it analyses a dataset that was AI-generated using an excerpt of wave 11 of the European Social Survey codebook. For this excerpt, descriptive statistics and a dataset were generated with ChatGPT. Since this wave has been only recently released, it is not yet available online - which means that ChatGPT has not yet been trained with it. The AI-generated data is compared to the actual data of the European Social Survey. Findings show that the descriptive statistics are reasonable approximations for most variables. However, the survey data itself is a poor approximation in that it does not describe internally consistent individuals. As a result, the AI-generated data proves unsuitable for social science analyses. While generative AI is starting to make its way into quantitative analysis, it cannot yet replace traditional survey data.

Cultural Blind Spots in Generative AI: A Cross-National Evaluation of LLMs in Survey Research

Macarena Estevez (Universidad Rey Juan Carlos, Spain), María Teresa Ballestar (Universidad Rey Juan Carlos, Spain & LUT University, Finland), Kathrin Komp-Leukkunen (LUT University, Finland), Jorge Sainz (Universidad Rey Juan Carlos, Spain & IPR & University of Bath, UK)

Generative AI (GAI) is having a disruptive impact on the marketing industry. Among its most prominent capabilities, content generation is becoming a powerful tool for organizations of all sizes to gather insights about customer behaviour, marketing trends, and brand positioning. GAI is also attracting growing interest in social science research for its ability to generate survey content, enabling faster and more cost-effective insight generation. This research examines the use of Large Language Models (LLMs) in academic survey research, evaluating the extent to which they replicate the results of large-scale cross-national surveys. Using data from Round 11 of the European Social Survey, we focus on a module that explores attitudes towards feminine and masculine identities, sexism, gender discrimination, and gender inequality. We replicated part of this module using five prominent LLMs: ChatGPT (OpenAI), Gemini (Google), Claude (Anthropic), and LLaMa (Meta), Deepseek (Deepseek), for two countries with contrasting cultural backgrounds: Spain and Finland. The LLMs' responses were compared using statistical methods based on distributional distance measures and hypothesis testing. The aim is to assess whether these LLMs can accurately recreate the distribution of actual survey responses, capturing crosscountry and gender-based variations in questions that reflect personal experiences and

perceptions from a gender perspective. Our results show that LLMs can be a useful starting point for academic surveys, but their responses vary significantly by type of question and country. They also display consistent biases, suggesting some European cultures are underrepresented.

Keywords: Generative AI, Survey Research, LLMs

Does AI Take Sides? Investigating Political Leanings in LLM-Generated Samples

Zsófia Rakovics (ELTE Eötvös Loránd University, Hungary), Renáta Németh (ELTE Eötvös Loránd University, Hungary)

Large Language Models (LLMs) represent online linguistic imprints of societies that are -by their nature - different from offline societies. Therefore, a critical approach is essential to ensure that potential biases imprinted in LLMs are not overlooked in scientific and business applications. These biases can influence decision-making processes, leading to unintended consequences if not properly addressed. As a result, continuous evaluation and refinement of LLMs are necessary to promote fairness, accuracy, and ethical AI deployment. This research examines political polarisation in LLMs by comparing human- and silicon samples using machine learning methods. We generated silicon samples by prompting open-source LLMs (such as Llama model variants) to answer survey questions related to political attitudes and opinions based on the attributes of respondents of the 10th wave of the European Social Survey (ESS), then we measured political polarisation with two instruments, the Political Polarisation Index, and the "political compass", in both the human- and corresponding silicon samples. The findings indicate that LLMs are capable of generating responses that appear realistic. However, these responses tend to be more stereotypical than those derived from real-world data and exhibit an exaggerated degree of polarisation. As shown by the observed divergence between results obtained from the European Social Survey (an internationally representative dataset) and those synthetically generated by LLMs, the polarization is particularly evident in the LLM-generated samples. Consequently, a cautious and critical approach is warranted when interpreting and using the results produced by LLMs. Keywords: Large Language Models; Natural Language Processing; Political Polarisation; Stereotypes

SESSION 2: SURVEY EXPERIMENTS

Vignette, Role-playing & Visual Experiments: Studies on Identification with Robots

Nina Savela (LUT University, Finland), Reetta Oksa (LUT University, Finland & Tampere University, Finland), Eero Rantala (LUT University, Finland)

Adding experimental designs to surveys can aid in combatting some of the biases and weaknesses of traditional surveys while maintaining the strengths of carefully designed survey data collection, such as efficiency and scalability. Different types of experimental designs are particularly appropriate for providing insights into causal mechanisms and relationships between certain factors. This presentation will give an overview of three experiment types — namely vignette, role-playing, and visual experiments — utilized in survey research within social psychology and related fields to understand and predict behavioral, affective, and cognitive phenomena. Case study examples will be given for each method on the topic of team in-group identification, urban belonging, and affective responses regarding robots. These case studies utilize both validated survey instruments and sentiment analysis as outcome variables.

Keywords: robots, social identity, urban belonging, affects, work team, experiment types

Design of Vignette Experiments: A Case of Psychosocial Factors in Virtual Teams

Reetta Oksa (LUT University, Finland & Tampere University, Finland), Eero Rantala (LUT University, Finland), Nina Savela (LUT University, Finland)

Prior literature informs us that social factors such as team work engagement, psychological safety, and social support are linked to both productivity and well-being of workers, teams, and organizations. Despite the increased digitalization of workplaces, we know relatively little about whether and how digital interaction affects these social factors — for instance, the building and maintenance of psychological safety within the team. This presentation provides an example of a recent vignette survey experiment done in a project funded by the Finnish Cultural Foundation. The presentation will give an overview of the different steps of conducting this type of study by going though theoretical background behind hypothesis formation and pre-registration, as well as survey design and data collection process. Keywords: work team, psychological safety, work engagement, digital interaction, designing experiments

Analysis and Methodological Issues in Experiments: A Case Study on Virtual Teams

Eero Rantala (LUT University, Finland), Reetta Oksa (LUT University, Finland & Tampere University, Finland), Nina Savela (LUT University, Finland)

This inter-connected presentation with the previous one will focus on the statistical analysis and data collection methods in the research process of experimental designs. By utilizing a case study on team dynamics in digital interaction, this presentation will go through the methodological promises and pitfalls in the quantitative analyses and data collection phases of experimental designs. The issues presented include the basics of causal inference from the perspective of potential outcomes approach. Methodological recommendations will be given for future studies in social and behavioral sciences.

Keywords: work team, psychological safety, work engagement, digital interaction, analysis of experiments

SESSION 3: SOCIAL AND ECONOMIC CHANGE

The Impact of Export Activity on The Gender Wage Gap in Spain

Lidia de Castro Romero (Universidad Rey Juan Carlos, Spain), Víctor Martín Barroso (Universidad Rey Juan Carlos, Spain), Rosa Santero Sánchez (Universidad Rey Juan Carlos, Spain)

Gender equality is a central issue in political, institutional, and social discussions, recognized as an international goal across all sectors (UN Sustainable Development Goal 5). In this sense, economic and labor aspects are especially important, as they drive sustainable growth, innovation, and social cohesion, and analyzing exporting companies is key to understanding how globalization and international market participation can promote gender equality, particularly in wages. This research aims to analyze the gender wage gap in Spanish exporting companies compared to non-exporters, considering its effect across the entire wage distribution. The analysis will help uncover the mechanisms behind wage inequality in the context of increasing globalization. The study uses microdata from the Salary Structure Survey (2002-2022), offering detailed information on pay, employee characteristics, job roles, and company features. The gender wage gap is analyzed using an augmented version of the traditional Mincer wage equation (Mincer, 1974). The dataset's matched employer-employee data allows for fixed effects of local units or establishments in the econometric specifications, improving the estimates. Additionally, to assess the impact of export activity on wages and gender wage gaps, the study applies the UQR methodology (Firpo et al., 2009).

The findings will contribute to understanding how international market participation affects gender wage gaps and provide valuable insights for public policy and business strategies aimed at promoting gender equality and wage equity in international trade sectors.

The socioeconomic foundations of authoritarianism: economic inequality as a source of deference to authority

Cristian Márquez Romo (Goethe University, Germany)

Authoritarian leaders and parties have emerged across the world during the last decades. Although scholars have devoted a great deal of attention to the consequences of authoritarianism for liberal societies, we still know surprisingly little about its causes. Drawing on pooled cross-sections of surveys collected over the last three decades, this article examines whether economic inequality breeds authoritarianism. Using random effects within and between and country fixed-effects and slopes models, main results suggest that authoritarianism is deeply embedded within societies' historical levels of economic inequality. Across countries, persistent inequality points toward a structural driver of deference to authority. Over time, rising inequality within countries explains changes in levels of authoritarianism between the least and the most-well off, showing a divergence effect across income-based lines. Deeper analyses reveal, however, that the conditional effect of inequality over-time is largely driven by the worse-off. Providing mixed support for relative power and existential insecurity theories, findings suggest that the adverse effects of inequality on authoritarianism are largely explained by changes in power relations between more and less resourceful groups in society. These results, stable across various modeling and sample choices, contribute to a growing scholarship trying to ascertain the social sources of authoritarianism and the consequences of persistent levels of economic inequality. Keywords: Economic inequality, authoritarianism, obedience, public opinion, IVS

Parenthood in Transition? The Influence of Economic and Ecological Uncertainties on Childbearing Desires

Claudia Herbst (University of Salzburg, Austria)

Given the long-term decline in birth rates across most European countries, the significance of research on evolving family structures becomes increasingly evident. At the same time, traditional theoretical approaches appear to be reaching their explanatory limits (Comolli & Vignoli, 2021). In this context, examining the role of future-related concerns in reproductive decision-making seems promising. Using sequential multinomial logistic regression models and data from the second wave of the Norwegian Generations and Gender Survey (GGS), this study investigates the impact of ecological and economic concerns on three aspects of childbearing intentions: short-term intention to have children, general childbearing desire, and personal ideal number of children. Key predictors, such as sociodemographic characteristics and attitudes toward parenthood, were also accounted for. Additional moderation analyses were conducted to explore the extent to which the influence of concerns varies across different social groups. The findings indicate that the effect of worries is partly contingent on individuals' socio-structural positioning. Moreover, concerns moderate the relationship between attitudes, values, and the desire to have children. The results also suggest that environmental concerns increase uncertainty about respondents' childbearing desires. When controlling for additional variables, the impact of environmental concerns on the general desire to have children remains significant, whereas in the case of short-term fertility intentions, only a trend effect persists. Overall, the analyses highlight that concerns can influence childbearing desires in multiple ways. Based on these findings, further research on fertility and reproductive intentions in times of global crises should be encouraged.

Testing their wings? Gig work as a step towards entrepreneurial entry in Finland

Aart-Jan Riekhoff (Finnish Centre for Pensions, Finland), Susanna Sten-Gahmberg (Finnish Centre for Pensions, Finland)

Gig work has become increasingly widespread around the world. Some advocates of gig work see it as a potential "incubator of entrepreneurialism": by lowering transaction costs and removing barriers to entry, gig work allows aspiring entrepreneurs to test their wings. Others see gig work mainly as a precarity trap with workers being so busy making a living through their gigs that they do not have time to set up their own business. In this study, we study how likely gig workers are to become entrepreneurs, using a unique combination of full population registers from Finland. We identify gig workers in tax and income registers through payments they received from invoicing service companies between 2017 and 2022. Applying propensity score matching, we estimate the effects of becoming a gig worker on subsequently becoming self-employed (broadly defined), a sole proprietor, or an incorporated business owner during a period from one to three years later. We account for the heterogeneity among gig workers by separately analyzing those who were high-level employees, low-level employees, manual workers, unemployed, students or outside the labor force before taking up gig work. The results of the study are an important contribution to debates on whether, how and for whom gig work can stimulate entrepreneurial activity. If gig work is a way to test one's wings as an entrepreneur, it not only provides an individual with a step towards greater economic prosperity and independence, but it also could contribute to economic innovation and growth for society as a whole.

Global Scientific Production on Young People Not in Education, Employment or Training (NEET): A Bibliometric Analysis

Beyza Güdek (Karadeniz Technical University, Turkey)

NEET (Not in Education, Employment, or Training) refers to young people who are not in education, not employed, and not participating in the vocational training process. This situation is one of the social, economic, and structural problems of many countries. In a period when youth unemployment, inequality in access to education, and the risk of social exclusion are increasing, research on NEET youth has gained importance. The subject of NEET is addressed with interdisciplinary approaches in various disciplines, and its individual, family, and social effects are examined in a multidimensional manner. The increase in the number of publications in this field in recent years shows that the subject of NEET is addressed globally. This study aims to analyze scientific publications published in the field of NEET in an academic database using bibliometric methods. Within the scope of this analysis, bibliographic information of the publications such as year, country, and keywords will be evaluated. The main purpose of this study is to systematically map the literature in the field of NEET and to provide resources to researchers. In this way, it is aimed to create a strategic basis for new research opportunities that will contribute to the field and the potential for international collaboration. In addition, making thematic gaps, research intensities and interdisciplinary transitions visible in the literature through bibliometric analysis will contribute to policy development processes. In this context, the study aims to serve both academic productivity and the creation of knowledge-based policies with high social impact.

TUESDAY, JUNE 03, 2025

SESSION 4: EUROPEAN SOCIAL SURVEY Does anyone deserve to be on the losing side? Deservingness perceptions and compensating for regressive effects of environmental policies

Sami Mustikkamaa (University of Turku, Finland), Aya Kachi (University of Basel, Switzerland)

People commonly perceive environmental taxes to be unfair and particularly costly towards people with low incomes. Yet prior studies have found that compensating for vulnerable groups is not always popular either. In this paper, we hypothesize that this could happen due to perceptions of deservingness. Support for compensatory actions might be reduced if policies benefit specific groups that elicit negative perceptions of *deservingness*, such as the unemployed – who are often seen as undeserving of help. Using novel survey experiments from European Social Survey CRONOS-2, an online panel covering 12 European countries, we assess how support for compensation policies changes whether they compensate deserving or undeserving groups. Additionally, we explore heterogeneous treatment effects across countries and individuals. Our results show that attitudes towards compensatory actions bear resemblance to traditional welfare policymaking, where perceptions of deservingness clearly matter, and suggest avenues for effective climate policy communication.

Trust and CAM - The Impact of Social and Political Trust on CAM use

Santeri Ahtikari (University of Turku, Finland), Heikki Ervasti (University of Turku, Finland) Trust is a significant social phenomenon and much is known about its effects. Trust influences perceived well-being and health and seeking healthcare. Although trust has been extensively studied, there is no research on its impact on the use of CAM (Complementary and Alternative Medicine). This study examines how social and political trust influence the use of CAM in 17 European countries and how that may have changed between 2014 and 2023. In this study, social trust refers to trust in other people, while political trust refers to trust in impartial authorities and political decision-makers. CAM is divided into practitionerbased and self-administered treatments. This study also includes standardized background variables that describe socioeconomic and sociodemographic factors. Multilevel logit models show that social trust is associated with the use of both practitioner-based and selfadministered treatments. Social trust increases the use of both types of CAM treatments. Effects of political trust vary by country, but we find evidence of a negative effect of political trust in CAM use in countries with a lower general level of political trust, whereas this effect is not found in high-trusting countries.

Does populism represent a significant threat to European environmental agenda?

Dimitri Gugushvili (KU Leuven, Belgium)

It is argued that in addition to other political risks, the rise of populism in Europe poses a significant threat to environmental agenda as right-wing populist parties are usually hostile to policies aimed at addressing the climate change and naturally, they are likely to spur antienvironmental sentiments among their electorates. In the present paper we investigate whether different dimensions of right-wing populism correlate with greater opposition to six different environmental policies in 9 European countries. Our results indicate that voting for RWP parties and the thin dimension of populism – a combination of people-centrism, antielitism and Manichean outlook – are correlated with lower support only for selected environmental policies in some countries. In contrast, the thick dimension of European RWP – nativism – is consistently and strongly associated with opposition to all policies in the majority of countries. Policy framing also matters, as RWPs react positively to some policy attributes, and negatively to others.

Demonstrating the methodological decisions required to perform mediation analysis using evidence from the European Social Survey for four European countries *Anastasia Charalampi (Panteion University of Social and Political Sciences, Greece), Aggeliki Yfanti (Academy of Athens, Greece)*

In recent literature, mediation analysis has been used quite extensively without however exploring first all the necessary requirements for its application. In this study, the necessary methodological considerations required for the application of mediation analyses are presented empirically using evidence from the 2012 European Social Survey (ESS) for Denmark, France, Poland and Portugal that provides functioning as a dimension of wellbeing as well as measurements of satisfaction with life, happiness and personal security considered core elements of wellbeing. Furthermore, there is evidence of large effects linking interpersonal difference of subjective wellbeing to social and political trust. The methodology is demonstrated by exploring the effects of linking a social trust index and a political trust to national institutions scale and functioning as a determinant of wellbeing through a path analysis model using a subjective wellbeing (SWB) index and feelings of safety as mediating variables. Four separate mediation analyses were performed to test the indirect effect of social and political trust on functioning by SWB and feelings of safety. The full mediation model provided acceptable model fit for France, Poland and Portugal and adequate model fit for Denmark. In all countries, functioning was positively predicted by SWB and feelings of safety, and SWB and feelings of safety were positively affected by social and political trust. Significant indirect effects of social and political trust by SWB and feelings of safety were detected. Further research is necessary in every country of this Round in order to explore the cross-national comparability of the findings demonstrated.

Keywords: Mediation analysis, Wellbeing, Safety, Trust, European Social Survey

Using or Not Weights in Structural Equation Modeling - An Example of the Political Satisfaction-Political Trust Model

Magdalena Poteralska (Warsaw School of Economics, Poland), Jolanta Perek-Białas (Jagiellonian University, Poland & Warsaw School of Economics, Poland)

The analysis applying complex design and weighting techniques in Structural Equation Modeling, which encompasses both theoretical considerations, practical limitations and possibilities within available statistical software, still appears to be limited - despite the topic seeming not to be new. Using the European Social Survey (ESS) and Multigroup Confirmatory Factor Analysis (MGCFA) on political satisfaction and political trust, the estimation consequences of four complex sample analysis scenarios will be demonstrated. These usually include a naïve approach and those adjusted with sampling weights and design variables. Empirically, analysis often assumed a simple random sample in MGCFA which can result in divergent coefficients, biased estimates of latent covariances and mean differences, and underestimated standard errors. These in turn affect confidence intervals, goodness-of-fit indices, composite reliability, and convergent validity metrics, potentially undermining the validity of the research design and results, the reliability of inferences, and the comparability of outcomes across countries. In the paper, it will be illustrated how results could vary when using different software packages under similar estimation settings. In conclusion, there is an urgent need for researchers who work with a complex sample analysis in their work when SEM is applied, using weights and design variables, to clearly present their applied approach in analysis, depending on the software used.

SESSION 5: RESPONSE BEHAVIOUR

Do respondents react differently to avatars as compared to humans?

Fabienne Wöhner (University of Bern, Switzerland), Axel Franzen (University of Bern, Switzerland)

Today, artificial intelligence allows new forms of data collection such as presenting information with the help of avatars in online surveys. However, respondents might react differently to avatars as compared to real humans. The presentations of avatars might appear as being more artificial than the performance by real humans. Hence, avatars might be perceived as machines and information presented by avatars might be evaluated as being less reliable and less trustworthy. In this study we investigate the evaluations of presentations given either by avatars or by humans. The avatars were created from the video footage of the human actors. We present videos of both, humans and avatars, to a representative sample of the Swiss population (N = 2900) in an online survey. The presentations deal with three different topics. Respondents watch either a two-minute video on a technical topic (solar radiation management), on a topic taken from training methods in ski racing (vibration strength training), or on a topic from pedagogical therapy (marte meo technique). After watching the videos, respondents had to evaluate the presenting character (avatar versus human) with respect to intelligence, competence, credibility, and authenticity. Furthermore, presentations were also graded and evaluated regarding their convincibility. The results show that human characters received always better evaluations as compared to avatars. This applies to all three different topics and independently of whether the presenters are female or male characters. Hence, respondents react differently to avatars as compared to humans and the latter cannot easily be substituted by avatars.

Keywords: artificial intelligence, evaluation of avatars, credibility of avatars

Assessing the Impact of Self-Administered Modes on Measuring Attitudes in the European Values Study

Anastasiia Kiiski (University of Helsinki, Finland)

The European Values Study (EVS), launched in 1981, remains one of the most significant longitudinal surveys for analyzing values and cultural change across Europe. However, recent shifts in the EVS methodology, notably the introduction of self-administered modes (e.g., CAWI) in the 2017 wave, have highlighted the impact of digitalization on both the reliability and cross-national comparability of the survey data. This paper critically examines how changes in data collection methods affect the measurement of respondents' attitudes, using the Morally Debatable Behaviors Scale (MDBS) as an example. It particularly focuses on the potential for social desirability bias and variations in response patterns. The study reveals significant discrepancies in reported attitudes by analyzing data from countries which employed both traditional face-to-face methods and web-based surveys. This methodological change raises substantial questions regarding the validity of the findings, as the differences in how individuals engage with the survey — when completing it independently, for example — may result in variations that are not reflective of true attitudes but rather of the context in which the data were collected.

Static or Animated? How Ad Design Shapes Survey Recruitment

Anna Hebel (GESIS – Leibniz Institute for the Social Sciences, Germany) Social networking sites (SNS) have become increasingly popular for recruiting survey respondents, with platforms like Facebook and Instagram enabling researchers to reach diverse audiences through targeted advertisements. The design of the ads is crucial when using this method, as they must capture the user's attention within seconds. While previous studies highlight the significance of ad design in recruitment performance, sample composition, and data quality, most focus on static images. However, static images represent only one possible design format, and the potential effects of animated images remain underexplored. This study extends prior research by systematically comparing the effects of static and animated ad images on three key aspects of survey recruitment: performance, sample composition, and data quality. While animated images may enhance salience and increase recruitment performance, their influence on sample composition and data quality remains unclear. I investigate the relation between ad design and sample composition and examine whether the performance of static vs. animated images differs depending on the socio-demographic group. I analyze data from a 41-day recruitment campaign conducted on Facebook and Instagram to explore these effects. The campaign tested four static images and their identical animated counterparts, allowing us to assess variations in recruitment efficiency and data quality. The findings provide valuable insights for researchers and practitioners aiming to optimize survey recruitment strategies on SNS. Ultimately, this study addresses the research question: "What role do design formats play in shaping ad performance, sample composition, and data quality?"

Did you say "self-administered"? Reflections on supporting strategies towards greater respondents' participation in online surveys

Léonie Hénaut (CNRS and Sciences Po, France), Laure Crepin (CNRS and Sciences Po, France), Marie-Aline Bloch (School of Public Health EHESP, France)

Although much research has already been carried out using online survey software, we know little about its use in the social sciences. This paper reflects on our own recent experience surveying people who held at some point in their career the same position as social and healthcare services administrator in France (N=371 respondents, that is 64 % of the targetpopulation). After presenting the characteristics of our survey, we describe three groups of strategies that we deployed to support respondents' participation: (1) building up interest and commitment into the survey among target-population while collecting electronic contacts through digital traces, LinkedIn and former colleagues; (2) securing participation by being both reactive and proactive in the management of interactions with respondents during the online survey period; (3) collecting responses of hard-to reach people by carving out personalized follow-up messages till the closure of the survey. Overall, the considerable work carried out by the research team did not only increase the participation rate but also rebalance the composition of the responses in favor of people who might have felt less concerned by the survey or less enthusiastic to participate in the study. We therefore did alleviate the two major problems related to self-administered questionnaire online compared to face-to-face surveys: the fact that non-response rate tends to be higher, and that only people interested in the survey answer it (self-selection bias). We argue that when such remote, asynchronous and interactive support work is implemented, online survey constitutes a new method of administering questionnaires. Last, the paper reflects on the practical, methodological and ethical limitations of our strategies.

Evaluating methods to prevent and detect inattentive responding in web surveys

Lukas Olbrich (Institute for Employment Research, Germany)

Inattentive respondents pose a substantial threat to data quality in web surveys. In this study, we evaluate methods for preventing and detecting inattentive responding and investigate its impacts on substantive research. We use data from two large-scale non-probability surveys fielded in the US. Our analysis consists of four parts: First, we experimentally test the effect of asking respondents to commit to providing high-quality responses at the beginning of the survey on various data quality measures (attention checks, item nonresponse, break-offs, straightlining, speeding). Second, we conducted an additional experiment to compare the

proportion of flagged respondents for two versions of an attention check item (instructing them to select a specific response vs. leaving the item blank). Third, we propose a timestampbased cluster analysis approach that identifies clusters of respondents who exhibit different speeding behaviors and in particular likely inattentive respondents. Fourth, we investigate the impact of inattentive respondents on univariate, regression, and experimental analyses. First, our findings show that the commitment pledge had no effect on the data quality measures. As indicated by the timestamp data, many respondents likely did not even read the commitment pledge text. Second, instructing respondents to leave the item blank instead of providing a specific response significantly increased the rate of flagged respondents. Third, the timestamp-based clustering approach efficiently identified clusters of likely inattentive respondents and outperformed a related method, while providing additional insights on speeding behavior throughout the questionnaire. Fourth, we show that inattentive respondents can have substantial impacts on substantive analyses.

SESSION 6: RESEARCH WITH PRIMARY SURVEY DATA

East German Identity: Development of a Measurement Instrument and Empirical Analysis of Collective Deprivation Experiences after Reunification in Germany

Emma Roßbach (Chemnitz University of Technology, Germany), Jochen Mayerl (Chemnitz University of Technology, Germany)

More than three decades after German reunification, East German identity remains a significant phenomenon. Contrary to the prevailing expectation that the differences between East and West Germany would diminish over time, recent research suggests that East German identity is still a feature of younger generations born after 1990 (Mau et al., 2024). This persistence indicates that full societal convergence has not been achieved. Instead, East German identity is shaped by collective experiences of inequality and deprivation but varies across subgroups, such as generations or political self-categorization. To explore this ongoing relevance, we developed and validated a new instrument to measure East German identity as a multidimensional construct. This scale accounts for both universal elements of East German identity and subgroup-specific variations. We use multi-group confirmatory factor analysis to cross-validate the instrument. First, an online survey of 1,638 participants from a Saxonywide access panel provided the foundation for the scale's development. Second, a mixed mode random sample from the Chemnitz region (push-to-web and postal survey, n=600) was used for validation. The sample for the survey (4,779 people) was randomly selected from the residents' registration office of the city of Chemnitz and 20 neighbouring municipalities in Saxony, Germany. Our findings reveal that some dimensions of East German identity and experiences of deprivation are widely shared, while others vary by subgroup. This study contributes methodologically by providing a validated tool to measure multidimensional East German identities. It also offers insights into the persistence of societal disparities and their potential link to political attitudes, including right-wing populism in Germany. Keywords: deprivation, cross-validation, multi-group analysis

Environmental Citizenship among Higher Education Students: The Italian Case

Arianna Calderamo (Sapienza University of Rome, Italy), Simona Cavallo (Sapienza University of Rome, Italy), Alfonsina Mastrolia (Sapienza University of Rome, Italy) In contemporary society, environmental education has become central in global educational programs. Within this framework, the present study, part of the European COST project "Phoenix – Protection, Resilience and Rehabilitation of Damaged Environments", involved higher education students across Europe and the Middle East. The research focuses on the Italian case and aims to quantitatively investigate the role of education in promoting sustainable behaviour and eco-citizenship. It is based on the idea that exploring the relationship between eco-citizenship (Dobson, 2003) and technology is essential to understanding how innovation can reduce the environmental impact (Barry, 2006). The objective is to support environmental citizenship awareness by enabling students to define and critically analyse environmental challenges, participate actively.

Based on a survey methodology, the study applies a quantitative approach to data analysis. The open web survey (Couper, 2011) involved 205 students from Sapienza University of Rome and the University of Florence, who were reached through a list of "educational mobilization representatives" within the universities. The results show high levels of motivation and competence in eco-citizenship, indicating strong environmental awareness. These findings are valuable for policymakers, educators, and environmental organizations in developing strategies to promote eco-citizenship among students.

Keywords: Eco-citizenship Education, Sustainability, Environmental commitment, Quantitative research

Attitudes Towards Virtual Healthcare Assistants in the D-A-CH Region – Investigating Social Determinants Using Higher Order Factor Structural Equation Modelling

Florian Nemetz (Vienna University of Business and Economics WU, Austria), Wolfgang Aschauer (University of Salzburg, Austria), Christopher Etter (University of Salzburg, Austria), Patrick Kutschar (Paracelsus Medical University PMU, Austria/Germany) Due to demographic shifts, a substantial rise in healthcare demand among the elderly population is anticipated (cf. Dall et al., 2013; Harper, 2014). One promising approach to address these emerging challenges is the adoption of modern technologies, including telecare solutions and virtual healthcare assistants (VHAs) (Turner & McGee-Lennon, 2013; Schulz et al., 2015; Miller & Polson, 2019). However, as the WHO emphasizes, healthcare systems are expected to enhance population health, simultaneously minimizing health disparities (Murray & Frenk, 2000). In the realm of eHealth, this task is complicated by "digital divides" (Lythreatis et al., 2022), which lead to unequal access to technology, differences in digital skills, and consequently unequal usage of digital healthcare tools (Cornejo Müller et al., 2021). This study examines public attitudes toward the VHA "Addison", a tablet-based support tool designed for older adults living independently. We conducted a comprehensive online survey across the D-A-CH region in spring 2023, using a quota sample. Each country had over 1,500 participants. The study incorporates background variables to capture variations in technological readiness across social groups and countries. Additionally, we account for subjective factors that may influence attitudes towards VHAs (e.g., invidual wellbeing). Employing robust measurement scales, we apply structural equation modelling with second-order factors to illustrate the complex mechanisms through which social inequalities affect attitudes toward VHAs. The findings highlight the role of social inequality in shaping technological readiness and reveal both the potential and limitations of higher order structural equation modelling in uncovering intricate relationships between sociodemographic factors and attitudes.

Keywords: Healthcare, Digital Divide, Higher Order Factor Model, Virtual Healthcare Assistant

Investigating the "Run Rome The Marathon" through a multi-stakeholder web survey. The role of digitization in the "mixed-methods" research design of Sapienza University of Rome

Maria Paola Faggiano (Sapienza University of Rome, Italy), Ernesto Dario Calò (Sapienza University of Rome, Italy)

The Rome Marathon, now in its 30th edition, has undergone a very significant evolutionary process, sociologically configuring itself as a "total social fact": involving a complex system of symbolic universes and social actors, it is much more than a sports competition. The organizers interface with various institutional subjects to establish the details of the event, the policies related to security, the adequate information and media coverage, the management of traffic and other general lines of conduct valid for the entire duration of the event. There are also numerous subjects belonging to the Third Sector appointed to extend the public and social utility function of the event. Finally, the initiative is aimed at athletes and their companions, sports tourists and ordinary citizens.

To reproduce the versatility of such a phenomenon, a complex methodological system was developed, based on a mixed-methods approach capable of enhancing qualitative and quantitative empirical analyses. The research design involved the synergistic combination of numerous techniques, among which a web survey stands out. Access to the database with the basic information on the participants in the sporting event in a historical series, in-depth interviews with privileged witnesses and ordinary citizens of the local area and content analysis of the websites of the most important marathons on the international scene have provided a very rich empirical basis. Many of the opportunities for data collection and analysis were made possible by the process of digitization, which allowed us to expand and integrate the investigative team's toolbox.

Testing the Causal Effect of Victimization on Fear of Crime: A Latent Differences-in-Differences Approach

Henrik K. Andersen (Chemnitz University of Technology, Germany), Deliah Wagner (Center for Criminological Research Saxony, Germany), Jochen Mayerl (Chemnitz University of Technology, Germany), Frank Asbrock (Chemnitz University of Technology, Germany & Center for Criminological Research Saxony, Germany)

The relationship between victimization and fear of crime is well-documented, but establishing a causal link has remained a challenge due to the complexity of psychological processes and the presence of unobserved confounders. This study addresses these challenges by employing a latent differences-in-differences (DiD) approach within the structural equation modeling (SEM) framework, offering a rigorous test of the so-called victimization hypothesis. Using longitudinal panel data from a representative sample of the German population (Wagner et al., 2024), we examine how personal experiences of street crime (burglary, robbery, and assault) influence fear of crime over time. By modeling fear of crime as a latent construct, this approach controls for both measurement error and unobserved timeinvariant confounders, enhancing the precision of the causal estimates. Our findings indicate that individuals who became victims of crime exhibit a significant increase in fear of crime, with a latent mean difference exceeding one scale point on a seven-point scale. Measurement invariance tests confirm that the construct is stable across time points, ensuring that observed changes reflect real psychological shifts rather than measurement artifacts. This study not only advances the application of SEM in causal analysis but also contributes to criminological theory by empirically validating the victimization hypothesis at the individual level. The latent DiD approach offers a powerful tool for disentangling complex social phenomena, providing a model for future research on longitudinal data with latent constructs. Keywords: Victimization, Fear of Crime, Causal Analysis, Structural Equation Modeling, Latent Differences-in-Differences, Measurement Invariance

KEYNOTE SPEECHES 2: TRADITIONAL STATISTICAL ANALYSIS VS. MACHINE LEARNING IN RESEARCH EVALUATION

Fabrizio Martire (Sapienza University of Rome, Italy); Fabrizio is professor of sociology at Sapienza University of Rome, Italy. He explores public opinion and evaluation as well as ways to study them. He is particularly interested improving quantitative data collection methods.

Studying higher education policies with traditional quantitative methods

The presentation will address: a) some implications and consequences that evaluation of research quality can have on scientific communities and on the daily activities of individual researchers; b) the methodological challenges to detect and analyze those consequences. The framework of the discussion will be the triangulation / interaction between three distinguishable processes: accountability, evaluation and learning. There is a type of evaluation, formative evaluation, which is explicitly conceived as a learning strategy for the subjects who are evaluated. However, it is now widely recognized by scholars that any evaluation always implies learning, at least implicitly, even if it does not have it as an explicit objective. This is a very crucial awareness which leads to studying learning also as an inevitable consequence, and which can also take the shape of unexpected consequences, of any evaluation. How can quantitative research detect and analyze the consequences of evaluation? Within the framework outlined above, how can traditional quantitative methods identify and analyze different ways of adapting to the pressures of evaluation, or, that is the same, different forms of learning from evaluation? In the more strictly methodological part of the presentation, the main forms of quantitative analysis to study the effects of evaluation will be illustrated, also through examples; showing their potential, limits and possibilities of integration; and also opening questions on whether and how algorithms and AI can overcome the limits of traditional techniques.

Maria Teresa Ballestar de las Heras (University Rey Juan Carlos, Spain); Maria Teresa is associate professor of applied economics at the Universidad Rey Juan Carlos, Spain, and head of analytical consultants at Google, Spain. She uses Artificial Intelligence in her work in academia and the private sector.

A novel machine learning approach for evaluation of public policies: An application in relation to the performance of university researchers

Research has become the main reference point for academic life in modern universities. Research incentives have been a controversial issue, because of the difficulty of identifying who are the main beneficiaries and what are the long-term effects. Still, new policies including financial incentives have been adopted to increase the research output at all possible levels. Little literature has been devoted to the response to those incentives. To bridge this gap, we carry out our analysis with data of a six years program developed in Madrid (Spain). Instead of using a traditional econometric approach, we design a machine learning multilevel model to discover on whom, when, and for how long those policies have an effect. The empirical model consists of an automated nested longitudinal clustering (ANLC) performed in two stages. Firstly, it performs a stratification of academics, and secondly, it performs a longitudinal segmentation for each group. The second part considers the researchers' sociodemographic, academic information and the evolution of their performance over time in the form of the annual percentage variation of their marks over the period. The new methodology, whose robustness is tested with a multilayer perceptron artificial neural network with a backpropagation learning algorithm, shows that tenure track researchers present a better response to incentives than tenured researches, and also that gender plays an important role in academia. These discoveries are relevant to administrations and universities for understanding the

productivity of academics working under long-term incentive-based programs, the drawbacks and the inequalities for maximizing the generation of knowledge.

SESSION 7: SHARE FINLAND

Combining data on Survey of Health, Ageing and Retirement in Europe with Finnish register data

Inna Lisko (University of Eastern Finland, Finland), Tiia Kekäläinen (Laurea University of Applied Sciences), Olli Kurkela (Finnish Institute of Occupational Health, Finland), Leena Forma (University of Eastern Finland, Finland & Tampere University, Finland)

ntroduction: Survey of Health, Ageing and Retirement in Europe (SHARE) is a multidisciplinary panel survey. Since 2004, the biennial data collections on individuals aged 50+ have included 28 countries, 616 000 interviews and 160 000 respondents. Finland joined SHARE in 2017 in the 7th wave. Our objective is 1) to present how SHARE data and Finnish register data can be and have been combined, and 2) to explore if respondent profiles differ based on register data consent.

Methods: Data come from the Finnish respondents (N=1,758) of the 9th wave of SHARE collected in 2021–2022. Registers from Statistics Finland, Social Insurance Institution of Finland (Kela) and Finnish Centre for Pensions can be combined to SHARE data. This has been done in a project called Ikäkyky, aiming to understand how rehabilitation and health benefits are associated with work ability and continuation of work. Consent for combining register data with survey responses was given by 79% of the respondents. Data on demographics, health, physical functioning and workability were compared based on register data consent (yes/no) with chi square test.

Results: Declining from register data consent was more likely among respondents who rated their health as weak (p=0.040) and who were not married (p=0.019) as compared to those who gave consent.

Discussion: Combining SHARE with register data provides many opportunities (e.g. complementing registry data with self-reports; exact dates for work/retirement status available) yet poses challenges (e.g. survey timing in relation to rehabilitation). Some small differences exist between respondents based on register data consent.

Is work done in retirement linked to health and well-being in Finland and Europe?

Antti-Jussi Kouvo (University of Eastern Finland, Finland & University of Turku, Finland), Tomi Oinas (University of Eastern Finland, Finland), Ismo Linnosmaa (University of Eastern Finland, Finland & Finnish Institute for Health and Welfare, Finland), Inna Lisko (University of Eastern Finland, Finland)

The functional capacity of the aging population is better today than it was a few decades ago. The ages 65–75 represent a stage of life in which health and functional capacity enable many to actively participate in society. Our research questions are: 1) What work and family related factors explain work done after retirement in Europe and Finland? 2) Is working past retirement age linked to well-being and what factors moderate this relation. The study examines the connection between work done after retirement and well-being and health using longitudinal data from the Survey of Health, Ageing and Retirement in Europe (SHARE). The biannual collection of SHARE data started in 2004 and includes 616 000 interviews of 160 000 respondents from 28 European countries. Data for Finland is available from year 2017 onwards. Working after retirement was defined as working for pay while also receiving pension income. In addition to descriptive statistics, we use multivariate methods that take into account the repeated measurements at individual level and the clustering of individuals within countries. First, we apply random effects logistic regression models to examine what family and work-related factors predict working past retirement age. Second, we employ fixed effects logistic regression to analyse how working after retirement is related to wellbeing and whether this relation differ depending on the country. The results show that the well-being effects of work done in retirement vary significantly by country and, among other things, by the individual's background factors and work history. Finally, we discuss the policy implications of the study and topics for further research.

Where to age healthy? Comparing health outcomes of older people in different healthcare systems in Europe

Ismo Linnosmaa (University of Eastern Finland, Finland & Finnish Institute for Health and Welfare, Finland), Terhi Auvinen (University of Eastern Finland, Finland), Lauri Kortelainen (University of Eastern Finland, Finland), Olli Salmensuu (University of Eastern Finland, Finland), Minna Kaarakainen (University of Eastern Finland, Finland & Savonia University of Applied Sciences, Finland)

Objectives: Although the effects of healthcare systems on morbidity and mortality are affirmed to exist among policy makers, the systematic comparison of health outcomes in different healthcare systems in empirical research is less common due to challenges in measuring healthcare systems. We apply healthcare system classification developed by Böhm et al. (2013) and risk-adjustment methodology to compare health outcomes in different healthcare systems in Europe and ask further if age-related changes in risk-adjusted health outcomes differ between healthcare systems.

Methods: We utilized SHARE (Survey of Health, Ageing and Retirement in Europe) data from wave 8, consisting of 46 574 individuals older than 50 years from 27 countries. The data set contains individual-level information about the number of chronic diseases (NOCDs), the number of limitations in activities and instrumental activities of daily living (ADLs and IADLs), self-assessed health, demographic and socio-economic variables, and lifestyle factors. In addition, we linked information about NOCDs and ADL and IADL limitations from the previous wave 7 to our data and, to measure healthcare systems, we used Böhm et al. (2013) healthcare system classification: National Health Service (NHS), National Health Insurance (NHI), Social Health Insurance (SHI), Etatist Social Health Insurance (ESHI) and Private Health System (PHS). A risk-adjustment model was developed to compare NOCDs between different healthcare systems. We first computed the difference between the observed and expected NOCDs and then regressed the risk-adjusted NOCDs on the categorical healthcare system and age variables and the interactions between the system and age. The Poisson count data model was used to predict the expected NOCDs. We added age, sex, education, obesity and the lagged NOCDs and the ADL limitations as risk-adjustment factors for the model.

Results: Our results indicate that the mean value of the risk-adjusted NOCDs was lowest (second lowest) in the NHI (NHS) countries and highest (second highest) in the ESHI countries from Eastern Europe (SHI countries). On average, the observed NOCDs was lower (higher) than expected by the risk-adjustment factors in the NHI and NHS countries (ESHI countries from Eastern Europe). In comparison to the youngest age group (50-64 years old), the oldest age groups (75-84 and 85+ years old) in ESHI countries from Eastern Europe have higher risk-adjusted NOCD than in any other healthcare system in Europe.

Discussion: We find differences in the risk-adjusted NOCDs between healthcare systems in Europe. These findings are mostly likely explained by differences in access to health care. Our findings can benefit national decision-makers in their efforts to improve their healthcare systems.

(Un)happy together - the interrelated life satisfaction in older couples

Terhi Auvinen (University of Eastern Finland, Finland), Joonas Uotinen (Finnish Institute for Health and Welfare, Finland), Maria Vaalavuo (Finnish Institute for Health and Welfare, Finland)

While previous research has shown that good social relations are part of our subjective wellbeing and that being in a partnership improves it, we explore an uncharted field of researchhow partner's life satisfaction is associated with one's own life satisfaction among older (50+) couples in Europe. We also study the moderating role of caregiving, health difference, and social relations. Our analysis sample includes 153 302 observations (48 314 individuals in 24 157 couples) from 28 European countries. We analyse longitudinal data from six waves of Survey of Health, Ageing and Retirement in Europe with fixed effects regression techniques. We tested the potential asymmetry of the within-regression estimates by utilising asymmetric first-difference model developed by Paul Allison, i.e. does negative change in partner's life satisfaction have different effect than positive change. There were no meaningful differences, so we proceeded with more efficient traditional fixed effects estimation. All analyses are conducted separately for men and for women, to be able to detect differences between gender, and because the dyadic nature of our data violates the independence assumption of regression analysis. Our dependent variable, and the selected measure for subjective well-being is life satisfaction (scale 0-10). Respectively, the main independent variable is the "life satisfaction of a partner" measured in the same wave and the same way as the respondent's life satisfaction. Our results show that the association between partners' life satisfactions was relatively strong, even when controlling for health, demographics, and socioeconomic determinants of both partners. Furthermore, the association between life satisfactions got slightly weaker when respondent had a broader social network, and if there was a health difference between partners where respondent without health issues had a partner with disabilities or chronic conditions. Giving or receiving informal care did not affect the association for men, but for women, receiving care strengthened the association. There were also notable differences between countries-a finding that should be explored more in future studies. The strong association between partners' life satisfaction could be better taken into account in social and health policies as well as research on well-being. Our results suggest that health and well-being interventions may be more effective if they address both members of older couples. Furthermore, costeffectiveness analyses that fail to consider these interdependencies may lead to suboptimal allocation of public resources.

Ageing and loss of resources – does empirical evidence support the idea of loss spirals?

Terhi Auvinen (University of Eastern Finland, Finland), Mieke Rijken (Netherlands institute for health services research Nivel, The Netherlands & University of Eastern Finland, Finland), Ismo Linnosmaa (University of Eastern Finland, Finland)

While previous research has shown that good social relations are part of our subjective wellbeing and that being in a partnership improves it, we explore an uncharted field of research how partner's life satisfaction is associated with one's own life satisfaction among older (50+) couples in Europe. We also study the moderating role of caregiving, health difference, and social relations. Our analysis sample includes 153 302 observations (48 314 individuals in 24 157 couples) from 28 European countries. We analyse longitudinal data from six waves of Survey of Health, Ageing and Retirement in Europe with fixed effects regression techniques. We tested the potential asymmetry of the within-regression estimates by utilising asymmetric first-difference model developed by Paul Allison, i.e. does negative change in partner's life satisfaction have different effect than positive change. There were no meaningful differences, so we proceeded with more efficient traditional fixed effects estimation. All analyses are conducted separately for men and for women, to be able to detect differences between gender, and because the dyadic nature of our data violates the independence assumption of regression analysis. Our dependent variable, and the selected measure for subjective well-being is life satisfaction (scale 0-10). Respectively, the main independent variable is the "life satisfaction of a partner" measured in the same wave and the same way as the respondent's life satisfaction. Our results show that the association between partners' life satisfactions was relatively strong, even when controlling for health, demographics, and socioeconomic determinants of both partners. Furthermore, the association between life satisfactions got slightly weaker when respondent had a broader social network, and if there was a health difference between partners where respondent without health issues had a partner with disabilities or chronic conditions. Giving or receiving informal care did not affect the association for men, but for women, receiving care strengthened the association. There were also notable differences between countries-a finding that should be explored more in future studies. The strong association between partners' life satisfaction could be better taken into account in social and health policies as well as research on well-being. Our results suggest that health and well-being interventions may be more effective if they address both members of older couples. Furthermore, costeffectiveness analyses that fail to consider these interdependencies may lead to suboptimal allocation of public resources.

SESSION 8: AI: EMOTIONS AND IMPLICATIONS

AI as an Emotional Companion? A Computational Analysis of AI-Mediated Emotional Support and Emerging Emotional Norms

Lilian Amabili Leupold (Technische Universität Dresden, Germany)

AI-driven tools like ChatGPT are increasingly used for emotional expression, companionship, and self-reflection. This study examines how users engage emotionally with AI and whether signs of recurring interaction patterns emerge. Rather than assuming AI can replace human relationships, this research explores emotionally routinized engagement cycles in AI-human interaction. Drawing from a dataset of 20,000+ YouTube comments on AI companions, selected for high engagement and thematic relevance, this study analyzes how users articulate, negotiate, and structure emotional engagement with AI, where emotional expressions are shaped by platform incentives. Building on Hochschild's (1983) insights on emotion norms, this study examines how AI-mediated interactions reinforce patterns of emotional reciprocity, validation-seeking, and repetitive engagement. This study addresses the following questions: RQ1. What themes emerge in AI-mediated emotional discourse? (Topic Modeling: BERTopic/LDA) RQ2. What linguistic markers indicate repetitive AI interaction patterns? (Lexical + recurrence analysis) RQ3. How does sentiment evolve over recurring user comments and engagement trends over time? (Sentiment trajectory analysis) RQ4. What user clusters emerge based on sentiment trends, engagement patterns, and interaction frequency? (HDBSCAN clustering) RQ5. How do users describe patterns of emotional engagement and reinforcement in discussions about AI companions? (Lexicon + engagement metrics). This research advances quantitative methods in digital social science by offering a computational framework for analyzing AI-mediated emotional engagement, emphasizing the need for ethical oversight and further cross-platform investigation. Keywords: AI emotional engagement, emotion norms in AI interactions, sentiment trajectories in AI discourse, engagement loops & reinforcement cycles, platform incentives & emotional regulation

Living in the World Blurring Truth: Public Concerns and Perceptions of AI-Generated Images

Shiqi Yang (University of Jyväskylä, Finland)

The rapid advancement of Generative AI (Gen-AI) in image synthesis has raised critical concerns about digital authenticity, misinformation, and public trust. This study examines public reactions to AI-generated images by analyzing large-scale online discussions from Xiaohongshu (Rednote), a major image-based social media platform in China. Using Natural Language Processing (NLP) techniques, we assess user awareness, skepticism, and cognitive strategies in distinguishing AI-generated visuals. For data processing, we integrate expert labeling with a BERT-based classification model to enhance accuracy. To extract underlying thematic patterns, we apply BERTopic, a deep learning-driven topic modeling technique that surpasses conventional LDA. The discussion of detection strategies is grounded in Dual Process Theory, identifying two primary cognitive approaches: heuristic (System 1), which relies on intuition, and analytical (System 2), which involves critical reasoning and logical evaluation. Additionally, sentiment analysis reveals strong emotional responses, including fear and shock, toward AI-generated images. Our findings provide empirical insights into real-world human reactions and highlight significant disparities in detection strategies across different user groups. By bridging computational modeling with psychological frameworks, this study contributes to the broader discourse on public adaptability to AI-generated media and the challenges of misinformation detection.

Keywords: Generative AI, image authenticity, NLP, Gen-AI detection, social media discourse analysis

Analyzing AI-Powered Learning: Exploring the role of a chatbot in supporting Self Regulated Learning (SRL)

Nisha Yadav (LUT University, Finland)

Artificial intelligence (AI) tools like chatbots are being used to support personalized and adaptive learning. In this study, I examined interactions and perceptions of students with varying SRL (Self Regulated Learning) skills with a chatbot. Metacognitive Awareness Inventory (MAI) questionnaire, log data and retrospective interviews were used as sources of data for the study. The results showed that students with lower SRL skills engaged more actively with the chatbot. However, there was no significant link between a student's SRL level and the frequency or order of their actions. Both groups benefited from self-assessment and feedback in supporting their SRL processes. The variation in engagement levels between the two groups appeared to be influenced by contextual factors. These factors were chatbot's limitations like restricted AI capabilities, limited content formats, and its primary use for revision. This study provided insights for designing AI-based educational tools that better support self-regulated learning. Improving the chatbot's design by addressing the contextual factors could enhance its effectiveness. While the chatbot facilitated some SRL processes, further improvements could strengthen the connection between SRL and the chatbot's features. Future research should focus on evaluating the chatbot's impact on SRL by analyzing strategic interactions in more depth.

From Emotion to Data: The Quantitative Analysis of Digital Educational Relationships through Generative Artificial Intelligence

Simona Cavallo (Sapienza University of Rome, Italy), Laura Tolentino (Sapienza University of Rome, Italy)

The post-pandemic proliferation of educational and technological tools calls for deeper theoretical reflection and empirical research to better understand the educational relationship within digital environments. Drawing on data from the university research project "*La Valutazione dell'Impatto Sociale della DaD dopo il Covid 19*", conducted by Sapienza University of Rome, this study focuses on emotional dynamics within digital learning spaces. From a technical and methodological standpoint, secondary qualitative data were analyzed

using innovative text analysis techniques based on generative Artificial Intelligence. AI-based tools can be applied to narrative qualitative data to identify recurring emotional patterns or expressive differences across groups, serving as instruments for quantifying textual content and enhancing the depth of qualitative analysis (Christou, 2024; Thelwall et al., 2010). This research employs Sentiment Analysis and Emotion Detection techniques (Mohammad, 2020) to examine transcripts of interviews and focus groups with students and faculty members, aiming to explore the emotions expressed within digital educational relationships (Montanari & Costantini, 2020). By adopting a critical and innovative perspective, the study contributes to a broader understanding of the effects of digitalization on contemporary society and reflects on both the potential and methodological limitations of emerging technologies and the use of AI in the social sciences (Giuffrida & Mazzeo Rinaldi, 2020). Keywords: Generative Artificial Intelligence, Digital Educational Relationship, Sentiment

Analysis and Emotion Detection, Computational Analysis of Qualitative Data

Methodological Approach to Analyzing Disinformation Spread: Web Scraping, Network Analysis, and AI

Pablo Pastora Estebanez (Universidad de Málaga, Spain)

Disinformation on social media has become a major challenge, particularly during crises and natural disasters, where false claims can spread rapidly and influence public perception. This study proposes a methodology using new techniques that are being implemented in the analysis of the digital public sphere for analyzing the spread of disinformation on social media, combining web scraping, network analysis, and artificial intelligence. As an example, it examines the false claim about the deaths in the flooding of the Bonaire shopping mall parking lot in Valencia, Spain, during the Depresión Aislada en Niveles Altos (DANA, an isolated high-level depression), a meteorological phenomenon that caused severe flooding in eastern Spain in October 2024. Despite official sources denying the claim, the disinformation spread widely, illustrating the challenges of combating false narratives in digital environments. The proposed methodology involves large-scale data collection using TweetscraperR to extract relevant social media content, followed by quantitative analysis of network structures to identify key amplification patterns, influential users, and community clustering. Community detection techniques are applied to examine polarization in disinformation diffusion, while natural language processing (NLP) powered by AI is used to classify narratives, distinguishing between those spreading, debunking, or neutrally engaging with disinformation. This methodological framework provides researchers with a structured approach to studying digital disinformation dynamics, offering a scalable and replicable model applicable to various contexts. By integrating automated data collection, network analysis, and AI-driven text classification, this study demonstrates how interdisciplinary computational methods can enhance the study of disinformation and its societal impact.

SESSION 9: RESEARCH ON SOCIETAL DIGITALIZATION I Proposing a Tentative Sentiment Dictionary for Gender Analysis in Digital Communication: A Quantitative Study of Twitch Comments

David Moreno-Alameda (University of Madrid, Spain), Sandra Ramírez-Fernández (University of Madrid, Spain)

This study investigates differences in digital interaction using sentiment analysis of viewer comments on Twitch, a livestreaming platform central to the digitalization of social communication. Specifically, we examine gender-based asymmetries in the emotional tone and semantic content of messages addressed to content creators. As digital platforms democratize content production and interaction, female streamers often face unique challenges such as online harassment and sexualization, which impact visibility and

monetization. We analyze comments directed at the top 10 male and top 10 female streamers (by follower count in Spain) over a two-week period in January 2025, manually collecting and processing over 80,000 messages. While we initially applied the Spanish version of the NRC Emotion Lexicon, we found it limited in capturing the linguistic and cultural specificity of Twitch and the gendered nature of online communication. In response, we propose a first tentative sentiment dictionary tailored to this context. This tool includes memes, slang, platform-specific expressions, and gendered language, aiming to offer more accurate detection of affective content in livestreaming environments. After preprocessing and normalizing the data, we calculated word frequencies and sentiment rates per streamer. Statistical analyses (Shapiro-Wilk and Wilcoxon-Mann-Whitney tests) reveal significant gendered disparities, particularly in the prevalence of derogatory language directed at women. By introducing this initial, context-specific dictionary, the study contributes to refining quantitative approaches to digital communication and provides a basis for future tools addressing online inequalities.

Young people's perceptions about the effects of social media use on their well-being if Finland

Konsta Happonen (Finnish Youth Research Society, Finland)

The connection between well-being and social media use is a contested topic, especially when it comes to youth and children. Some blame young peoples' social media use for the increase in documented mental health disorders in recent decades, while others maintain that the effects of social media use on well-being are varied and on average small. The perceptions of young people about the effects of their social media use on their life has been studied less. Here we use a cross-sectional survey of Finnish young people aged 10–29 based on a probability sample to study the association between frequent social media use and subjective well-being. We contrast the results with what young people think the effect of their social media use on their life is. Our study highlights the many-faceted relationship young people have with social media and questions simplistic claims about social media's effects on well-being.

Measuring Media Polarization: A Majority Operator-Based Model for Information Evaluation

Pablo Pastora Estebanez (Universidad de Málaga, Spain)

Digitalization has transformed media consumption, reshaping public discourse and intensifying polarization. This study presents a novel methodological approach to measuring polarization in mass media using the Majority-Ordered Weighted Averaging (MA-OWA) operator and the Interval Rating Interpretation (IRI) model. These tools enable a more robust quantification of information bias and consensus levels in news headlines across different media outlets and thematic categories. The MA-OWA operator addresses the limitations of arithmetic means, which are highly sensitive to extreme values. By assigning weighted values based on cardinality, MA-OWA emphasizes majority opinions while preserving minority perspectives, offering a nuanced representation of information polarity. Applied to news headlines, it generates a range reflecting opinion variance: the lower half defines the minimum, while the upper half establishes the maximum. The resulting interval is then used to compute the IRI coefficient, a measure of consensus that ranges from 0 (absolute agreement) to 1 (maximum diversity). This methodological approach enhances our ability to analyze polarization in digital media landscapes. By integrating advanced aggregation techniques with interval-based assessment, it provides a scalable, quantitative framework for evaluating information consistency across media ecosystems. This methodology will be demonstrated using a dataset of 889 news headlines from Spanish newspapers (from

13/05/2024 to 30/06/2024), covering two distinct topics: the Israeli-Palestinian conflict and the Spanish judicial system. By applying the MA-OWA and IRI models, the study reveals differences in polarization patterns across these themes, showcasing the potential of computational social science in analyzing media bias and information consistency.

Cushion or catalyst? Automation risk, policy feedback and public attitudes towards AI in Europe

Jing Ning (University of International Business and Economics, China), Alex Jingwei He (The Hong Kong University of Science and Technology, Hong Kong), Ziteng Fan (Fudan University, China)

The introduction of artificial intelligence (AI) and its societal implications have become a lively public debate in recent years. While these emerging technologies can increase economic productivity and improve public service, they also have substitution effects in the labor market. While numerous studies have attempted to address this question, current discussions primarily revolve around individual and cultural factors of AI acceptance, few explore the roles of existing macro-institutions or polices in affecting public attitudes toward AI with policy feedback theory. This study investigates the formation of public attitudes towards AI in Europe, employing three waves of Eurobarometer and utilizing a multilevel regression model. This article differs from others in the use of single policy, the focus on social and regulatory policies, and modeling heterogenous effects based on labour market hierarchies. We used social expenditure relative to GDP and employment protection legislation to measure macro social and regulatory policies, respectively. Our findings reveal that individuals facing higher risks of AI-induced unemployment are generally less inclined to accept AI. However, pre-existing welfare generosity and labor market regulation can significantly moderate the relationship between automation risk and public attitudes towards AI through a policy feedback loop. Specifically, there is a self-undermining effect of welfare policy, which means social spending catalyzes robot acceptance except for routine workers. However, there is a self-reinforcing effect of regulatory policy, which decreases AI acceptance more among non-routine workers. It also means employment protection legislation narrow the gap of public attitudes towards AI between routine and non-routine workers.

Keywords: AI acceptance; automation risk; policy feedback; comparative analysis; Europe

Detecting Public Sentiment in the Age of Big Data: A Machine Learning-Based Exploration Using Open-Access Emotion Data

Hazel Ceren Erkengel (Karadeniz Technical University, Turkey)

This research builds upon a practical framework for the integration of machine learning methods into the social sciences, based on openly available text data from social media, supplemented with publicly available sentiment labels. The study used the "Emotions Dataset for NLP" available from Kaggle which describes the feelings between users of social media. Machine learning algorithms (Naive Bayes and Logistic Regression), were trained to predict sentiment. In addition, this study highlights the ability of keyword clouds in time-relevant word identification. It demonstrates how particular words and collective feelings are intertwined in a group of individuals, and how they use that information to influence the average sentiment of the community. The study reports a very high degree of accuracy when it comes to identifying key emotions - such as anger, joy, fear, and surprise - using machine learning models. This insufficiently analyzed area of research provides a technically enabled, scalable solution to gathering sensitive data for social scientists aiming to digitalize emotional data. This paper looks at how going digital and using big data can make studying quantitative analysis of social phenomena with numbers better. It also charts an individual's emotional

topography using machine learning, all the while emphasizing the transient nature of emotional states and providing new pathways for the analysis and deployment of emotional data within the social sciences.

KEYNOTE SPEECHES 3: GREEN YOUR ANALYSIS: A SUSTAINABLE USE OF AI IN QUANTITATIVE RESEARCH

Kathrin Komp-Leukkunen (LUT University, Finland); Kathrin is professor of social sustainability and welfare policies at LUT University and chair of the Research Network on Quantitative Methods. Lately, she studied especially how AI changes our working lives. Jamie Hyneman (M5 Industries, USA & LUT University, Finland); Jamie is a special effects expert and former co-host of the popular TV series MythBusters (2003-2016). He also is professor of practice at LUT University. He recently explored especially how we could combat climate change through technological advancement and social innovation. With great power comes great responsibility – as a popular saying suggests. Current discussions on Artificial Intelligence (AI) regularly underline the power that this technology might hold. In quantitative research, it is hoped to analyze larger volumes of data at a faster speed and with a higher degree of complexity. Yet, this analytical power comes at a cost. It is energy-intensive, which raises environmental concerns. Moreover, its use can sharpen social and economic inequalities between AI users and non-users. This session reflects on the responsibilities we might take on when using AI for quantitative research. First, Kathrin Komp-Leukkunen maps these responsibilities, using the Sustainable Development Goals of the United Nations as a framework. AI use in quantitative research ties in with questions of social, economic, and environmental sustainability, reshaping inequalities within and between countries. Thereby, it interferes with the fundaments of our social structures, taking on a much wider relevance than just a quest for obtaining insightful research results. Next, Jamie Hyneman raises questions about how we, as researchers, can best live up to these responsibilities. He discusses the role of researchers in society, ideas on researchers' approaches to environmental responsibility, and societal needs that push the limits of what researchers might strive for. In doing so, he reports on the Climate Innovation Coalition, which he recently co-founded. This coalition hopes to contribute to preserving the environment, using university researchers as agents of change.

WEDNESDAY, JUNE 04, 2025

SESSION 10: RESEARCH ON SOCIETAL DIGITALIZATION II Is there a digital divide in the digital divide? Age-differences in digital skills across European regions

Petteri Kolmonen (LUT University, Finland), Kathrin Komp-Leukkunen (LUT University, Finland)

It has been widely documented that societies are experiencing digital divide. The division between those who can use digital devices and those who cannot has substantial societal impacts that need to be accounted for during the continued digital transition. The digital divide has been particularly impactful for the older generations who may be at risk of falling behind the digital development, but this same phenomenon is also happening at the regional level between urban and rural areas. Our study asks if there is a digital divide within a digital divide, meaning that the disparities in digital skills between generations and regions are intersected in a manner that amplifies the effect of both of these dimensions. We utilise a Eurobarometer dataset with 21953 eligible respondents from 24 European countries to examine the level of digital skills within European regions at NUTS-2 level to compare how these regions differ in their digital know-how. We anticipate the analysis to show that the

level of digital skills declines when observing both older respondents as well as those from the more rural regions, and that there is a compounding effect for older respondents from the rural regions. This study advances the research on digital divide by highlighting the importance of intersectional approach that considers not only the age of the people but also their environment in facilitating the acquisition of experience with digital devices. Keywords: digital divide, ageing, urbanisation, technology, Europe

Simulating Alternative and Traditional Media Influence in a Fragmented Digital Landscape

Maud Reveilhac (University of Zurich, Switzerland)

The digital era has fundamentally reshaped news consumption, creating increasingly fragmented information ecosystems where traditional and alternative media compete for audience attention. While alternative news sources challenge mainstream media narratives and cultivate distinct audience communities, attitude-inconsistent media exposure is also more prevalent than previously assumed. This raises fundamental questions about how exposure to differing viewpoints influences opinion dynamics and contributes to broader societal divisions. This study presents an agent-based model where agents interact locally and adjust their media preferences based on social influence and cognitive rebalancing. Each agent has two key attributes: a media preference and a behavioral trait, representing belief consistency. At initialization, the majority of agents prefer traditional media, while a minority favors alternative sources. Social influence occurs through direct majority pressure and indirect minority persuasion, with highly consistent agents shifting the opinions of others. A key feature of the model is cognitive rebalancing, where agents experiencing dissonance between their attitudes probabilistically adjust them, guided by trust dynamics. Over time, trust in alternative or traditional media reinforces belief consistency, leading to either polarization or ideological shifts. The model tracks the proportion of agents adopting alternative media, behavioral trait distributions, and consistency levels over time. By leveraging computational simulation, social influence and cognitive theories, this research highlights how decentralized interactions shape opinion landscapes. The findings are relevant for understanding digital media fragmentation, the resilience of minority narratives, and the role of trust in shaping public discourse in an era of information competition.

Digital stress in the Austrian population: addressing its distribution and impact on subjective well-being

Christopher Etter (University of Salzburg, Austria), Anja Eder (University of Graz, Austria), Matthias Penker (University of Graz, Austria)

Current research is increasingly focusing on the harmful health-related effects of information and communication technologies (ICT), which are often summarized under the term "digital stress". Examples of digital stressors include the requirement of constant availability through ICTs, information overload and ubiquitous social comparison on social media (La Torre et al., 2019). In addition, the rapid technological development creates inequalities (e.g. across age groups) in digital skills and access to ICTs (Szatmáry & Szikora, 2023).

Previous research on digital stress has mainly focused on specific population groups, such as adolescents and older individuals or specific settings, such as the workplace (van der Schuur et al., 2019; Nimrod, 2022; Bondanini et al., 2020; Fischer et al., 2021). Insights from larger representative population surveys are mostly missing (Reinecke et al., 2017), resulting in a significant research gap when it comes to the prevalence of digital stress in societies as a whole, as well as in certain socio-demographic subgroups.

The presentation addresses this gap based on the representative "Social Survey Austria 2024" (Hadler et al., 2024) and a newly developed short scale on digital stress ("DiSt"), which was

specifically designed for the use in population surveys. The focus lies on the following two research questions: (1) To what extent do Austrians experience digital stress and are there significant differences between socio-demographic groups? (2.) What are the relationships between ICT use, digital stress and subjective well-being? These research questions are analyzed based on the theoretical concept of "digital well-being" by Büchi (2024).

Changing cultural landscapes of digital disconnection: Machine learning approach to examine Finnish discussion of digital disconnection from 1990 to 2025

Ossi Sirkka (Tampere University, Finland)

This study investigates the evolution of cultural landscapes concerning digital practices, skills, media and disconnection in Finnish society. We explore how individuals lacking digital skills are perceived and discussed during digitalization and how people reflect on their digital practices once they become integral to daily life. Utilizing an extensive dataset of Finnish news articles, blogs, social media, and forum posts from 1990 to the present, we examine changes in the understanding and discourse surrounding digital practices and disconnection. Methodologically, we employ a pretrained word2vec model trained on large Finnish language corpus and fine-tune it with our scraped dataset to better align with our specific task. We measure meaning structures and their temporal changes using Concept Mover's Distance, which formalizes relationships between documents in our corpus and focal concepts such as digital skills, exclusion, marginalization, and social media-related anxiety. This approach allows us to examine meaning-related changes over time. We hypothesize that the meanings of digital practices and social media have undergone profound changes. Initially, these topics were linked to digital skills as cultural and social resources, but over time, they have become increasingly associated with negative byproducts of digital consumption, such as social media-related anxiety, and self-help-related discussions on voluntary digital abstinence. Our findings aim to provide a comprehensive understanding of the shifting perceptions and discussions surrounding digital practices and disconnection in Finnish society, highlighting the transition from viewing digital skills as beneficial to recognizing the potential adverse effects of digital media consumption.

SESSION 11: ANALYSES OF CROSS-NATIONAL SURVEYS

Beginning of old age by employment type in Denmark: Understanding the role of retirement timing, life satisfaction, and health outcome on perceptions of the beginning of old age

Nabaraj Adhikari (LUT University, Finland)

Modern society is work-oriented, and individual life courses are structured around work. Individual work choices such as being employees or self-employed influence resulting in varying individual life courses. Life course of individuals can be divided into youth, middle age, and old age. Youth is related to education; middle age is related to work, characterized as employment; and old age is linked to retirement. The life course of employed and selfemployed varied differently as they withdraw from the labour market differently. However, no study has been conducted to explore the difference between the beginning of old age between employees and the self-employed. This study aims to answer the following questions: (i) Does the perceived beginning of old age differ between employees and selfemployed individuals in Denmark? Other factors such as life satisfaction and health outcomes shape perceptions of old age. This study answers how these factors influence relationship between employment status and beginning of old age in Denmark. Ninth round of the European Social Survey round nine data from Denmark, involving a nationwide sample of 3,212 respondents will be used to answer the questions. A multiple mediation model will be used to evaluate whether the association between employment type and the beginning of old age is mediated by perceived retirement timing, health status, and life satisfaction. Hayes PROCESS macro, developed by Andrew F. Hayes, is used to predict the relationship between employment type and the beginning of old age. Findings from this analysis will be presented during the conference.

Modeling dis/trust in government to deal with the pandemic, the impact of the pandemic on employment and COVID-19 cases on social trust: A mediation analysis based on the 2020 European Social Survey datasets for Finland and Greece

Aggeliki Yfanti (Academy of Athens, Greece)

In the literature, trust in government is considered as a crucial component for societies to function well. However, during a pandemic trust is thought of having an ambiguous effect on its outcomes. In this respect, the purpose of this study is to explore the mediating role of dis/trust in government to deal with the impact of the pandemic in the relationship between the impact of the pandemic on employment (respondent made redundant or furloughed, income and work hours reduced, unpaid vacation), COVID-19 cases and social trust. The analysis was based on the 2020 (Round 10) European Social Survey (ESS) datasets for Finland and Greece. In both countries, the separate path analysis models provided adequate model fit. In both countries, social trust was positively predicted by trust in government to deal with the impact of the coronavirus pandemic. In both countries, trust in government was positively affected by the respondents having COVID-19. In both countries, the findings showed weak mediation effects of the respondents having COVID-19 by trust in government and work hours reduced by trust in government. Moreover, the findings showed weak mediation effects of unpaid vacation by trust in government in Finland and Greece. In the case of Greece, weak mediation effects of income reduced by trust in government were observed. These results indicate that further research is necessary.

Keywords: Path analysis; Trust in government; COVID-19 pandemic; Employment; Social trust; European Social Survey (ESS)

Complementary Medicine vs. Alternative Medicine in the Digital Age: An Empirical Analysis Using ISSP 2021 Data

Juliane Heise (University of Technology Chemnitz, Germany), Alexander Helbing (University of Technology Chemnitz, Germany)

The increasing use of complementary and alternative medicine (CAM) has led to extensive discussion about the underlying factors influencing its adoption. However, existing research often fails to distinguish between complementary (used alongside conventional medicine) and substitutional (used in place of conventional medicine) practices. This study aims to investigate both forms of CAM usage by first estimating their respective prevalence and then identifying key explanatory factors. A particular focus is placed on the role of internet-based information-seeking behaviour and religious affiliation in shaping CAM usage. We argue that the increased availability of online health information enhances individuals' exposure to CAM, particularly among individuals dissatisfied with conventional medicine. Those seeking alternative health information online are more likely to develop a positive attitude toward CAM and are thus more likely to use it. Religious affiliation is considered a potential factor influencing CAM adoption, as certain belief systems may exhibit scepticism toward conventional medical approaches and favour alternative healing practices. To gain further insights, satisfaction with the healthcare system and sociodemographic variables are also considered in the analysis. To test these relationships, a discriminant analysis will be conducted using data from the International Social Survey Programme (ISSP) 2021 (N = 44.549). By integrating digital behaviour with established health determinants, our research seeks to provide a more nuanced understanding of CAM practices in the digital age. These

findings are expected to inform public health policy and contribute to the design of integrative healthcare systems that consider both traditional and modern information channels.

Comparing the measurement of Gender Roles Attitudes in large scale cross-national surveys

Malina Voicu (University of Bucharest, Romania)

Gender Role Attitudes (GRA) are key concepts in analysing family life, work life balance, fertility and the output of family policy, being often used to assess the cross-countries variation of the advancement of gender equality. However, comparing the beliefs about the appropriates roles for men and women raises methodological challenges, the existing research pointing out that the scales used by large scale surveys (ISSP, EVS, and WVS) cover only some dimensions of the GRA concept, are biased towards the traditional family model male breadwinner - female homemaker, and lack measurement invariance when used for crosscountries comparisons. This paper assesses the cross-national comparability of the GRA scale tapping the support for non-traditional gender roles such as the dual breadwinner- home maker model, based on the data coming from Gender and Generation Survey II, collected between 2020 and 2023 in 14 countries from Europe, Asia, and South America. The research employs standard Multi Group Confirmatory Factor Analysis (MGCFA), as well as Alignment Models and Monte Carlo simulation to check the measurement invariance across the 14 countries. The results of Alignment Models point out that the scale can be used to compare support for non-traditional GRA in the countries included in the analysis, providing a good alternative to the scales employed by other large-scale surveys for taping GRA.

SESSION 12: NEW DEVELOPMENTS IN DATA COLLECTION AND ANALYSIS How recruitment strategies, sources translate into data quality

Jessica Daikeler (GESIS – Leibniz Institute for the Social Sciences, Germany) This study investigates how recruitment strategies impact response quality across both probabilistic and non-probabilistic samples, positioning itself as one of the pioneering investigations into the phenomenon of "piggy-backing" surveys – where probabilistically recruited respondents are subsequently approached for additional data collections. The ongoing discourse surrounding probabilistic and non-probabilistic sampling methodologies within survey research emphasizes the critical need to comprehend how distinct recruitment tactics shape the quality of collected data. Drawing from previous literature on recruitment strategies in panel research and the implications for response quality, this study focuses on a novel panel recruited from diverse sources, including established probabilistic panel studies like GLES, Allbus, the GESIS panel, as well as social media platforms such as Facebook and Instagram, as well as a register-based source. This diverse array of recruitment sources facilitates an exploration of various factors, including satisfying response behavior. Through this comprehensive approach, the study aims to ascertain the extent to which response quality are influenced by the recruitment method, considering both probabilistic and non-probabilistic approaches.

Survey mode in the digital era: investigating measurement equivalence across mode switches using the GESIS panel.pop

Ayline Heller (GESIS – Leibniz Institute for the Social Sciences, Germany) Due to declining response rates and increasing costs, many large-scale national and international survey programs, e.g. the European Value Survey, the European Social Survey or the German General Social Survey, have been taking steps towards switching from offline, often times interviewer-administered survey modes to online, self-administered or mixedmode designs to better address the needs and habits of participants and thus increase response rates. This has sparked a debate about the effects on data quality and comparability over time, as both may be impaired even if the same mode is retained. In our study, we address a central question when it comes to mode switches: Can we meaningfully compare results from different survey modes across time, or does the response behavior in terms of the underlying measurement structure change? While first evidence from cross-sectional survey programs suggests that measurement invariance may not be an issue for most scales in this setting, we want to introduce a longitudinal investigation using data from the GESIS panel.pop. Applying multi-group confirmatory factor analysis to a scale on attitudes towards refugees, we show that measurement from both online and offline participation is equivalent across time and thus across mode switches. This finding suggest that switching from offline to online modes may be a useful tool to increase survey participation and reduce costs without impairing quality of measurement and comparability. Pitfalls beyond the measurement side of mode switches are discussed.

Exploring Opinion Polarization in Times of Crises: Insights from Combining Survey and Twitter Data

Beate Klösch (University of Graz, Austria)

This research examines the polarization of public opinion in German-speaking countries in the context of the COVID-19 pandemic and the climate crisis, focusing on the impact of policy measures. The study applies an evolving methodological approach by integrating survey data with Twitter data to provide a comprehensive understanding of opinion dynamics. The findings reveal significant variations in public opinion on both crises, with opinion polarization on COVID-19 containment measures being more pronounced than on environmental protection measures. Contrary to claims of a deep societal divide, the opinion distributions predominantly follow a single-peaked pattern rather than a bimodal one. However, a small but noticeable number of people oppose the measures related to either crisis, indicating a one-sided accumulation of polarized opinions within the broader distributions. Additionally, a small group of respondents rejects measures for both crises, which we attribute to a mistrust of the scientific consensus underlying these measures. The research further reveals consistency in opinion distributions across different data sources at both the aggregate and individual levels. However, social desirability bias is observed among respondents who share their social media data for research purposes. In conclusion, this research advances the empirical study of opinion polarization by integrating traditional survey data with Twitter data, providing a multidimensional perspective on how crises shape public opinion. Furthermore, it contributes to the methodological development of computational social science research. The complementary strengths and limitations of each data source are elaborated, emphasizing their non-interchangeability.

Apollo Meets Justitia: Predicting Civil Case Outcomes in Dutch Court Data

Jozef Patrnciak (Utrecht University, The Netherlands)

The increasing accessibility of court decisions has spurred interest in the automatic analysis of legal texts using Natural Language Processing (NLP) and Machine Learning (ML). Given the judiciary's reliance on textual data, ranging from case briefs to judicial opinions, ML models offer a promising avenue for analyzing legal documents and predicting court outcomes. These predictive models have the potential to enhance transparency, inform litigants, and support legal professionals by systematically interpreting complex legal language. However, while judicial outcome prediction has shown success in criminal and human rights cases, civil litigation presents distinct challenges. Unlike criminal cases, which typically yield binary verdicts of guilt or innocence, civil disputes often involve ambiguous

resolutions, balancing competing claims and discretionary judgments. This complexity reduces the effectiveness of conventional classification models. Previous research has demonstrated strong performance in judicial prediction tasks, particularly in structured legal contexts such as the European Court of Human Rights, where binary classifiers and deep learning models have achieved notable accuracy. However, civil litigation requires more refined approaches due to its inherent legal ambiguity. This study evaluates various ML models on a large dataset of Dutch civil court cases, examining their ability to navigate the nuances of judicial reasoning and discretionary rulings. By assessing the trade-offs between model complexity and reliability, this research contributes to the development of more effective methodologies for predicting civil case outcomes, advancing the role of ML in legal analytics, and supporting data-driven judicial decision-making.

SESSION 13: ANALYSIS OF TEXTUAL DATA

AI vs. Ageism: How LLMs Can Detect Age Bias in Job Offers

Ambroise Dobosz (Jagiellonian University, Poland)

The rapid development of Large Language Models (LLMs) in recent years has opened new opportunities for automating the analysis of extensive textual data. One of the potential applications of LLMs lies in detecting biases and discrimination in various forms of written communication, including job advertisements. Age discrimination remains a persistent issue in labor markets worldwide, subtly embedded in job advertisements through language that may discourage not only older candidates from applying, but also the youngest one. Traditional methods of detecting such biases often rely on manual annotation, rule-based approaches, or keyword searches, which might be extremely time-consuming. The introduction of LLMs provides a promising alternative, offering automated, scalable analyses of textual content. However, the accuracy and reliability of these models in detecting agerelated biases remain open questions that require systematic evaluation. In my presentation, I will provide a comparative analysis of different LLMs in their ability to detect ageism in job postings. The study involves evaluating models based on performance metrics. To ensure a robust evaluation, the study employs different LLMs of different sizes. The comparison is conducted using a diverse dataset of job offers extracted from Poland's leading job advertisement platform. The methodology includes applying each model to detect ageist language, and benchmarking their performance against human annotations.

MarxistLLM: Fine-tuning a language model with a Marxist worldview

Matti Nelimarkka (University of Helsinki, Finland & Aalto University, Finland) Recently, there has been increasing interest in using language models to examine social aspects through social science lenses. However, these models embody specific societal values and perspectives. This inherent encoding of viewpoints means that when these models are employed in social science research, scholars might not account for the biases that these cause. Alternatively, these biases could be seen as theoretical perspectives seen as a worldview (Weltanschauung), such as rational choice theory, Marxist theory, and feminist theory. To highlight potential biases with models and implications for research, and explore the opportunity to use language models for social science theory, we fine-tune large language models with a specific Weltanschauung. Specifically, we incorporate the writings of Marx and Engels to fine-tune these models, aiming to infuse them with Marxist ideological terminology and a Marxist worldview. We evaluate how these fine-tuned models differ in empirical analysis and show that affluence loses its importance with a Marxist language model, but at the same time the model is more sensitive to capitalism and economy than a standard baseline model. This investigation underscores the need to examine the values embedded in language models before they are used for social science research and highlights the opportunity to incorporate a particular theoretic stance into them.

Quantifying the Qualitative: Measuring Social Integration and Inclusion in Esports Communities through Ethnographic Data

Luis E. Andrade Silva (Universidad de Salamanca, Spain)

This paper explores the methodological challenges and potentials of quantifying ethnographic data in the study of digital communities, focusing on an Esports team at a State University of New York campus. Based on 25 semi-structured interviews and four months of participant observation, the study investigates how video games facilitate social integration, gender inclusion, and the emergence of hybrid communities across digital and physical spaces. Rather than relying exclusively on qualitative interpretation, the research applies content and lexical analysis techniques to transcribed interviews in order to quantify patterns of social interaction, group cohesion, and representations of inclusion. Using tools such as coding matrices, co-occurrence graphs, and simple statistical modeling, the paper demonstrates how ethnographic narratives can be systematically transformed into analyzable data sets. These quantified insights are then compared with observational data to triangulate findings and assess the reliability of emerging themes. The approach shows that hybrid methods—merging qualitative depth with quantitative structure—can enhance our understanding of digital socialization, particularly in fast-evolving environments like Esports. This contribution highlights the importance of developing mixed-methods strategies for researching digital societies and argues for a broader methodological dialogue between ethnography and computational social science.

Unbiased Textual Data Analysis for Measuring Societal Change: Opportunities and Challenges

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The digitalization of society has enabled large-scale textual data analysis, exemplified by the rise of Large Language Models (LLMs). Analyzing texts produced by individuals offers a window into human experiences, emotions, and viewpoints rather than just external behaviors. This allows us to track evolving societal sentiments and their alignment-or divergence-from broader trends. However, reliance on biased data sources risks distorting our understanding. I argue that population-based text collection and analysis will be crucial for unbiased societal insights. The key question then becomes: Where could unbiased textual datasets emerge? To address bias in analysis, I explore alternatives to LLMs. One such approach is FinnSurveyText, a method for analyzing open-ended survey responses without external corpora or pretrained models, ensuring transparency and interpretability. Additionally, theory-driven frameworks like PERMA-H for well-being analysis offer structured ways to extract insights from population-based text data. Potential applications include (1) healthcare & social care: identifying public well-being trends through patient and citizen feedback, (2) education: Analyzing national matriculation essays to assess youth sentiment and future expectations, (3) governance: examining organizational reports to detect societal shifts, resembling financial risk assessment, and (4) democratic processes: enabling citizens to express viewpoints in their own words rather than through multiple-choice voting. Finally, I ask: Can population-based text analysis support social forecasting, identifying societal risks before traditional indicators? By critically assessing AI-assisted text analysis, this paper advocates for a transparent, theory-driven, and ethically sound approach to digitalera social measurement.

SESSION 14: INNOVATIVE DATA ANALYSIS AND VISUALIZATION Network galleries, interactive maps and timelines for teaching: a visual history of sociology to promote knowledge of sociologists and their works

Cristina Calvo (University of Valladolid, Spain), Emilio Portela (University of Salamanca, Spain), Modesto Escobar (University of Salamanca, Spain)

This presentation introduces an innovative digital tool that uses images and interactive visual representations to explore the evolution of sociology from its origins to the present day. Through a series of dynamic web pages, the platform offers galleries of sociologists organized chronologically, timelines mapping major theoretical schools, and visual networks displaying the influence between authors and theories. The tool also includes relational databases and concept maps that link sociologists to their works, theories, and geographical contexts. This presentation aims to highlight the pedagogical value of interactive visual tools in teaching sociology, both in academic environments and socio-community learning spaces. By using visualizations, students and educators can draw connections between different theoretical currents and authors, promoting a more inclusive, participatory, and accessible approach to learning. These visual tools foster collaborative and democratic learning, encouraging dialogue and engagement among users.

Regression Graphs with Generalized Linear Models. An Empirical Application to Content Analysis

Modesto Escobar (University of Salamanca, Spain), Cristina Calvo (University of Valladolid, Spain)

This presentation proposes the use of graphs for the graphical representation of one or more regression analyses. It focuses on network graphs that facilitate the representation of relationships between quantitative and qualitative variables. This approach highlights the importance of margins and marginal effects in the interpretation of statistical models and is complemented by a critical analysis of traditional methods, especially in relation to the base category of contrast used in analysis of variance and regressions. Regression graphs allow to represent dependence models and to explore underlying structures in the models by discovering patterns not evident in other types of simpler visualizations. Through an empirical example applied to the content analysis of open-ended responses on self-definition, the effectiveness of this methodology in identifying categories with significant marginal effects is demonstrated. In short, in addition to clarifying statistical regression concepts, visual forms of social network analysis are introduced to represent and analyze multivariate data.

A chart and what's behind it: the politics of data visualisation

Eszter Katona (Eötvös Loránd University, Hungary), Anikó Gregor (Eötvös Loránd University, Hungary)

The study examines data visualization from the perspective of critical data science as a symbolic system constructing social relations. We argue that data visualizations are not merely neutral representations of quantified reality but complex linguistic and visual symbolic systems that can mediate and influence various power relations, thus functioning as political instruments. Our study is the first in the Hungarian data science and social science field to apply the tools of the critical paradigm to the ontological foundations lying behind data visualizations and their working mechanisms. Through a comprehensive synthesis of the relevant international literature and case studies, the paper details the political potential of data visualizations and the responsibility and agency that data scientists and visualization designers have in maintaining or even reducing social inequalities. The critical analysis of

data visualizations has emancipatory potential, as it can contribute to achieving social justice and revealing the ideology of dataism.

Keywords: data visualization, critical data science, politics, emancipation, dataism, data literacy, graphicacy

Unsupervised image clustering and conceptual thinking in social science research

Adeline Clarke (University of Helsinki, Finland), Matti Nelimarkka (University of Helsinki, Finland & Aalto University, Finland)

Computational social scientists are increasingly using big visual data. For exploratory and inductive work on images, social scientists are investigating the potential of unsupervised methods for image clustering. These include Bag of Visual Words, transfer learning, selfsupervised learning, and the utilisation of multimodal large language models to extract intermediate representations of image data. The k-means algorithm is commonly used to cluster results, but other clustering algorithms or topic modelling provide alternatives to this approach. While there are works which seek to contrast these alternative approaches for unsupervised image clustering, we have not yet considered whether these unsupervised methods can replicate the gold standard of the social scientist's gaze which can involve compositional interpretation, content analysis, and other qualitative techniques. Our work compares unsupervised methods with published studies which use traditional inductive methods to label images collected from social media based on theme, purpose, and content. We find that none of the proposed unsupervised methods produced clusters which are similar to the researcher-conducted annotations. The results highlight the need for further development of unsupervised image clustering approaches which better align with the depth and conceptual thinking of social science research.