

NAVIGATING A CRISIS-PRONE WORLD: ESSAYS ON SUSTAINABILITY ISSUES IN THE TOURISM AND TRANSPORT NETWORK

Universität Hamburg

Fakultät für Wirtschafts- und Sozialwissenschaften

kumulative Dissertation

Zur Erlangung der Würde der Doktorin der Wirtschafts- und
Sozialwissenschaften (Dr. rer. pol.)

(gemäß der Promotionsordnung vom 18.01.2017)

vorgelegt von

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Hamburg, 27. Februar 2025

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Datum der Disputation: 23. Juli 2025

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Danksagung

Diese kumulative Dissertation ist das Ergebnis aus drei Jahren intensiver Forschungsarbeit als wissenschaftliche Mitarbeiterin und Doktorandin am Lehrstuhl für Marketing und Innovation der Universität Hamburg. Sie umfasst sieben Studien im Bereich des nachhaltigen Tourismus und Verkehrs vor dem Hintergrund verschiedener Krisen. Mein Wunsch ist es, mit dieser Arbeit einen Beitrag zu einem nachhaltigeren Tourismussystem zu leisten.

Diese Dissertation wäre ohne die Unterstützung vieler großartiger Menschen nicht dieselbe. Ihnen allen gilt mein aufrichtiger Dank:

Zunächst möchte ich meinem Doktorvater, Professor Dr. Thorsten Teichert, herzlich danken. Er hat mir die Anfertigung dieser Dissertation überhaupt erst ermöglicht, mir sein Vertrauen geschenkt und mich stets ermutigt, meine Fähigkeiten weiterzuentwickeln und neue Kompetenzen zu erwerben. Mein besonderer Dank gilt auch Professor Dr. Dirk Ulrich Gilbert für seine Co-Betreuung, seine kontinuierliche Unterstützung sowie die Integration in das Lehrstuhlteam und die Möglichkeit, meine Forschungsvorhaben bei den Forschungskolloquien zu präsentieren. Professor Dr. Sebastian Späth danke ich dafür, dass er sich bereit erklärt hat, den Vorsitz des Prüfungsausschusses zu übernehmen.

Ein großes Dankeschön geht an meinen guten Freund, Ko-Autor und Kollegen Finn Christian Simonn – für unzählige gemeinsame Mittagspausen, das geteilte Büro, unsere erheiternden Gespräche und seinen wertvollen wissenschaftlichen, oft kritischen Input und Rat, der mich stets weiter antrieb.

Ebenso danke ich all meinen Mitautor:innen, insbesondere Professor Thorsten Teichert, Professor Florian Kock, Finn Simonn, Dr. Adnan Shah, Professor Stefan Gössling und vielen weiteren, für ihre harte Arbeit, ihre unschätzbareren Beiträge und die bereichernde Zusammenarbeit. Mein herzlicher Dank gilt weiterhin Professor Ralf Vogler, von dem ich bereits im Bachelorstudium viel über den Tourismus und das Transportwesen lernen durfte und der mich 2021 zur Promotion ermutigt hat, sowie Professor Stefan Gössling, für die spannenden Forschungsprojekte und die inspirierende und wertschätzende Zusammenarbeit.

Jenseits der Wissenschaft gilt mein tiefster Dank meinen Freund:innen und meiner Familie für ihre Geduld mit mir in stressigen Phasen und die schönen gemeinsamen Erlebnisse. Meinem liebsten Dr. Richard Kohns danke ich von Herzen: Danke, dass du so ein unglaublich unterstützender, verständnisvoller und humorvoller Lebenspartner und Dog Co-Parent bist. Und dafür, dass kein einziger Tag vergeht, an dem du mich nicht zum Lachen bringst.

Mein größter Dank aber gebührt meinen Eltern, Sigrid und Oliver Schweiggart, für ihre bedingungslose Liebe und Unterstützung. Diese Dissertation ist das unbestreitbare Ergebnis eurer unerschütterlichen Ermutigung und Engagement für die Ausbildung eurer Töchter.

List of Abbreviations

| | |
|----------|---|
| ANT | Actor-Network Theory |
| AVE | Average Variance Explained |
| CAZ | Clean Air Zones |
| CDA | Critical Discourse Analysis |
| CFA | Confirmatory Factor Analysis |
| CMB | Common Method Bias |
| COVID-19 | Coronavirus Disease 2019 |
| CR | Composite Reliability |
| DMA | Disaster Management Authorities |
| DMO | Destination Management Organisation |
| eWOM | Electronic word-of-mouth |
| GDP | Gross Domestic Product |
| HTMT | Heterotrait-Monotrait Ratio of Correlations |
| IAT | Implicit Association Test |
| LDA | Latent Dirichlet Allocation |
| LTN | Low Traffic Neighborhoods |
| NLP | Natural Language Processing |
| ONDE | Online Negative Destination Experiences |
| P2P | Peer-2-Peer |
| SCT-IAT | Single-Category Implicit Association Test |
| SEM | Structural Equation Modeling |
| SSCI | Social Science Citation Index |
| TBL | Triple bottom line |
| TDM | Transportation Demand Management |
| TF-IDF | Term Frequency-Inverse Document Frequency |
| TLI | Tucker-Lewis Index |
| ULEZ | Ultra-Low Emission Zones |
| UNWTO | United Nations World Tourism Organization |
| UTSC | Urban Transport System Change |
| VIF | Variance Inflation Factors |
| WoS | Web of Science |

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Overview on studies

Parts of this dissertation were published in research journals while one article remains to be submitted. Table 1 provides an overview over research articles.

Table 1. List of papers included in this dissertation

| No. | Study | Short title |
|-----|---|--|
| 1 | Schweiggart, N. (2024). Mapping the role of animal welfare in tourism: examining discourses in tourism research and beyond using a bibliometric co-occurrence analysis of author keywords. <i>Journal of Ecotourism</i> , 23(4), 740-767. | <i>Mapping the role of animal welfare in tourism</i> |
| 2 | Schweiggart, N., Simonn, F., & Kock, F. (2025). Tourists' Implicit Attitudes Towards Close Wildlife Interactions and the Effectiveness of an Animal-Welfare-Framed Warning Message. <i>[under review at Journal of Sustainable Tourism]</i> | <i>Tourists' attitudes towards animal activities</i> |
| 3 | Shah, A. M., & Schweiggart, N. (2023). #BoycottMurree campaign on twitter: Monitoring public response to the negative destination events during a crisis. <i>International Journal of Disaster Risk Reduction</i> , 92, 103734. | <i>#BoycottMurree campaign on twitter</i> |
| 4 | Schweiggart, N., Shah, A. M., Qayyum, A. & Jamil, R.A. (2025). Navigating negative experiences: How do they influence tourists' psychological and behavioral responses to tourism service failures on social media. <i>Asia Pacific Journal of Tourism Research</i> , 30(6), 786-808. | <i>Tourists' responses to tourism service failures</i> |
| 5 | Gössling, S., Schweiggart, N., Nieuwenhuijsen, M., McEachan, R. R. C., & Khreis, H. (2024). Urban transport system changes in the UK: In danger of populism?. <i>Cities</i> , 153, 105273. | <i>Urban transport systems change</i> |
| 6 | Teichert, T., González-Martel, C., Hernández, J. M., & Schweiggart, N. (2024). Dynamics in accommodation feature preferences: exploring the use of time series analysis of online reviews for decomposing temporal effects. <i>International Journal of Contemporary Hospitality Management</i> , 36(7), 2521-2541. | <i>Dynamics in accommodation feature preferences</i> |
| 7 | Gössling, S., & Schweiggart, N. (2022). Two years of COVID-19 and tourism: What we learned, and what we should have learned. <i>Journal of Sustainable Tourism</i> , 30(4), 915-931. | <i>Two years of Covid-19 and tourism</i> |

The following tables offer a comprehensive overview of each research paper included in this dissertation. Each table details the journal ranking, type and status of article, co-authors, methodologies, research questions, and contributions of each paper.

Study 1: Mapping the role of animal welfare in tourism



Table 2. Mapping the role of animal welfare in tourism

| | |
|------------------------------|---|
| Reference | Schweiggart, N. (2024). Mapping the role of animal welfare in tourism: examining discourses in tourism research and beyond using a bibliometric co-occurrence analysis of author keywords. <i>Journal of Ecotourism</i> , 23(4), 740-767. |
| Journal and | <i>Journal of Ecotourism</i> |
| Ranking | ABDC Journal Quality List 2022: B |
| Type | Completed and published research paper |
| Co-Authors | n.a. (single-author paper) |
| Methodology | Bibliometric co-occurrence analysis of author keywords of 405 publications Explorative factor analysis (EFA) |
| Research questions | How is the concept of animal welfare treated within tourism-related research? What are the dominant discourses and research streams surrounding animal welfare in the context of tourism? What are the gaps in existing tourism-related research? |
| Research contribution | The first study to systematically analyze the status quo of the discussions on animal welfare within tourism research. Provides interdisciplinary insights by including findings from research fields outside of tourism. Concludes that tourism has a variety of (negative) welfare effects on animals and biodiversity, that remain ignored in tourism research. Identifies four main research streams. Emphasizes the importance of addressing moral and ethical considerations in using animals for tourism. |
| Miscellaneous | Presented at the German Society for Tourism Research conference 2023 (Jahrestagung of Deutschen Gesellschaft für Tourismusforschung (DGT)) |

Study 2: Tourists' attitudes towards animal activities



Table 3. Tourists' attitudes with animal activities

| | |
|------------------------------|---|
| Reference | Schweiggart, N., Simonn, F., & Kock, F. (2025). Tourists' Implicit Attitudes Towards Close Wildlife Interactions and the Effectiveness of an Animal-Welfare-Framed Warning Message |
| Journal and | Under review at <i>Journal of Sustainable Tourism</i> |
| Ranking | ABDC Journal Quality List 2022: A* |
| Type | Submitted research paper |
| Co-Authors | Finn Christian Simonn: Doctoral candidate, University of Hamburg Florian Kock: Professor, Copenhagen Business School |
| Methodology | Single Category-Implicit Association Test and Survey measuring implicit and explicit attitudes of 1,219 respondents on close animal interactions in tourism. Correlation analysis, T-tests |
| Research questions | What are tourists' implicit and explicit attitudes toward close wildlife interactions (e.g., tiger petting)? To what extent can a warning message highlighting negative animal welfare effects influence these attitudes? How are these attitudes connected to covariates such as gender and attitudes towards animals? |
| Research contribution | Challenges the assumption that tourists inherently possess positive attitudes towards close wildlife interactions; highlights the importance of contextual factors. Shows how a warning message highlighting negative animal welfare impacts significantly decreases explicit and implicit attitudes. Uncovers a negative correlation between attitudes towards animals and both implicit and explicit attitudes towards close wildlife interactions. Identifies notable gender differences, showing that women are more susceptible to attitude change than men. Underlines that implicit attitudes are not stable, but can be influenced by contextual factors, enabling the attitude change in visitors to make more informed decisions with regards to animal welfare. |
| Miscellaneous | Research concept presented at the annual meeting of the Network of Emerging Scholars in Tourism (NEST), April 2024, Copenhagen |

Study 3: #BoycottMurree campaign on Twitter



Table 4. #BoycottMurree campaign on Twitter

| | |
|------------------------------|---|
| Reference | Shah, A. M., & Schweiggart, N. (2023). #BoycottMurree campaign on twitter: Monitoring public response to the negative destination events during a crisis. <i>International Journal of Disaster Risk Reduction</i> , 92, 103734. |
| Journal and | <i>International Journal of Disaster Risk Reduction</i> |
| Ranking | ABDC Journal Quality List 2022: A |
| Type | Completed and published research paper |
| Co-Authors | Adnan Muhammad Shah: Postdoctoral Researcher, University of Hamburg |
| Methodology | Text mining as a combination of topic modeling and sentiment analysis to 89,897 tweets |
| Research questions | What are the core topics of public discussions on Twitter and their temporal dynamics in the face of an unethical destination crisis? Do public sentiments towards the destination change during the different stages of the crisis? |
| Research contribution | Analyzes public sentiments through Twitter discussions. Demonstrates the utility of social media data for understanding public reactions and emotions throughout different stages of a crisis. Stresses the importance of monitoring social media to gauge public sentiment and manage the destination reputation effectively. |

Study 4: Tourists' responses to tourism service failures



Table 5. Tourists' responses to tourism service failures

| | |
|------------------------------|---|
| Reference | Navigating Negative Experiences: How Do They Influence Tourists' Psychological and Behavioral Responses to Tourism Service Failures on Social Media. <i>Asia Pacific Journal of Tourism Research</i> . https://doi.org/10.1080/10941665.2025.2471492 (in production) |
| Journal and | <i>Asia Pacific Journal of Tourism Research (APJTR)</i> |
| Ranking | ABDC Journal Quality List 2022: A |
| Type | Accepted for publication; in production |
| Co-Authors | Adnan Muhammad Shah: Postdoctoral Researcher, University of Hamburg Abdul Qayyum: Associate Professor, Riphah International University Islamabad, Pakistan Raja Ahmed Jamil: PhD, University of Haripur, Pakistan |
| Methodology | Quantitative surveying among 307 domestic tourists in Pakistan Structural Equation Modelling (SEM) and hypothesis testing Moderation/mediation analysis Confirmatory Factor Analysis (CFA) |
| Research questions | How do unethical destination service failures affect tourists' psychological (perceived betrayal, anger) and behavioral outcomes (e.g., boycott intention, revenge, forbearance)? Does the quality of the tourist-destination relationship moderate the effects of negative experiences on emotional and behavioral responses? |
| Research contribution | Advances the understanding of emotional processes following unethical service failures by highlighting how feelings of betrayal and anger mediate the effects of negative experiences on behaviors such as boycott intentions and seeking revenge. Demonstrates that strong tourist-destination relationships can mitigate negative emotional reactions and influence subsequent behaviors, providing a nuanced view of crisis response strategies in the tourism context. |

Study 5: Urban transport systems change



Table 6. Urban transport systems change

| | |
|------------------------------|---|
| Reference | Gössling, S., Schweiggart, N., Nieuwenhuijsen, M., McEachan, R. R. C., & Kkreis, H. (2024). Urban transport system changes in the UK: In danger of populism?. <i>Cities</i> , 153, 105273. |
| Journal and | ABDC Journal Quality List 2022: n.a. |
| Ranking | Journal Citation Reports JCR 2023: Q1, 94.2 JIF percentile (<i>Urban Studies</i> category) |
| Type | Completed and published research paper |
| Co-Authors | <p>Stefan Gössling: Professor at Linnaeus University, Western Norway Research Institute</p> <p>Mark Nieuwenhuijsen: Research Professor and Institute Director at ISGlobal Barcelona Institute for Global Health, Barcelona, Spain; Universitat Pompeu Fabra, Barcelona, Spain</p> <p>Rosie McEachan: Professor, Bradford Institute for Health Research, Bradford Teaching Hospitals NHS Foundation Trust, Bradford, UK</p> <p>Haneen Kkreis: Senior Research Associate, University of Cambridge, UK</p> |
| Methodology | Discourse analysis on social media threads |
| Research questions | <p>How do populist discourses shape public opposition to urban transport reforms aimed at promoting sustainability and reducing pollution?</p> <p>What discursive strategies do populist groups employ to frame urban transport changes as elite-driven and anti-democratic?</p> <p>How do emotional, social, and economic fears associated with these transport reforms influence public sentiment and resistance to sustainable transport initiatives?</p> |
| Research contribution | <p>Investigates public responses to urban transport reforms, offering insights into the dynamics of populism and public opposition in the context of sustainability.</p> <p>Reveals the central role of populist narratives and emotional appeals in framing opposition to policies such as Clean Air Zones, illustrating how such narratives foster a divide between “the people” and “the elite”.</p> <p>Underscores the importance of understanding the societal polarization surrounding urban transport reforms.</p> <p>Provides practical implications for policymakers, including the need to develop more inclusive communication strategies to promote acceptance.</p> |

Study 6: Dynamics in accommodation feature preference



Table 7. Dynamics in accommodation feature preference.

| | |
|------------------------------|---|
| Reference | Teichert, T., González-Martel, C., Hernández, J. M., & Schweiggart, N. (2024). Dynamics in accommodation feature preferences: exploring the use of time series analysis of online reviews for decomposing temporal effects. <i>International Journal of Contemporary Hospitality Management</i> , 36(7), 2521-2541. |
| Journal and | International Journal of Contemporary Hospitality Management |
| Ranking | ABDC Journal Quality List 2022: A |
| Type | Completed and published research paper |
| Co-Authors | Thorsten Teichert: Professor, University of Hamburg Christian González-Martel: Assistant Professor, University of Las Palmas de Gran Canaria Juan M. Hernández: Associate Professor, University of Las Palmas de Gran Canaria |
| Methodology | Analysis of traveler reviews; Text mining; Time Series Analysis (seasonal trend decomposition STL) |
| Research questions | (How) do travelers' preferences for accommodation features change over time, particularly regarding seasonal, trend, and disruptive effects (such as the Covid-19 pandemic)? What are the distinct seasonal patterns for different accommodation features? Is there a long-term impact of the pandemic on travelers' preferences for individual features? |
| Research contribution | Presents a novel application of time series analysis, providing a methodological advancement in understanding how reviews can be mined. Reveals that accommodation features exhibit distinct seasonal patterns that peak during various times of the year. Demonstrates that the Covid-19 pandemic had significant short-term disruptive effects on travelers' preferences but does not indicate long-term changes. |

Study 7: Two years of Covid-19 and tourism



Table 8. Two years of Covid-19 and tourism

| | |
|------------------------------|--|
| Reference | Gössling, S., & Schweiggart, N. (2022). Two years of COVID-19 and tourism: What we learned, and what we should have learned. <i>Journal of Sustainable Tourism</i> , 30(4), 915-931. |
| Journal and | Journal of Sustainable Tourism |
| Ranking | ABDC Journal Quality List 2022: A* |
| Type | Completed and published research paper |
| Co-Authors | Stefan Gössling, Professor at Linnaeus University and Lund University, Western Norway Research Institute |
| Methodology | Content analysis of academic papers and media articles on the management of the Covid-19 pandemic with focus on tourism industry effects as well as implications for the management of the climate crisis. The sample includes papers published between April 2020 and September 2021 (n = 1,953), accessed through Google Scholar (citation tracking function). |
| Research questions | Which lessons can be learned from the Covid-19 pandemic that can be applied to address and manage the climate crisis? How has the pandemic affected the global tourism industry and what vulnerabilities have emerged due to its impacts? In what ways can the responses to the pandemic inform future strategies for sustainable tourism and effective crisis management? |
| Research contribution | Argues that the Covid-19 pandemic should be viewed as an analogue to climate change, highlighting that both crises share characteristics such as unpredictability, long-lasting impacts on society, and the need for proactive management strategies. Demonstrates why a return to pre-pandemic conditions is undesirable. Illustrates the potential negative consequences of ad-hoc reactions to crises. Suggests that lessons learned from the pandemic regarding governance and public trust can have significant implications for climate crisis management. Sheds light on how short-term stabilization efforts during the pandemic may lead to neglecting longer-term climate challenges. Underscores the importance of adopting a cooperative and anticipatory approach to crisis management in tourism. |
| Miscellaneous | Was awarded "#1 Most read paper 2022" in <i>Journal of Sustainable Tourism</i> (19,600 views, 241 citations in Google Scholar) |

0 Introduction and Research context

0.1 Introduction

In recent years, the tourism and transport industries have faced significant and unprecedented challenges due to several global crises, most notably the Covid-19 pandemic and the ongoing climate and biodiversity crisis. As highly interconnected and crisis-prone sectors, tourism and transport are particularly susceptible to external shocks, ranging from climate change (Scott et al., 2019), epidemic outbreaks like Covid-19, SARS, or H1N1 (Fong et al., 2021; González-Torres et al., 2021; Gössling, Scott, et al., 2020), or the threat of terrorism (Avraham, 2021; Liu & Pratt, 2017). Most prominently however, the onset of the Covid-19 pandemic in early 2020 led to unprecedented travel restrictions and a sharp decline in international tourism (Yang et al., 2021). Lockdowns, border closures, and the ensuing economic downturn led to substantial losses for airlines, hotels, and related sectors (Abdelsalam et al., 2023; Hall et al., 2020; Seyfi et al., 2023). This crisis compelled the industry to rapidly adapt (Breier et al., 2021; Giousmpasoglou et al., 2021). As a second major global crisis, climate change and associated biodiversity crisis have intensified the challenges facing the industry, leading to a heightened need for sustainable and resilient tourism practices (Dogru et al., 2019; Gössling & Higham, 2021; Scott & Gössling, 2022).

These crises do not occur in isolation but rather intersect, creating complex ripple effects that influence consumer behavior, industry practices, and policy responses. Both crises have served as catalysts, accelerating partial shifts in consumer behavior and norms (Gössling, Humpe, et al., 2020), and fostering a renewed focus on responsible tourism, while simultaneously triggering increased mobility through “last-chance tourism” (Denley et al., 2020). The response and preparedness of the tourism industry to crises of such scales has been a longstanding concern of tourism scholars (Hall, 2010).

Apart from global crises, smaller-scale crises can be equally detrimental to the tourism industry on a local level, as e. g. shown in the #BoycottMurree incident. Crises that occur on a smaller scale, represented in single destination incidents, often sparking lively (online) debates, activism and boycotts (Seyfi et al., 2024; Shaheer et al., 2022) that can lead to heavy repercussions for tourism businesses and that need to adequate management.

Using these crises as case examples, this dissertation explores sustainability challenges in tourism and transport through the lens of crisis adaption. It examines how industry actors – including businesses, policymakers, and consumers – respond to disruptions, navigate

uncertainty, and attempt to build resilience. Drawing on seven distinct studies, the dissertation adopts a multi-dimensional approach to sustainability by incorporating economic, environmental, and social perspectives within the Triple Bottom Line framework.

The research is structured around three key questions:

1. Who are the key actors in tourism and transport crises, and how do they interact?
2. How do these crises affect industry stakeholders and consumer behavior?
3. What strategies do actors employ to mitigate negative impacts and foster resilience?

To address these questions, the dissertation employs both quantitative and qualitative methodologies, including bibliometric analyses, sentiment analysis, experimental designs, and time-series modeling. Each study contributes to a broader understanding of sustainability in tourism and transport by investigating specific crises contexts:

The first two studies examine the role of animal welfare in tourism, revealing ethical dilemmas and the potential of awareness campaigns to shift consumer behavior. The third and fourth studies explore consumer responses to immoral service failures, particularly in the context of social media activism and boycotts, as exemplified by the #BoycottMurree case. The fifth study investigates how populist narratives hinder sustainable urban transport reforms, highlighting the role of public perception in shaping policy acceptance. The sixth study investigates how consumer accommodation preferences evolved during the Covid-19 pandemic, using time-series analysis to assess long-term shifts. The final study reflects on lessons from the pandemic for future tourism resilience, drawing parallels between Covid-19 and climate crisis management.

The dissertation applies Actor-Network Theory as a unifying theoretical lens, emphasizing the dynamic interactions between human and non-human actors in tourism and transport networks. By doing so, it contributes to a deeper understanding of how crises reconfigure relationships, influence decision-making, and create new challenges for sustainable development.

In sum, the dissertation provides a comprehensive exploration of crisis adaption in tourism and transport, offering both theoretical insights and practical implications for sustainable industry practices. The findings highlight the need for systemic change, proactive policy interventions, and interdisciplinary approaches to crisis resilience.

0.2 Overview of theory and research context

Using individual case studies, this dissertation examines how various actors within the tourism and transport network respond to selected crises. To capture different scales of crises, the studies consider global challenges such as the Covid-19 pandemic and climate change, alongside regional crises, including immoral service failures and animal abuse. The effects of these crises are analyzed across multiple stakeholder groups within the tourism network, including academia, managers, tourists, policymakers, and the broader network.

While each research study adopts a case-specific perspective with its own theoretical framework, the results and overall synopsis are interpreted through the lens of Actor-Network Theory (ANT) to provide a unifying analytical framework, enabling a cohesive narrative across the studies by examining how these crises intersect with the three dimensions of the Triple Bottom Line of sustainability. ANT serves as a tool to analyze how different actors within tourism and transport systems respond to crises and how these crises reconfigure actor relationships. This is further detailed in Table 9, which categorizes the included articles by crisis type, sustainability dimension, and the specific actors under investigation.

The subsequent chapters are structured as follows: First, the crises under examination are introduced (Section 0.2.1), followed by an explanation of the Sustainability Triple Bottom Line (Section 0.2.2) and an overview of Actor-Network Theory (ANT) as the guiding theoretical framework (Section 0.2.3). Chapters 1 to 7 present the articles in full length. The dissertation then concludes with a synopsis in Chapter 8.

It is important to note that, while this dissertation inherently engages with crisis management literature, its primary objective is not to provide concrete operative crisis management recommendations. Instead, it seeks to derive exemplary insights from the case studies, examining how different actors respond to the selected crises and identifying key considerations for the future development of tourism and transport networks.

Table 9. Overview over dissertation studies and their foci.

| Dissertation studies | | Crisis | | | | TBL pillar | | | Actor focus |
|----------------------|---|----------|----------------|-------------------------------|----------------------------|------------|---------------|----------|--|
| No. | Short title | Covid-19 | Climate change | Biodiversity & Animal welfare | Unethical service failures | Social | Environmental | Economic | |
| P1 | Mapping the role of animal welfare in tourism | | X | X | | X | X | | Academia |
| P2 | Tourists' attitudes towards animal activitites | | | X | | X | | | Tourists |
| P3 | BoycottMurree campaign on twitter | | | | X | X | | | Destination managers, Service provider, tourists |
| P4 | Tourists' responses to tourism service failures | | | | X | X | | | Tourists |
| P5 | Urban transport systems change | | X | | | X | X | X | Public |
| P6 | Dynamics in accommodation feature preferences | X | | | | | | X | Tourists, accommodation managers |
| P7 | Two years of Covid-19 | X | X | | | X | X | X | Network |

0.2.1 Crisis dimensions in the tourism and transportation network

0.2.1.1 Defining crises and resilience

By definition, a crisis is a significant and sudden event or situation that poses a threat to the stability and functioning of a system, organization, or community (Boin & 't Hart, 2007). These situations are often unexpected, undesirable, unimaginable, and, at some points, perceived as unmanageable (Hewitt, 2019). A crisis can also be described as a situation where a group (an organization, a community, a nation) recognizes an imminent threat to its fundamental values or essential functions, requiring resolution amidst uncertainty (Rosenthal et al., 2001). Hence, crises typically require urgent action to avoid potential harm, damage, or considerable changes in circumstances (Boin & 't Hart, 2007).

This aligns with broader crisis management and sociological literature, which frames crises as systemic disruptions requiring urgent, coordinated responses (Boin et al., 2005; Rosenthal et al., 2001). In organizational contexts, crises disrupt sensemaking and established routines, challenging leaders to adapt rapidly (Weick, 1993). Furthermore, the progression of crises can be conceptualized through structured models (Fink, 1986), as utilized in Paper 3, and understood as opportunities for resilience and transformation (Alexander, 2013). Effective communication is also central, as it shapes stakeholder perceptions and the potential for organizational recovery (Coombs, 2007).

While the term “crisis” is often used synonymously with large-scale events such as the global financial crisis, the Covid-19 pandemic, and ecological crises such as climate change, it can also refer to structural or individual issues, e.g., local humanitarian crises arising from a particular event. Crises thus exist in various scales and in overlapping forms in complex, entangled and mutually reinforcing ways (Hopkins, 2021). Crisis can be defined through their dimensions, i.e., *temporalities* (i.e., at what timescales, with what frequency?), *spatialities* (i.e., where, or at what scale(s) are the effects experienced? How is place produced through crisis?), *intensities* (i.e., how grave and/or intense are the impacts?), differentiated *impacts* (i.e., which (part of) populations or communities are impacted most?), *exacerbating factors* (i.e., what makes impacts worse for some?), and *intersections* (i.e., in what ways do crises layer upon or intersect with one another?) (Hopkins, 2021, p. 1424f.).

A crisis is often seen as a condition that results in the time “before” (on the assumption of a non-crisis) and a hypothesized “after” (Hopkins, 2021). With the exception of the climate crisis, most crises in tourism are of specific duration (*temporalities*) that is identifiable in terms of time and space, even though their impacts may persist for longer (Hall, 2010). Such crises

traditionally receive more media attention and create an immediate sense of concern and urgency (Smith, 1990, 2005; Greening & Johnson, 2007); conversely, crises occurring on an ongoing basis, such as the climate crisis, are often not perceived with the same urgency unless specific stakeholders are impacted by it (Hall, 2010; Perkiss, 2024; Schäfer & Painter, 2021) (*intensities*).

In terms of *spatiality*, crises can be confined to a certain area within a city or country, shared across several countries, or characterized by connections that link distant regions of the world. Some crises may be static and are understood as “happening in places”, such as tornadoes, hurricanes, or flooding (Hopkins, 2021). In contrast, ongoing, global events such as the climate crisis typically are often perceived with a temporal and spatial distance of negative impacts (i.e., increased frequency and magnitude of extreme events); this phenomenon can partially explain why publics are unable to perceive climate risk (Hopkins, 2021), underlining how proximity of potential effects may severely (negatively) impact risk perception (Hopkins, 2021). Lastly, some crises exhibit mobile characteristics, such as refugee crises (Mostafanezhad et al., 2020) or the spread of the Coronavirus (Cresswell, 2021; Lin & Yeoh, 2021).

As a central characteristic, crises most often are *intersected* and not discrete (Hopkins, 2021; Ren, 2000): As an example, the Covid-19 pandemic was both intensified by the climate crisis (Newell & Dale, 2021; Zang et al., 2021) and has in turn impacted industry organizations, governments, international tourism and national economies globally (Plzáková & Smeral, 2022; Scarlett, 2021), heavily affecting already vulnerable global financial markets (Ito, 2020; Wullweber, 2020). Historically, crisis incidents have also proven to provide opportunity for violating human rights and exploiting individuals or groups for economic advantage (Higgins-Desbiolles, 2021; Mandic, 2017; Yousaf et al., 2021). At the same time, some stakeholders may leave the crisis as “winners”: For example, domestic tourism and camping tourism are reported to have received significant growth in the summer of 2020, being perceived as a relatively “safer” option during the pandemic (*ibid*). In this context, many argue that the standstill caused by the Covid-19 crisis should serve as an opportunity for the tourism industry to foster positive change, embracing adaptation and “building back better” by reflecting on issues such as sustainability and overtourism (Ioannides & Gyimóthy, 2020; Koh, 2020; Prayag, 2020).

Resilience has emerged as a central concept in crisis studies, offering a framework for understanding how systems, organizations, and communities navigate, adapt to, and recover from disruptive events. In academic literature, resilience is commonly defined as the capacity to anticipate, absorb, adapt to, and recover from adverse shocks while maintaining or rapidly

restoring essential functions (Boin & van Eeten, 2013). This conceptualization positions resilience not as a static attribute but as a dynamic process, encompassing both proactive (planned) and reactive (adaptive) strategies (Alexander, 2013).

Scholars distinguish between various pathways of resilience: the ability to “bounce back” to a pre-crisis state, to “bounce beyond” by transforming in response to adversity, or, conversely, to “bounce less” when recovery is incomplete (Boin & van Eeten, 2013). Recent research further highlights the potential for organizations and communities to “bounce boom,” surpassing their prior performance through innovation and learning catalyzed by crisis (Kraus et al., 2023). The Covid-19 pandemic has underscored the importance of embedding resilience at multiple levels - individual, organizational, and systemic - through proactive planning, continuous learning, and open innovation (Paeffgen, 2022). As such, resilience is now widely regarded as both a normative goal and a practical necessity for organizations facing recurrent or overlapping crises.

Key factors underpinning resilience include organizational adaptability, resourcefulness, effective leadership, and the capacity for collective sensemaking (Boin & van Eeten, 2013; Kraus et al., 2023). Collaborative networks and stakeholder engagement are also critical, particularly in complex or uncertain environments (Alexander, 2013). In the context of tourism and beyond, resilience is increasingly linked to the ability to not only recover but also to innovate and transform business models to enhance long-term sustainability (Prayag, 2020).

Collectively, the crises in the foreground of this dissertation can be roughly described in two scales: (1) The global crises (Covid-19 pandemic, climate and biodiversity crisis) and (2) regional crises (immoral service failure as case example); both are briefly described in the subsequent chapters.

0.2.1.2 Global crises

Climate and biodiversity crisis. The *climate crisis* refers to the significant and lasting change in global climate patterns, particularly the human-made increase in average global temperatures due to elevated levels of greenhouse gases, such as carbon dioxide (CO₂), in the atmosphere (Archer & Rahmstorf, 2010). Undisputedly, this phenomenon is driving far-reaching effects globally, including, but not limited to, more frequent and severe weather events (Ebi et al., 2021), rising sea levels (Bindoff et al., 2007), and changes in biodiversity (Rinawati et al., 2013). These environmental shifts present substantial and urgent challenges to the tourism industry. Unpredictable weather patterns can severely disrupt travel plans, deter tourists, and strain already limited local resources, posing a direct threat to the viability of tourism in affected

areas. In mountainous regions of the Alps, the warming climate leads to reduced snowfall and shorter winter sports seasons (Steiger & Abegg, 2018). In other parts of the world, extreme weather events, heat, and flooding significantly affect the often developing economies dependent on these tourist activities (Scott et al., 2012). The increased frequency of wildfires, droughts, and heatwaves not only deters travel due to heightened safety concerns but also exacerbates the vulnerability of local environments (Belias et al., 2022; Dogru et al., 2019). Despite efforts by the tourism sector to prioritize sustainable practices and encourage eco-friendly travel, the scale and urgency of the climate crisis demand more immediate and systemic responses to truly mitigate its profound impacts (Scott, 2024).

Public pressure for more sustainable practices has influenced companies to adopt greener practices, but widespread adoption is hampered by economic interests and the slow pace of regulatory enforcement (Bromley-Trujillo & Poe, 2020). Despite international efforts like the “Paris Agreement”, climate scientists warn that the current trajectory of global emissions reductions is insufficient to meet the critical target of limiting temperature rise to 1.5 degrees Celsius, as cautioned by Scott et al. (2024, p. 1737): “The window of opportunity for incremental change has passed and the case for ambitious and urgent whole-of-society mitigation is made in the most unambiguous terms.”

Intricately linked to the climate crisis is the resulting biodiversity crisis, with rising global temperatures and altered weather patterns exacerbating habitat loss and species extinction rates at an alarming pace (IPBES, 2019). As ecosystems destabilize due to climate change, the already vulnerable and endangered species face increased pressures from shifting habitats, food scarcity, and invasive species, compounding the challenges of conservation efforts (Díaz et al., 2019). Moreover, the decline in biodiversity undermines the resilience of ecosystems, reducing their ability to adapt to climate change and ultimately threatening essential services that support human livelihoods and tourism industries alike (Oliver et al., 2015). The urgency to address the critical gap in theory and practice has never been greater. Over the past 50 years, more than 60 % of the world’s wildlife has disappeared (Grooten & Almond, 2018).

This development is aggravated by illegal and often unregulated wildlife trade (Terraube & Fernández-Llamazares, 2020), worth billions of dollars annually (Morton et al., 2021), leading to negative biodiversity outcomes and the risk of zoonotic diseases (Terraube & Fernández-Llamazares, 2020). Studies found that species abundance declines, on average, by 62% in places where wildlife trade occurs, risking complete species extinction (Morton et al., 2021). More than one billion wild animals live in captivity, many of them sourced from the wild

(Schmidt-Burbach et al., 2015). Some scholars argue that Earth has entered a sixth mass extinction event (Cowie et al., 2022), commonly referred to as the Anthropocene (Thomsen et al., 2023). Ironically, while tourism is heavily reliant on thriving ecosystems and wildlife, many tourism activities directly contribute to biodiversity loss (Chorney et al., 2022; Tolvanen & Kangas, 2016). There are evident links between tourism and international wildlife trade in countries with high levels of biodiversity and high numbers of international tourists (Chavez et al., 2024). Practices such as tiger petting, elephant riding, and koala cuddling often involve sourcing animals from the wild (Schmidt-Burbach et al., 2015), exacerbating habitat destruction and species decline. Despite their detrimental impact, these activities remain highly popular among global travelers (Mkono & Hughes), highlighting the paradox of tourism's role in both exploiting and wanting to conserve biodiversity and the natural aesthetics of landscapes.

While becoming more aware of climate change implications, tourists and the broader public often face challenges in translating awareness into substantive action due to socio-economic and educational constraints as well as cultural inertia (Knight, 2016). On the one hand, concerns about the climate catastrophe have urged many governments to take action in form of implementing pro-environmental policies (Blanchard et al., 2023; Shah et al., 2021). On the other hand, global mobility and transport emission are on the rise at an alarming pace and evidence suggest a continued growth mindset in the industry (Gössling & Lyle, 2021; Hasan et al., 2021; Kazancoglu et al., 2021; Sun et al., 2022).

Covid-19 pandemic. The *Covid-19 pandemic*¹, which emerged in late 2019 first in the city of Wuhan, China, has been a profoundly disruptive global event (Brodeur et al., 2021), affecting nearly every aspect of societies globally. As the virus, medically called *severe acute respiratory syndrome coronavirus 2* or *SARS-CoV-2*, spread rapidly across all continents, governments implemented unprecedented public health measures, including lockdowns, social distancing, and travel restrictions, to curb its transmission (Benke et al., 2020). These measures, while necessary for public health, had sweeping economic and social ramifications (Brodeur et al., 2021). By the end of November 2020, close to 63 million reported cases of Covid-19 and over

¹ Note: The orthography of “Covid-19” differs within the studies to match journal conventions – all refer to the same phenomenon. According to the Merriam Webster Dictionary the following styles are acceptable: “COVID-19”, “COVID”, “Covid”, “Covid-19”, or “covid”, “covid-19” (Merriam Webster, n.d.).

1.4 million deaths had been reported (Brodeur et al., 2021). While pandemics have been known for centuries, the effects of the Covid-19 pandemic had dimensions that were previously unheard-of (Brodeur et al., 2021). The pandemic exposed and exacerbated existing vulnerabilities in healthcare systems, deepened social inequalities, and led to significant mental health challenges worldwide (Banerjee et al., 2021; Oliveira et al., 2022; Stok et al., 2021).

As a sector inherently relying on mobility, the tourism and transport industry was one of the hardest hit sectors (Gössling, Scott, et al., 2020). With borders closed and flights grounded, international travel came to a near standstill for several months (Gössling, Scott, et al., 2020). Tourist destinations across the globe experienced dramatic declines in visitor numbers and GDP (Figini & Patuelli, 2022; Fotiadis et al., 2021; Gössling & Schweiggart, 2022), leading to substantial financial losses (Škare et al., 2021), business closures, and job cuts (Gössling, Scott, et al., 2020; Sun, Li, et al., 2022). This forced the industry to innovate and pivot, hastening the adoption of digital technologies and prompting a reevaluation of traditional business models (Iskender et al., 2024).

The pandemic also altered the experiences and behaviors of travelers worldwide. As borders closed and physical travel became drastically limited, most travelers were forced to cancel or postpone their plans, leading to widespread disillusionment and frustration (Seyfi et al., 2023). The uncertainty surrounding the further development of the pandemic prompted heightened caution among travelers (Tu et al., 2023; Zenker et al., 2021), with health and safety becoming paramount concerns. As restrictions evolved, those who resumed traveling encountered a vastly different landscape with mandatory health screenings, quarantine requirements, and stringent hygiene protocols (Flaherty et al., 2022; Gössling, Scott, et al., 2020), challenging the spontaneity and freedom traditionally associated with travel (Sager, 2014). These impacts extended beyond logistical disruptions, temporarily shaping traveler preferences by increasing interest in nature-based, rural, and less-crowded destinations, where physical distancing was more feasible (Moya Calderón et al., 2022). This period also exposed the fragility of global connectivity (Gössling, Scott, et al., 2020) while fostering a heightened appreciation for the privilege of travel among many individuals (Gyimóthy et al., 2022).

Finally, the pandemic had sparked a lively discourse on the need for more sustainable and resilient tourism (Gössling, Scott, et al., 2020; Higgins-Desbiolles, 2021), with an increased focus on domestic travel and localized experiences, whereby many called for a drastic paradigm shift (to “seize the moment”) towards more sustainable practices (Ioannides & Gyimóthy, 2020; Koh, 2020; Prayag, 2020) and for a cultivation of hope (Mostafanezhad, 2020). This

transformative period for tourism highlighted the industry's dependency on global mobility and underscored the need for adaptive strategies to manage future crises (Renaud, 2020; Viana-Lora et al., 2023; Yu et al., 2023).

0.2.1.3 Regional crises: The #BoycottMurree movement

As an example of regional crises, this dissertation investigates the #BoycottMurree movement, which emerged in response to a series of distressing and immoral² incidents that occurred during the winter of 2022 in Murree, a popular hill destination in Pakistan. Touted for its picturesque landscapes, Murree experienced an unprecedented influx of visitors during the peak winter season, leading to overcrowding and a subsequent crisis fueled by heavy snowfall. On 7 January 2022, approximately 1.2 meters of new snow attracted hundreds of thousand domestic tourists eager to view the snow to the hill destination of Murree. However, the snowfall, combined with traffic mismanagement by the authorities, trapped thousands of vehicles in the area, leaving tourists stranded for hours over night in frigid temperatures of negative 8 degrees. The local authorities struggled to manage the chaos, and the resulting lack of timely assistance further exacerbated the situation. According to media reports, hotel owners had taken advantage of the situation by spontaneously raising accommodation rates from usually 30-50 USD to much as 350 USD (Wion, 2022). As a tragic consequence, 23 tourists, including 10 children, lost their lives due to hypothermia and carbon monoxide poisoning after being trapped in their vehicles for extended periods.

The tragedy then gained widespread attention when social media users began sharing harrowing accounts of their own experiences in Murree, accompanied by images and videos depicting the dire conditions faced by stranded tourists and the inadequate response from government officials. The anger and frustration among netizens culminated in the #BoycottMurree hashtag, which quickly gained traction across various platforms, as people expressed their discontent not only for the mismanagement of the crisis but also for what they perceived as a growing

² In the context of this dissertation, “immoral” refers to actions, behaviors, or principles that are considered wrong, unethical, or contrary to accepted moral standards. It implies a violation of societal, cultural, or personal codes of ethics. Examples of immoral behavior are deception, exploitation, harm to others, or breach of trust. From an ethical perspective, Kant’s deontological perspective would understand immoral service incidents as businesses violating universal moral duties, such as honesty and respect for human dignity, regardless of the consequences. In contrast, Mill’s utilitarian approach views such incidents as immoral only if they result in greater harm than happiness, meaning immoral service practices are wrong if they diminish overall well-being for customers, employees, or society. Both perspectives show how the “Murree incident” can be considered immoral behavior.

disregard for an ongoing opportunistic mismanagement amid the tourism boom prior to the tragedy. In the days following the incident, the movement expanded to critique deeper systemic issues related to tourism in the destination. Many users pointed out that the popularity of the destination had outpaced the local infrastructure's capacity to handle such large volumes of tourists (i.e., overtourism), underscoring long-standing problems with urban planning, emergency preparedness, and environmental sustainability. Calls for accountability turned into demands for policy changes aimed at regulating tourism and improving services in the area. Ultimately, the #BoycottMurree movement reflects a growing awareness and activism among citizens demanding greater accountability for a more sustainable and enjoyable tourism experience.

0.2.2 Triple Bottom Line

Building on the preceding discussion of the selected crises, the following section briefly introduces the Triple Bottom Line (TBL) framework, providing a structured lens to analyze their economic, environmental, and social implications of sustainability within the tourism and transport sectors. As one of the most relevant concepts of sustainability, TBL is a framework that broadened the focus of organizational performance beyond traditional financial metrics by incorporating environmental and social dimensions. TBL encourages organizations to pursue a more holistic strategy that balances profit-making with environmental stewardship and social responsibility, recognizing that these elements are interdependent components of long-term sustainability. Developed by John Elkington in the 1990s, the TBL therefore measures success in terms of three interconnected pillars: economic prosperity, environmental quality, and social equity (Alhaddi, 2015; Elkington, 1997; Elkington & Rowlands, 1999), often referred to as “profit, planet, people” (Alhaddi, 2015).

Environmental quality emphasizes the responsible stewardship of natural resources and minimizing adverse environmental impacts. It involves for instance adopting practices that reduce waste, energy consumption, and emissions, and promotes the use of renewable resources and sustainable supply chains. Organizations should hence consider their impact on ecosystems and biodiversity, striving to minimize harm and, where possible, restore and replenish natural systems (Alhaddi, 2015; Tyrrell et al., 2013).

Economic prosperity involves generating economic value through activities that not only ensure financial stability for the organization but also contribute positively to the broader economy and society. This includes creating jobs, stimulating local economies, and ensuring equitable distribution of wealth (Alhaddi, 2015; Elkington, 1997; Goel, 2010; Stoddard et al., 2012) as

well as supporting local suppliers, fair wages, employment of local residents or local taxes paid (Tyrrell et al., 2013). However, the economic aspect cannot be pursued at the expense of the environment or society.

Social equity, the third component, focuses on the well-being of individuals and communities affected by an organization's operations. This element advocates for instance for fair labor practices, community engagement, and respect for human rights. It requires organizations to consider the social implications of their activities and to work towards improving conditions for workers and local communities, ensuring that the benefits of economic activities are shared broadly and equitably (Alhaddi, 2015; Elkington, 1997; Goel, 2010; Stoddard et al., 2012). In the tourism industry, attributes in the social dimension may relate to community charity, health, safety, and security, or openness to public and local culture (Tyrrell et al., 2013).

The TBL collectively aims to encourage businesses and organizations to take a long-term view of success by balancing the needs of the economy, environment, and society (Hussain et al., 2016) and thereby provides a pragmatic framework for achieving sustainable development and fostering resilience in an ever-evolving global landscape (Stoddard et al., 2012). This dissertation is built on the framework of TBL, whereby each paper addresses issues connected to one or more dimensions of sustainability. Figure 1 offers an overview over the different dimensions addressed through paper P1 through P7.

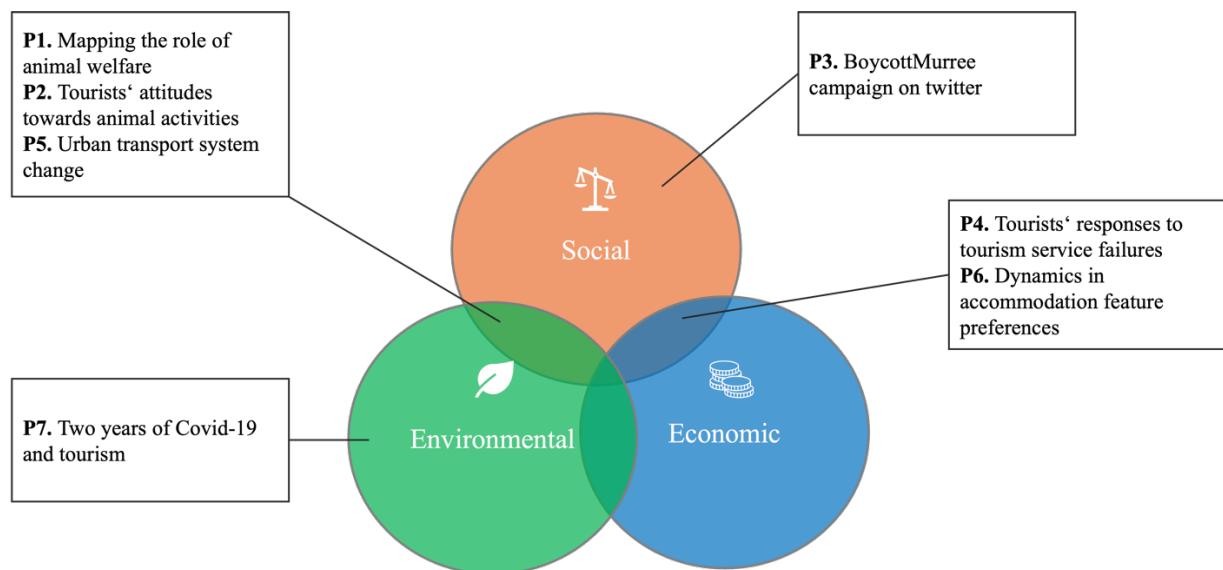


Figure 1. Integration of the articles based on the triple bottom line.

0.2.3 Actor-network perspective

Lastly, to interpret the broader context of the actor responses to the crises, Actor-Network perspective (ANT) theory is utilized as a theoretical framework. By definition, tourism is a collaborative endeavor that requires the active participation of multiple stakeholders to ensure functionality and competitiveness (Björk, 2000; Waligo et al., 2013). A multi-stakeholder approach is hence essential since the success of sustainable tourism relies on the collaborative efforts of all relevant stakeholders, defined as any groups or individuals who can influence, or are influenced by, the attainment of an organization's goals (Freeman, 2010; Roxas et al., 2020). ANT examines how various stakeholder entities influence and affect one another (Arnaboldi & Spiller, 2011; Vicsek et al., 2016) and provides an analytical framework for understanding the intricate web of relationships and interactions that define networks such as the tourism industry. Emerging from the fields of science and technology studies (van der Duim et al., 2013), ANT can be applied to explore ontological conditions (van der Duim et al., 2013), i.e., to assess diverse actors involved and the interrelationships between them. ANT was originally developed by Callon (1986) and Latour (2005) (especially influential in French and international contexts), and further distributed in the English language by Law (1992), to analyze the heterogeneous assemblages of human and non-human actors in shaping social realities. While classic ANT studies often involve detailed empirical tracing of networks and translation processes, scholars such as Law and Hassard (1999) and Mol (2002) have highlighted the theory's flexibility as a conceptual lens, allowing for both in-depth analyses and broader, meta-theoretical applications. In tourism research, ANT has been fruitfully applied to understand complex actor relations and controversies (van der Duim, 2007; Ren et al., 2017), supporting its use as an integrative framework for synthesizing diverse empirical findings.

Since ontology relates to the questions about what kinds of things exist, how these entities are categorized, and how they relate to one another (Epstein, 2016), it offers interesting insights into how sustainable tourism development is comprised (Dedeke, 2017). Therefore, ANT not only questions *what* sustainable tourism is, but also *how* it works and “*how it is assembled, enacted and ordered*” (van der Duim et al., 2013, p. 5).

Note. For full transparency it should be noted that ANT here is not applied as the primary analytical framework for the individual studies. Rather, it serves as an overarching, integrative reference framework for the synopsis. ANT enables the reflection on the diverse relationships and dynamics between actors in the contexts of the studied crises from a meta-perspective, and helps to place the findings of the individual studies into a coherent theoretical context. Employing ANT as a meta-perspective makes it possible

to systematically identify and connect the actors, relationships, and dynamics found in the individual studies. This approach facilitates a more comprehensive understanding of the interactions and reconfigurations within tourism and transport networks under crisis conditions, without necessitating a full, methodologically rigorous ANT analysis for each study. In contrast to classic ANT studies, which focus on detailed reconstructions of specific networks and translation processes, this dissertation draws on central ANT concepts, such as materiality, ordering, and multiplicity, to structure and interpret the results of the individual studies. Thus, ANT is applied at a conceptual level, enabling an integrative and comparative analysis across different crisis contexts. This approach does *not* constitute a full-fledged ANT analysis in the classical sense, which would require an in-depth, systematic tracing of actor-networks, translation processes, and material agency within specific empirical contexts. As such, the use of ANT here is primarily heuristic and illustrative, providing a lens for comparative synthesis rather than a detailed reconstruction of networks.

ANT reorients analysis from a traditional human-centric approach to a more inclusive framework that recognizes both human and non-human actors, such as policies, physical environments, and animals, as active participants in shaping tourism practices and experiences (Ren, 2011). This perspective enables a nuanced examination of how diverse stakeholders, including tourists, local communities, government entities, and market forces, negotiate their interests and co-create value within the tourism system (*ibid*), making ANT particularly effective for analyzing sustainable development (Dedeke, 2017; van der Duim et al., 2012). While its application as an analytical framework in tourism studies has grown, its application for sustainable tourism remains scarce (Buijtendijk et al., 2018); nonetheless, ANT has been proven suitable for the examination of sustainable tourism (Buijtendijk et al., 2018; Deason et al., 2022; Dedeke, 2017) and wildlife tourism in shaping tourist practices (Rodger et al., 2009). However, in absolute terms, studies applying ANT with regards to climate change remain rare (Deason et al., 2022; Rocheleau & Roth, 2007).

Notably, ANT should be seen as a translation device, i.e., an ‘architecture’ of concepts through which a story is constructed (Beard et al., 2016; Oppenheim, 2007), not as a theory to explain or predict behaviors (van der Duim et al., 2013). ANT should be applied for context-driven examples and cases to reveal the complexities and dynamics of a network, rather than for deducing theoretical generalizations (van der Duim et al., 2013). As such, it does not aim to focus on the single, definitive “order of things”, but rather elaborates on the diverse and multiple orderings through which the world emerges (van der Duim et al., 2013).

Unsurprisingly, ANT has been criticized over the years due to its radical reorientation, offering a radically symmetrical approach to analyzing socio-technical assemblages by conceptually equalizing human and non-human actors; while the symmetry principle promotes analytical openness and seeks to minimize anthropocentric bias, it has been critiqued for conflating essential differences between human agency and the functional roles of objects, technologies, or materials (Schulz-Schaeffer, 2000a). Proponents contend that ANT does not simply equate humans with non-humans; however, its analytical flattening may obscure important considerations such as intention, consciousness, and moral responsibility (Callon, 2006; Akrich & Latour, 2006). Furthermore, ANT has been critiqued to privilege micro-level processes and the relational dynamics within specific networks, often at the expense of addressing broader macrostructures, institutional contexts, or power relations (Peuker, 2010). This lack of structural perspective may limit its utility for analyzing systemic inequalities or institutionalized norms. Additionally, ANT explicitly distances itself from normative or political positioning, which poses challenges when addressing questions of social change, justice, or sustainability (Collins & Yearly, 1992; Shaping, 1995). Lastly, the call to trace and account for all relevant human and non-human entities equally can lead to highly complex, sometimes unwieldy empirical analyses, raising concerns about the practical feasibility and analytical focus of ANT-driven research (Kowald, 2008; Schulz-Schaeffer, 2000b). Acknowledging these shortcomings, ANT is applied for the synoptical theoretical lens due to its function of sensitizing researchers to the complex, relational, and material entanglements that shape social phenomena beyond human-centered explanations.

Central to ANT are three main principles: *ordering*, *materiality*, and *multiplicity* (van der Duim et al., 2012). *Ordering* refers to the ways in which social, economic, and technological systems are organized and structured. In tourism, ordering can involve the classification and arrangement of actors, practices, and resources that enable tourism activities to take place. Ordering reflects how various entities (“actors”, e.g., tourists, service providers, regulations, animals) are recognized, categorized, and positioned within the tourism network. Several key actors constitute the tourism sector, including authorities, tourism businesses, local communities, and tourists, each operating with distinct mental frameworks or agenda (Bramwell & Lane, 2000; Timur & Getz, 2009). Interactions among these stakeholders are evident and central, whereby they engage in interdependent relationships at various levels and power dynamics (Nguyen et al., 2019; Roxas et al., 2020). However, the boundaries of an actor-network are usually not static over time, but change frequently, as are the actors involved in the network (Nguyen et al., 2019).

Second, *materiality* emphasizes the significance of nonhuman elements in the network; an actor can be any agent, collective, or individual, who can associate with or dissociate from other agents (Dedeke, 2017; van der Duim, 2007; van der Duim et al., 2013). Actors are not merely passive backgrounds but actively shaping how tourism is experienced and understood. For example, the design of a hotel, the use of mobile applications, or natural landscape can profoundly affect tourist behavior and experiences and other actors through equity and reciprocity (Aka, 2019; van der Duim, 2007). By implication, society and nature cannot be separated (Aka, 2019). Ultimately, all the (non-)human actors are connected through interactions within the “tourismscape”³ (van der Duim, 2007), i.e., “actor-networks connecting, within and across different societies and regions, transport-systems, accommodation and facilities, resources, environments, technologies, and people and organizations” (van der Duim, 2007).

Third, *multiplicity* refers to the idea that there are multiple interpretations, perspectives, and versions of reality within a network. In the context of tourism, this means that different human actors (such as tourists, locals, business owners, and policymakers) may have varying and sometimes conflicting views and experiences of tourism practices and meanings (Van der Duim et al., 2017; van der Duim et al., 2013). Acknowledging this multiplicity opens up discussions about “ontological politics,” where the focus shifts to how different realities are constructed and negotiated within the context of tourism research (Dedeke, 2017).

To conclude, when tourism is put into practice, it is likely executed in various forms across different locations by diverse groups of actors with diverse perspectives (van der Duim et al., 2013). Instead of one single “tourism network”, numerous networks may exist, each representing multiple interpretations of tourism destinations or objects, which may initially appear to be uniform. ANT view is therefore adapted for the synopsis of this dissertation as it concentrates on the relationships between non-humans and humans, natural and social relationships (Rodger et al., 2009) in sustainable tourism.

Guided by the three elements of ANT, three research questions (RQs) can be deduced. These can be used to view the results of the individual studies through three overarching research questions:

³ The concept of *tourismscapes* encompasses individuals who utilize tourism services and the organizations that provide these services as well as hybrid environments (spaces shaped by natural and cultural objects, hotels, restaurants, entertainment facilities, etc.) and machines and technologies such as transportation networks (van der Duim et al., 2013).

RQ1) Who are the key actors in the selected tourism and transportation crises and how do they interact?

RQ2) How are these crises affecting industry players and consumer behavior as framed by the economic, environmental, and social dimensions of sustainability?

RQ3) What strategies do stakeholders use to mitigate negative impacts and promote resilience?

This dissertation employs an ANT approach to contextualize its individual studies and reveal the interconnectedness of diverse topics and actors, emphasizing their collective influence on the tourism network and the need for integrated responses. By framing tourism as an open network shaped by political, economic, environmental, and social factors, ANT enables a comprehensive analysis of these dynamic interactions, especially in times of crisis.

Central to this analysis are ANT's core concepts: materiality, which highlights that networks consist of both human and non-human actors, with crises serving as triggers for reorganizing these connections, aligning with RQ1's focus on identifying and connecting actors within tourism crises; ordering, referring to the processes of structuring and restructuring networks, particularly how crises disrupt and reshape tourism and transport systems through the lens of the Triple Bottom Line sustainability framework (RQ2); and multiplicity, which recognizes multiple, coexisting realities as actors experience and respond differently to crises, reflecting RQ3's exploration of varied actor responses, adaptations, or resistance. This integrated framework supports a nuanced understanding of how crises influence the evolving structure and function of tourism networks.

With problems of high complexity, scholars have recommended a mix of qualitative and quantitative research (Cristiano & Gonella, 2020; Jere Lazanski et al., 2006). Methodologically, this dissertation therefore employs a mixed method to produce answers to the overarching research questions. The individual studies employ a selection of both quantitative (i.e., surveys, implicit association test, structural equation modeling, factor analysis, text mining, time series analysis, topic modeling, sentiment analysis) and qualitative research (i.e., content analysis, discourse analysis, framing analysis) methods.

1 P1. Mapping the Role of Animal Welfare in Tourism: Examining Discourses in Tourism Research and Beyond Using a Bibliometric Co-Occurrence Analysis of Author Keywords

Author:

Nadja Schweiggart

Abstract

Animals are extensively used in the tourism industry to provide pleasurable tourist experiences, for instance in zoos, as working animals or in the wild. However, ample evidence shows that animals often suffer in these conditions, both physiologically and psychologically. Despite the growing popularity of animal-based tourism, some scholars caution that animal welfare receives insufficient attention from tourism research. Therefore, this study condenses knowledge on tourism and animal welfare from various research fields, e.g. social, veterinary, and environmental sciences, by conducting a bibliometric co-occurrence analysis on author keywords of 405 publications on articles (1994 to 2023). Findings indicate that animal welfare in the tourism scope is an interdisciplinary research topic, which has received limited attention from the tourism field. While research output has increased notably since 2020, discussions on tourism externalities impacting animal welfare are still led largely outside of tourism academia. Four main research streams are identified: (1) Wildlife conservation: benefits and challenges, (2) Anthropogenic impact and animal behavioral responses, (3) Visitor perspectives: Motivations, satisfaction, and human impacts, (4) Working animals: Fatalities and mortality. As the first systematic literature analysis on the subject, this study is cross-disciplinary and provides a valuable overview of the research object.

Keywords: Bibliometrics, literature analysis, animal welfare, animal ethics, co-occurrence analysis

Citation:

Schweiggart, N. (2024). Mapping the role of animal welfare in tourism: examining discourses in tourism research and beyond using a bibliometric co-occurrence analysis of author keywords. *Journal of Ecotourism*, 23(4), 740-767.

1.1 Introduction

Tourism presents unique opportunities for close interactions with wild animals, such as petting, riding, or swimming (Hoarau-Heemstra & Kline, 2022; Winter, 2020), especially with species that are very different to those most people come across in their daily lives (Winter, 2020). Driven by increasing urbanization (Carr & Broom, 2018), animal-based tourism has become a multibillion-dollar industry (Essen et al., 2020). Zoos and aquariums globally attract more than 700 million visitors annually (World Association of Zoos and Aquariums, 2015). In economic terms, wildlife tourism alone contributes 20 to 40 per cent of international tourism (Filion et al., 1994; Moorhouse et al., 2017). While tourists increasingly seek more intense experiences (Cohen, 2019), animals often pay a heavy price (Cohen & Fennell, 2016; Essen et al., 2020). Earlier estimates suggested that approximately 2.6 million animals were held captive in 800 zoos and aquariums globally (Fennell, 2013a), many of them originally taken from the wild (Campos-Arceiz, 2016).

However, research has provided ample evidence that human-animal interaction can negatively affect animals' psychological and physiological well-being (Moorhouse et al., 2015; Schmidt-Burbach et al., 2015), e.g., obesity, stereotypic behaviors, or shorter life spans (Clubb et al., 2008; Elzanowski & Sergiel, 2006). Despite clear evidence on how animals are adversely affected, the consideration of animal welfare in the tourism literature remains limited. Only few tourism scholars have challenged the animal use and urged, for example, 'that animal ethics is further developed as a specialized field within broader tourism ethics' (Winter, 2020). Against this background, this paper aims to advance the animal welfare discussion within the tourism field by conducting the first systematic literature review.

Various terminologies exist in the realm of caring for animals; animal welfare refers to the well-being of animals and their human treatment, while animal agency refers to animals' freedom and autonomy (Edelblutte et al., 2023). Similarly, animal advocacy involves the active support and promotion of animal welfare and rights (i.e., legal protections) (Peggs, 2013). Lastly, animal ethics involves the philosophical study of moral principles and values concerning human interactions with animals (Winter, 2020). While these concepts are interconnected, this study acknowledges that they have distinct foci. This study encompasses an investigation of the consideration of all these different dimensions of animal care (yet, for simplification purposes hereafter called 'animal welfare').

By quantifying and mapping scientific discussions, the study connects discourses led in different research fields, such as tourism, veterinary studies, and conservation sciences. It is the

understanding of the author that the question of moral and ethical consideration of using animals in the tourism sphere can only be answered if scholars aggregate existing knowledge before interpreting these against the background of their respective fields. Therefore, this study provides an extensive overview over existing challenges, discourses and perspectives, and identifies research gaps to spark further discussions.

This study applies both qualitative and quantitative methods. For the latter, a bibliometric analysis produces applied descriptive frequency analysis, co-occurrence and factor analyses to examine the pertinent literature using author and journal keywords, which are crucial metadata for analyzing scientific knowledge structures (Lu et al., 2020). This method facilitated the extraction and analysis of 405 papers published across 182 journals spanning 28 years (1994–2023).

1.2 Materials and methods

1.2.1 Literature review: animal welfare research in the tourism scope

The modern tourism industry has intensified and facilitated access to wild animals for tourist experiences (Winter, 2020). Despite substantial research in other fields (Fennell, 2012a, 2012b; Shani & Pizam, 2010), research in the social sciences is still in its infancy. Von Essen et al. (2020, p. 2) state that the ‘literature problematizing animal predicament is new and lacking’, and Fennell (2008, p. 223) describes tourism’s approach to animal ethics as ‘isolationist’, and associated research as ‘terra incognita’ (Fennell, 2014, p. 983).

Only a few literature reviews have been published on animal welfare in tourism. Winter (2020) conducts a discourse-ethics review on animal ethics in tourism, reporting that of the ‘many papers on animals and ethics [...], relatively few relate to tourism’ (p.2) and concluding that tourism scholars should challenge the use of animals for entertainment. Other reviews have been conducted, e.g. by Fennell (2013b), Von Essen et al. (2020) or Bansiddhi et al. (2020), yet with different foci. Similarly, few bibliometric analyses exist in the field of animal welfare research, yet with other foci, e.g. Phillips and Molento (2020) (animal welfare centers), Sinclair et al. (2020) (farm animals), Freire and Nicol (2019) (animal science research), Yatcilla (2021) (human-animal interactions), or Rousseau and Binet (2022) (single journal). Evidently, the role of animal welfare in tourism remains unclear. As tourism scholars acknowledge, ‘the context within which this animal use exists, is the diverse, global tourism industry that is virtually impossible to regulate and control’ (Moorhouse et al., 2017). Outside of tourism research,

scholars in other fields have built a vast body of knowledge on the effects of tourism on animal welfare (Fennell, 2012a, 2012b; Shani & Pizam, 2010).

1.2.2 Study methods

Bibliometrics is a research field in information sciences which analyzes bibliographic data using quantitative methods (Broadus, 1987). Specifically, this study applies a bibliometric co-occurrence analysis of publication keywords. Author keywords are topic-specific words chosen by the study author(s) to describe the article's thematic content and to direct attention to the article (Lu et al., 2020; Uddin & Khan, 2016). As Zhang et al. (2016) show, Web of Science's 'keywords plus' (i.e., additionally added by the journal) are as effective as author keywords for conducting bibliometric analyses.

As such, bibliometric methods assume that authors and scientific databases choose keywords sufficiently well to link the topics in their articles. A co-occurrence of keywords indicates a connection between topics (Cambrosio et al., 1993). Many co-occurrences appearing around the same keyword(s) hint at a potential overarching research theme across the articles (Ding et al., 2001).

A multitude of bibliometric studies have been performed using, e.g. the VOSviewer software (Ye, 2018) or the R-package 'Biblioshiny' (Singh & Bashar, 2023). Such studies allow for a quick check of publication data, while a manual analysis is suitable for a thorough analytic process, preprocessing possibilities, and a manual quality check (e.g., Kuntner & Teichert, 2016). The bibliometric approach used in this study involves the following steps: (1) data sample retrieval through identification of suitable scientific articles in a literature database, (2) co-occurrence analysis and factor analysis, and (3) manual qualitative analysis from a meta-perspective using a content-analysis approach to verify and determine the main stories of the articles and research streams identified by the quantitative methods (Figure 2).

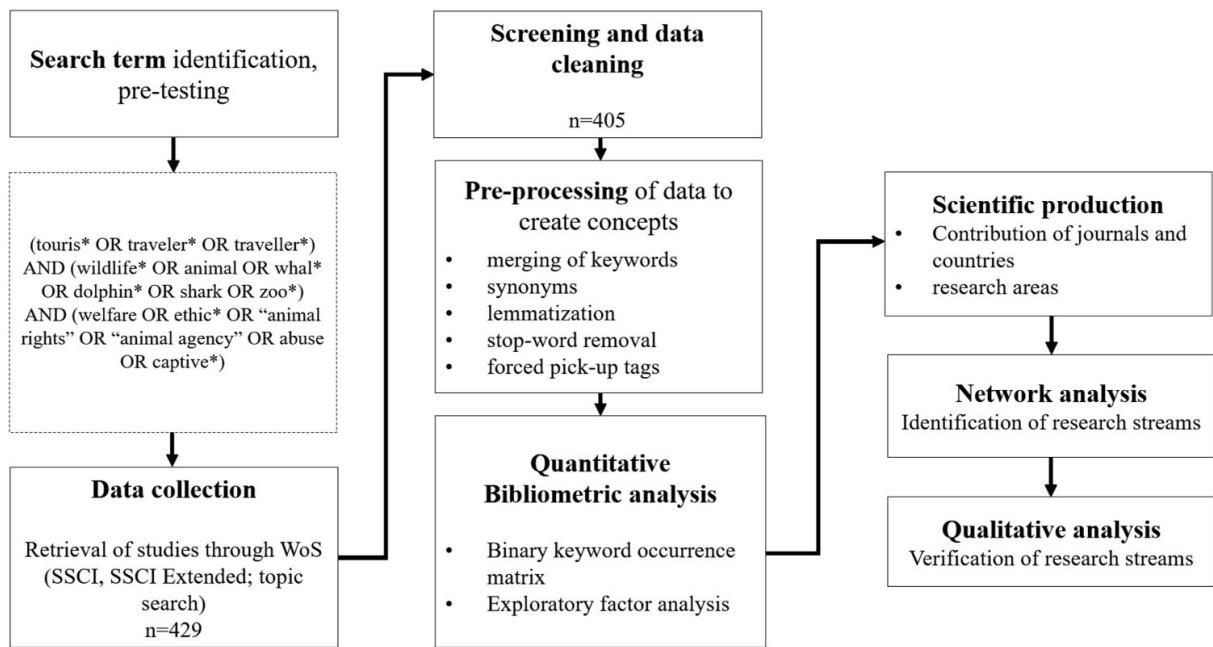


Figure 2. Analysis process. Own illustration.

1.2.3 Data collection

Data is collected from the Web of Science (WoS), specifically, the Social Science Citation Index (SSCI) (most frequently used database in social sciences; see Ramos-Rodríguez & Ruíz-Navarro, 2004; Zupic & Čater, 2015), as well as the SSCI Extended database due to the relatively unexplored and multidisciplinary nature of the research field. To this aim, a suitable search term was developed by adopting an iterative process involving search term definition to identify publications that represent the predominant body of literature on animal welfare and tourism. According to proven practice in bibliometrics (e.g., Kuntner & Teichert, 2016), a sample of initial articles provided synonyms and related terms. Only words which added additional and relevant articles remained in the final search term. Thus, multiple combinations of keywords were applied, and one single search term was developed, which proved to be both exclusive enough to exclude non-relevant results, as well as inclusive enough to retain the most relevant papers identified manually.

As illustrated in Figure 3, relevant publications satisfied references to the three dimensions of (1) tourism, (2) animals, and (3) dimensions of welfare (see differentiation in introduction). Further, synonyms for each concept were identified and connected via Boolean operators. Lastly, the search term was streamlined based on the most suitable literature result. While discussions on animal welfare in tourism relate to a variety of animal species, including them in the keywords did not yield any additional results in articles, except for 'whale,' 'shark,' and

‘dolphin’. To ensure a streamlined search term, only these three species were included, which, however, does not mean prioritizing or excluding specific types of animals.

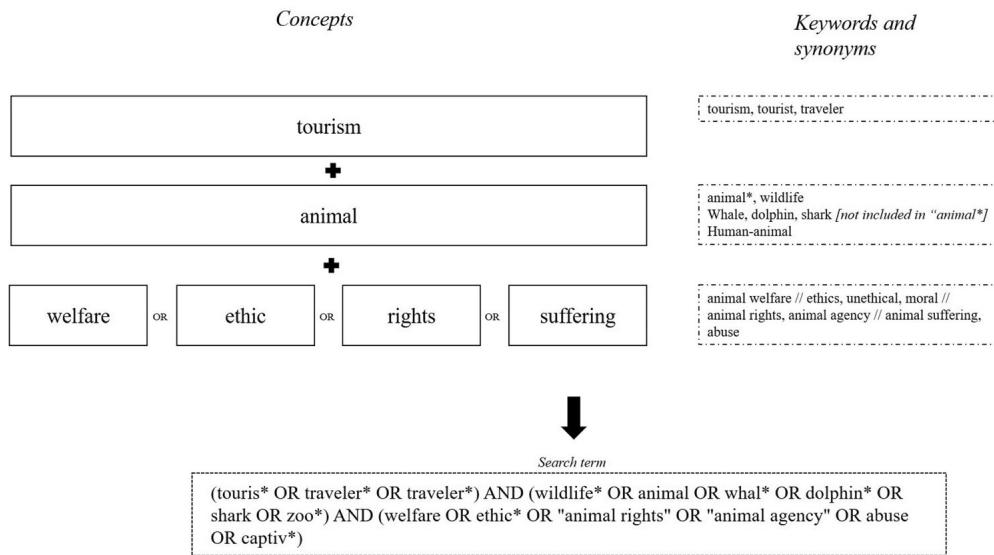


Figure 3. Concepts and keywords used in the search term. Own illustration.

The search term was applied in the WoS topic search (TS), which included title, abstract, as well as keyword search, in the WoS Core Collection. No start or end point for paper publication was selected, and articles until April 2023 were collected, resulting in the retrieval of 429 peer-reviewed articles. Subsequently, the database was scanned manually by the author for thematic fit and eligibility. Articles falling outside the scope of the intersection between animal welfare and tourism were deleted from the sample (see Agapito, 2020), yielding 405 articles that were fit for further analysis ('final sample').

1.2.4 Pre-processing

While the metadata of an article provides various information, this study's main objective is to analyze publications for keyword co-occurrence. Keywords chosen by the author(s) ('author keywords') and indexed terms that are generated from the title of articles ('keyword plus') were merged to gain a complete set of units of analysis.

Next, a list of synonyms was created from the sample using the software KH Coder and Microsoft Excel. Based on KH Coder's word frequency analysis, words with the same or similar meanings were summarized as one single concept. Considering synonyms is highly relevant in accounting for the fact that authors often use different keywords or abbreviations to describe the same or similar research topic(s) (e.g. 'human-animal encounter,' 'animal-human encounter'), which, if untreated, would falsely appear as two different concepts. Each concept, therefore, summarizes synonyms or similar keywords for the same underlying construct.

Further, by instruction, frequently occurring or common composite words (e.g., ‘Africa elephant,’ ‘willingness-to-pay’) were kept together in the analysis (‘forced pick-up tags’).

To include only the most representative concepts in the analysis and to exclude random outliers from single publications, only concepts mentioned more than five times were kept in the analysis (‘cut-off value’, $n = 5$) (So et al., 2023). Further, the author manually eliminated single stop words in the preprocessing step, considering these words as irrelevant because they were included in the search term and could yield trivial results (e.g., ‘animal’, ‘welfare’) (see Block & Fisch, 2020). Following these steps, 128 keywords representing 39 per cent of all mentions were included in the final sample for further analysis (Appendix I).

1.2.5 Analysis

A binary keyword occurrence matrix was created using the software KH Coder, providing an overview of the occurrence of the article sample's concepts. The matrix is dichotomized such that a set of two keywords receives the value one if the keywords were connected, and zero if not connected (Wörfel, 2021). This matrix was then further analyzed for frequency with the software UCINET version 6.636 (Borgatti et al., 2002), creating a keyword co-occurrence matrix which displayed the number of co-occurrences of each concept.

In line with previous research, an exploratory factor analysis was conducted using IBM SPSS Statistics 28. Factor analysis is a technique commonly used to identify research streams within a scientific field (McCain, 1990) to reduce dimensionality and create meaningful subgroups (Kuntner & Teichert, 2016). The co-occurrence frequency provided a basis for grouping concepts into factors, thereby identifying keyword concepts which represent a shared research stream. Principal component analysis and a Varimax rotation with Kaiser normalization were used to extract the research streams. For better results, extremely small factor loadings (<0.4) were suppressed in the factor analysis. The factor loadings of the factor analysis display representativeness of keywords for a given research stream (Wörfel, 2021). A manual quality check on the concepts was performed, grouping them into one concept based on their co-occurrences.

As a common approach in bibliometrics, complementary social network analysis was applied to visualize the research network's structure (McCain, 1990). The software UCINET (Borgatti et al., 2002) and Gephi (version 0.10.1) (Bastian et al., 2009) were used to visualize positions intellectually similar articles, i.e. ones with frequently co-used keywords, closer together according to their geodesic distance. A map of science is therefore a spatial representation of how entities are related to one another as indicated by their physical proximity and relative

location (Small, 1999). Finally, a simple frequency analysis using Microsoft Excel was conducted to analyze the publications' distribution based on year of publication, research area, journal, and author affiliation by country.

1.3 Results

1.3.1 Scientific production

1.3.1.1 Yearly distribution of publications

The first publication on animal welfare and tourism was published in 1994. As Figure 4 shows, scientific discourse in the domain of animal welfare and tourism received almost no scholarly attention during the 1990s and very little consideration in the early 2000s. Only since 2015 do we find attention noticeably growing, with a significant increase as of 2019 ($n>40$ publications per year) and a peak in 2020.

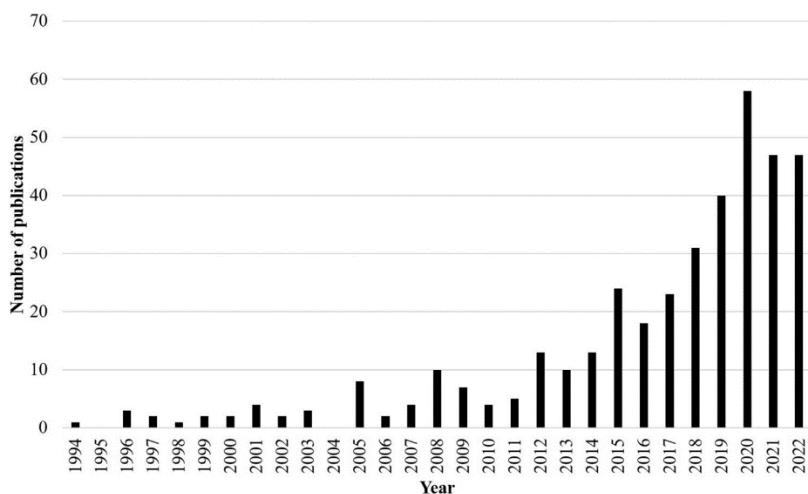


Figure 4. Scientific annual output (peer-reviewed journal articles only). Own illustration.

1.3.1.2 Most relevant journals

The most relevant journals (measured by number of published articles) for the period between 1994 and 2022 were analyzed, which amounted to publications in a total of 182 journals. As Figure 5 shows, the five journals that published the most articles are *Animals* ($n=33$; 18 per cent of total publications), *Journal of Sustainable Tourism* ($n=26$; 14 per cent of total publications), *PLoS One* ($n=16$; 9 per cent of total publications), *Tourism Management* ($n=15$; 8 per cent of total publications), and *Annals of Tourism Research* ($n=12$; 7 per cent of total publications).

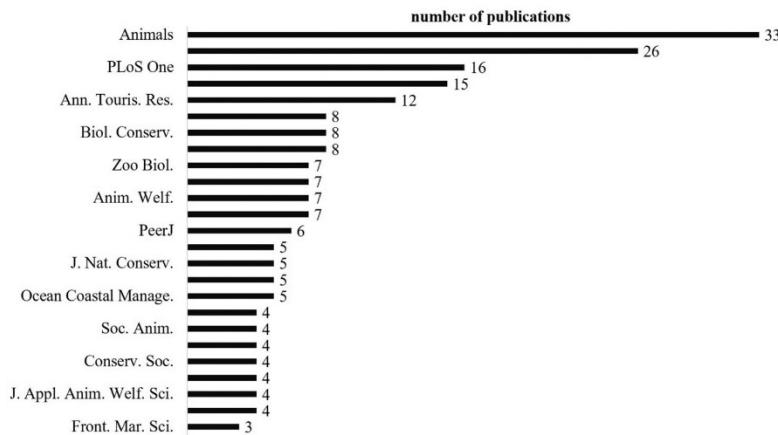


Figure 5. The 25 most relevant journals (by publication numbers). Own illustration. Note: For better visualization, journals with less than three publications in the sample are not included.

In business and tourism management, the *Journal of Sustainable Tourism* (n = 26), *Tourism Management* (n = 15), *Annals of Tourism Research* (n = 12), as well as *Current Issues in Tourism* (n = 8) and *Tourism Review* (n = 4) are the most relevant publishing outlets. The leading position of *J. Sustain. T.* is not surprising due to its inherent aims and scope. Further, special issues and curated collections have been published by *J. Sustain. T.* (Vol. 31, 2023), *Ann. Tour. Res.* (Winter, 2020) and *Curr. Issues Tour.* (Carr, 2009).

Most other articles were published in the journals *Animals* (n = 33), *Biological Conservation* (Biol. Conserv.; n = 8), *Global Ecology and Conservation* (Glob. Ecol. Conserv.; n = 8), *Zoo Biology* (Zoo Biol.; n = 7), *Anthrozoös* (n = 7), and *Sustainability* (n = 7). These journals, according to their aims and scope, mainly publish studies in zoology and veterinary sciences, as well as conservation sciences. Lastly, several zoology journals such as *Soc. Anim.*, *Wildl. Res.*, *J. Appl. Anim. Welf. Sci.*, and *Appl. Anim. Behav. Sci.* are specifically devoted to animal welfare, where studies are mostly outside the scope of explicit tourism or business research.

1.3.1.3 Author affiliation countries

As is customary in bibliometric research (Martínez-López et al., 2020), the region of research output is of interest. The countries of author affiliations were analyzed based on the author addresses of all authors listed in a publication. Figure 6 and Appendix IV represent the main affiliation countries as the United States of America (16%), Australia (12%), England (8%), Thailand (7%), and the People's Republic of China (6%). These five countries publish almost 50 per cent of all publications in the field of animal welfare and tourism.

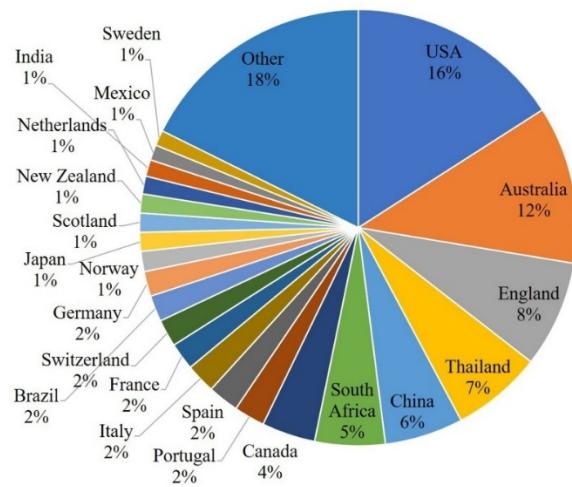


Figure 6. Author affiliation countries (all authors per publication). Own illustration.

1.3.1.4 Research fields

The publications are examined according to their area of research as indicated in the WoS database. Since a single publication can be categorized in more than one research area, multiple categorizations are possible. As depicted in Figure 7, animal welfare studies are highly multidisciplinary. The most productive research areas are Environmental Sciences and Ecology (18%), Social Sciences – Other Topics (12%), Veterinary Sciences (11%), and Zoology (11%), which cumulatively constitute more than 50 per cent of the publications (Appendix V).

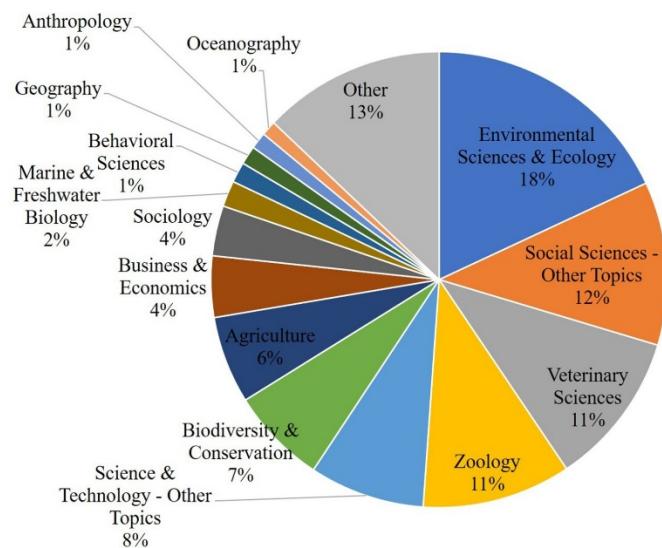


Figure 7. Research areas of publications. Own illustration.

A manual analysis of the sample reveals that articles published in tourism-oriented journals are mainly listed in the category Social Sciences – other topics (e.g. Fennell & Thomsen, 2021; Moorhouse et al., 2019), with smaller fractions in Sociology (e.g. Aijala, 2021; Winter, 2020),

Business & Economics (e.g. Farreras & Riera, 2013; Mkono, 2018), Science & Technology – Other Topics (e.g. Holmes et al., 2016; Suarez-Rojas et al., 2022), and Environmental Sciences & Ecology (e.g. Smith et al., 2008).

1.3.2 Research streams in animal welfare and tourism

Subsequently, a factor analysis on the co-occurrence of concepts unveils their use contexts and maps their discourses (Kuntner & Teichert, 2016). The analysis extracted four components (i.e. topics), which explain 57.03 per cent of the total variance in the dataset (Appendix II), thereby yielding a model with satisfactory explanatory power.

A rotated component matrix (Appendix III) provides an overview of these topics derived from frequently co-occurring keywords and their respective factor loadings. According to the co-occurrence of keywords, the analysis groups concepts those concepts into topics, sorted by factor loading, representing single research streams. Based on these topics, the author qualitatively analyzed articles to determine each stream's key attributes. Articles with a high number of keywords allocated to an attributed factor served as references to describe the stream's research paradigm.

A qualitative content examination of the keywords assigned to the articles in the sample produced summarizing descriptions for the various research streams (Appendix IV): (1) Wildlife conservation: benefits and challenges, (2) Anthropogenic impact and animal behavioral responses, (3) Visitor perspectives: motivations, satisfaction, and human impacts, and (4) Working animals: fatalities and mortality. Figure 8 provides a graphical overview of concepts' research streams and spatial interconnections, whereby the size of the nodes and labels reflects the total number of occurrences, the thickness of the lines reflects co-occurrences of two concepts, and the color indicates factor affiliation.

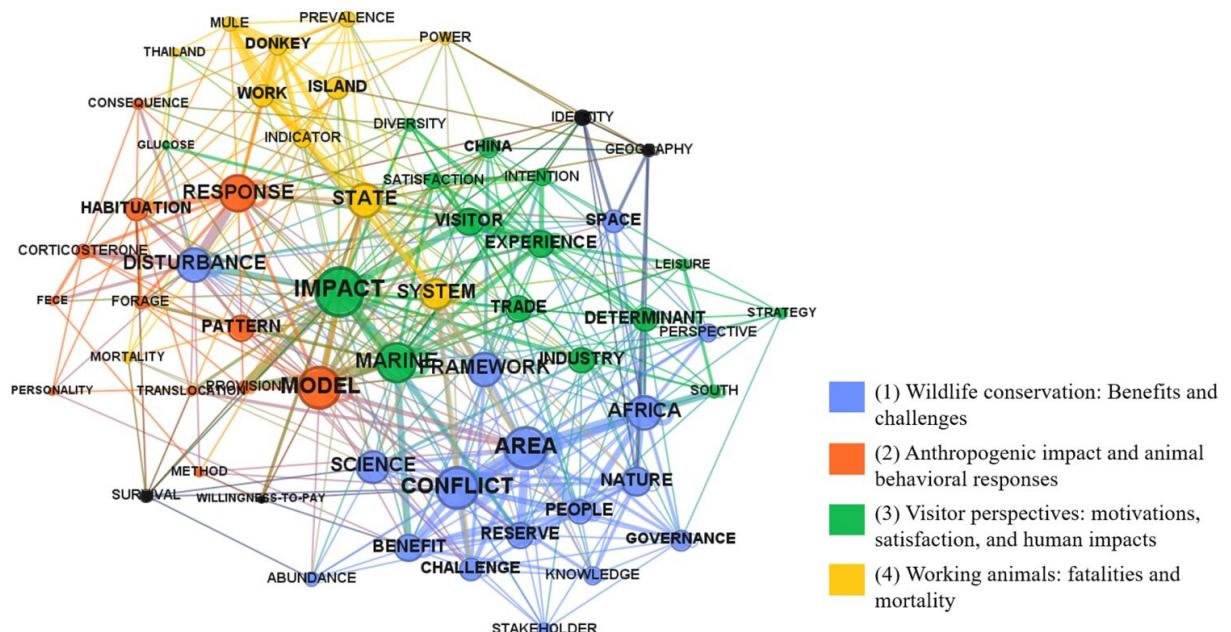


Figure 8. Research streams. Own illustration/Gephi.

For an ex-post examination of the accuracy of the quantitative results, similar to any literature review, the author manually examines the abstracts containing the concepts with a critical content-analysis approach. First, all article abstracts were reviewed. Since articles can contain factor words related to more than one research stream, one article can be allocated to multiple collections, explaining why the cumulated number of articles per research stream exceeds the total sample size (see Appendix IV). Second, the author reviewed in more detail the articles with especially high keyword occurrences in a specific factor to determine the objective accuracy of factors suggested by quantitative methods. In doing so, the quantitatively derived factors could be verified by this qualitative approach.

Following here, the research streams are described and interpreted regarding the various concepts' appearance in the article sample. Keywords included in the respective topic are depicted in italics.

1.3.2.1 Research stream 1: Wildlife conservation: benefits and challenges

The first research stream covers discourses on the conservation of wildlife, nature, and reserves, as well as the related benefits, challenges, and governance approaches. The largest of the four research streams contains 295 articles. The research stream focuses on diverse viewpoints regarding wildlife conservation benefits, including animal protection, human and public interest, local perspectives, and economic advantages, as indicated by the concept of area, e.g. in 'conservation area' or 'protected area' (Shahi et al., 2023).

One perspective advances the benefits of wildlife conservation for different actors, i.e. for the sake of animal protection, e.g. Moorhouse et al. (2015) and Notaro and Grilli (2022), or (2) benefits for humans, both for the general public as well as locals participating in the tourism industry (Fischer et al., 2011). For the latter, examples include studies on the benefits of trophy hunting and photo-tourism for economy and wildlife conservation (Fischer et al., 2011; Mbaiwa & Hambira, 2023; Zimmerhackel et al., 2018).

Therefore, different perspectives are presented regarding wildlife conservation aims, such as considering humans' connectedness to nature (Yerbury & Weiler, 2020), or animal ethics (Winter, 2020), from various stakeholders' viewpoints, e.g. animal caregivers (Hayward et al., 2022; Zhang et al., 2022), tourists (Notaro & Grilli, 2022), and residents (Shahi et al., 2023). Also, specific geographical perspectives are given (Mkono, 2019). Stakeholders play a crucial role in wildlife conservation (Connolly & Cullen, 2018; Rastogi et al., 2014).

Similarly, the concept 'people' occurs regarding unethical behavior of tourists (Tickle & von Essen, 2020) and their satisfaction with animal experiences (Karanikola et al., 2020) as well as locals' influence (Damanis & Scandizzo, 2017). Challenges and conflicts occur in conservation management (Das & Chatterjee, 2020). These issues are linked to the concept of space, often explored in the context of tourists' spatio-temporal behavior in zoos (Xu et al., 2020).

Insufficient wildlife conservation efforts result in declining wildlife abundance, including fluctuation in animal numbers, species distribution, or reduction of species population. Animal abundance is viewed from at least two different angles, i.e. being impacted by tourist demand (Croft & Witte, 2021) or as a prerequisite for offering tourism activities (Zimmerhackel et al., 2018).

In a quest for tension reduction, scholars discuss the role of governance, including global regulation of animal welfare in the tourism industry (Duffy & Moore, 2011; Jamal, 2020). Sheppard and Fennell (2019) analyze tourism policies from 73 countries regarding non-human animal involvement. Other scholars study the impact of taxes on tourism activities for wildlife management areas (e.g. Sulle & Banka, 2017).

1.3.2.2 Research stream 2: Anthropogenic impact and behavioral responses in animals

The second research stream discusses in greater detail the human impact on animals' well-being. It becomes apparent in the discussion of disturbance of their natural behaviors and the resulting behavior changes. One or more of the concepts included in the topic occur in 123 articles. Examples include disturbances by tourism activities, such as winter recreation (Marion

et al., 2020), tour boats (Martin-Montalvo et al., 2021), wildlife viewing (Szott et al., 2019), or noise (Wolf & Croft, 2010).

Further, the concept of provisioning (the collection and delivery of food) is central in this research stream, especially as uncontrolled provisioning by tourists happens or the provisioning of wildlife is applied to increase the likelihood of tourist-animal interaction (Carrera et al., 2008; Senigaglia et al., 2022). These practices are evaluated both as beneficial for tourism as well as negatively impacting animal behaviors (Ziegler et al., 2018).

Anthropogenic disturbances may lead to consequences in animals' behavioral such as psychological responses or changes in movement patterns (Marion et al., 2020; Martin-Montalvo et al., 2021; Szott et al., 2020). Corticosterone metabolite levels, measured through fecal analysis, are used to assess stress responses (Walker et al., 2005). Discussions encompass animals in captivity, in natural habits (Martin-Montalvo et al., 2021), and working animals (Burn et al., 2008). Other publications also discuss consumer responses and management strategies (Allbrook & Quinn, 2020).

The concept of personality is either discussed for animal personalities in human-animal interaction and their adaption to human presence (e.g. Rossman et al., 2017), or for human pro-welfare personality types (e.g. Guachalla, 2022). For animals' behavioral adaption to humans, the concept of habituation is debated, shown by reduced antipredator responses (Geffroy et al., 2020). Examples include sharks' responses to attractants used in shark-diving activities (Heinrich et al., 2022), horseback safari rides (Hodgson et al., 2022), and orphaned animals following poaching incidents (Fabregas et al., 2020).

Behavioral changes in animals can result in pattern modification, such as responses in animals' behavioral, movement (Xu et al., 2020), or residency patterns (Hammerschlag et al., 2012). The term 'pattern' is also used in contexts measuring collision rates related to road infrastructure (Cunneyworth & Duke, 2020) and human marine conservation patterns (Gallagher & Huveneers, 2018). Similarly, translocation discusses animals moving away from their natural habitat due to tourist pressure, increased stress, or traumatic experiences (Fabregas et al., Szott et al., 2019; Szott et al., 2020) as well as endangered endemic wildlife intentionally being translocated to fenced and protected reserves (Burke et al., 2008).

1.3.2.3 Research stream 3: visitor perspectives: motivations, satisfaction with visiting experiences, and human impact

The third research stream, containing 196 articles, reflects on visitor experiences of human-animal encounters and issues in the leisure industry.

The keyword experience is central to this topic, often connected with the tourist experience or visitor experience. Discussions indicate a tension field between animal welfare efforts and tourist satisfaction aims, e.g. experience satisfaction in agritourism (e.g. Jeczmyk et al., 2021) or eco-sanctuaries (Zhang et al., 2022). From an animal-welfare perspective, Danby and Grajfoner (2022) critically examine human-equine touristic experiences, Wilson and Phillips (2021) criticize lion cub petting, and Tay et al. (2023) analyze signage's potential on promoting non-harmful visitor behavior. Scholarly discussions include critical perspectives on animal experiences (Kang & Lee, 2016), perceptions across tourist generations (Gao et al., 2018), and the visitors' motivation, concern, and animal rights perception (Suarez-Rojas et al., 2023).

Customer satisfaction is therefore prominent in the research stream, being explored for zoo visits, camel riding (Pastrana et al., 2020), or wildlife tourism (Pastrana et al., 2020; Prakash et al., 2019). Closely connected to this aspect are the concepts of intention and determinant, referring to tourists' (re)visit and behavioral intentions (Minton et al., 2020; Prakash et al., 2019).

Consequently, impact refers to discussions about human impacts (Giglio et al., 2022; van der Merwe et al., 2021), being closely related to the second research stream, or about environmental or economic impacts. Glucose serves as a measurement element for stress responses in the veterinary sciences (Norkaew et al., 2019). Trade refers to wildlife trading, sometimes as illegal trade (Macdonald et al., 2021).

Finally, the concept industry appears widely in the tourism industry or, more specifically, the private wildlife industry, discussing the industry's characteristics (Dilek & Fennell, 2018) and responsibilities (Font et al., 2019).

1.3.2.4 Research stream 4: working animals: fatalities and mortality

The fourth research stream considers animal welfare for working animals in the tourism industry and their severe consequences. This research stream is represented in 110 articles. Dominant keywords are donkey and work, i.e. working equids and their welfare, e.g. in wildlife safaris (Hodgson et al., 2022), in developing economies (Pinsky et al., 2019; Sommerville et al., 2018), tourism carriages (Burn et al., 2008; Vergara & Tadich, 2015), and donkey riding (Ali et al., 2016). It can also be found in work-for-care approaches, where animals generate income for animal-interaction venues designed to support the animals' care (Cui & Xu, 2019).

Consequences are discussed, e.g. in regard to illnesses. Researchers measure the prevalence of animal conditions resulting from their forced work for tourism activities, e.g. stereotypic behavior (Rowland et al., 2022), infections (Menn et al., 2010), or dehydration (Pinsky et al.,

2019). Other consequences relate to the concept of mortality, e.g. mortality rates in captivity (LaFleur et al., 2019), road mortality (Cunneyworth & Duke, 2020), from illegal wildlife trade (Prakash et al., 2020) or trophy hunting (Macdonald et al., 2017). Consequences are often measured by stress indicators (de Mori et al., 2019; Szott et al., 2019; Szott et al., 2020). Similarly, the concept of state refers to emotional, affective, or physiological states in animals or travelers' stated preferences.

Consequently, the concept of power features in discussions about power dynamics in improving animal welfare and social sustainability. Scholars specifically debate the legitimacy of animal captivity (Scollen & Mason, 2020), the education of tourists (Moorhouse et al., 2022), the empowerment of local communities in wildlife conservation (Sulle & Banka, 2017), and governance power (Duffy & Moore, 2011). System involves systematic tools and approaches to welfare evaluation (Sommerville et al., 2018).

1.4 Discussion

1.4.1 Reflection on main results

The study results confirm that animal welfare is a relatively young research topic in the social and economic sciences. Before 2012, fewer than ten scientific studies were published annually. The investigation of animal welfare in tourism long remained a niche topic accelerated by pioneering scholars like D. Fennell, E. Cohen, and T. Moorhouse. The surge in research since 2020 coincides with the beginning of the Covid-19 pandemic, which highlights the complex relationship between ecosystems, animals, and human intervention (Jiang et al., 2022). While few publications on Covid and animal welfare in the sample were already published in the first year of Covid (e.g. Hurn et al., 2020; Vidaurreta et al., 2020), many more followed in the subsequent years. Scholars such as Sumanapala and Wolf (2022) advocate for the rethinking wildlife tourism and conservation in a post-pandemic world. The interdependence of tourism and wildlife became evident, particularly when animal welfare depends on tourism income: Lockdowns led to reduced human provisioning (Seguigne et al., 2022), halted conservation efforts due to suspended ecotourism (van der Merwe et al., 2021), and financial strain on animal caregivers resulting in food shortages (Supanta et al., 2022). Scholars caution that without measures limiting interaction between wildlife and humans, we risk the emergence of more virulent coronaviruses (Perveen et al., 2021), underlining the heightened responsibility to the tourism industry.

The highest research output of North American, Australian, and European institutions exemplifies cultural and socialization influences and a need to consider that a Western-dominated perspective in research may introduce a cultural bias. The diversity of publishing journals highlights the multidisciplinarity in studies considering animal welfare.

The most frequent research areas are environmental sciences and ecology, social sciences, veterinary sciences, and zoology (11%). Animal welfare is therefore inherently interdisciplinary. These findings are in line with Yatcilla (2021) who highlights the collaborative nature of human-animal interaction research. At first glance, given the need for primary research in close contact with animals, this distribution is not surprising. However, one could question the small share of the social sciences in animal welfare research and the associated tourism scholarship's awareness and responsibility for animal welfare.

These findings correspond with the findings of earlier scholars who criticize the limited attention tourism research has afforded to animal welfare (Fennell, 2012a, 2012b; Shani & Pizam, 2010; Winter, 2020). The effects of tourism on animal welfare are predominantly discussed outside the tourism research field, while the tourism industry itself, as the originator of the identified effects, fails to deal with its own externalities. As Kajikawa et al. (2007) claim, tourism is a prominent research area within sustainability, yet there are controversial discussions regarding its management of oceans and wildlife. From a content perspective, the overarching discussion of conflicts between tourism and animal welfare hints towards an area of tension, which is yet to be resolved. Network analysis shows that the tourism cluster frequently intersects with discussions in ecological economics, indicating the strong interconnection between the tourism cluster and economic aspects (Kajikawa et al., 2007).

Lastly, the factor analysis reveals that the discourse on animal welfare is fed by four distinct research streams: (1) Wildlife conservation: benefits and challenges, (2) Anthropogenic impact and animal behavioral responses, (3) Visitor perspectives: motivations, satisfaction, and human impact, and (4) Working animals: fatalities and mortality. In terms of prevalence, research streams 1 and 3 are the most extensively studied, while the negative health effects on working animals in tourism receive the least attention.

1.4.2 Contributions

This study is the first to adopt an informetric approach to provide an accessible overview of extant knowledge on animal welfare in the tourism scope. With satisfactory power (four factors explaining 57.03 per cent of total variance), it synthesizes research from 405 journal articles published from 1994 to 2023. This paper complements existing literature reviews by offering

an up-to-date, interdisciplinary meta-view of animal welfare in tourism using quantitative analysis tools, thereby enhancing the understanding of discourses and perspectives.

In terms of theoretical contributions, this study is the first to apply a bibliometric approach to investigate animal welfare and tourism, transcending disciplinary boundaries and highlighting the need for collaboration between business/tourism research and veterinary perspectives to create a sustainable environment for animals in the tourism ecosystem. Thereby, the study draws attention to a research gap in the social sciences, urging further investigation by tourism scholars. For newcomers to the field, this bibliometric study provides a quick overview of the research field, while for experienced scholars it offers insight into each sub-field's position in the animal welfare research system.

While this study is mainly directed at academic scholars, it also offers contributions for practitioners. Tourism and destination managers, as well as tour operators, can benefit from awareness of potential consequences before promoting animal-based tourism activities.

If tourism strives for sustainability, it should recognize that sustainability and its social dimension cannot be defined as exclusively human-centered (Fennell & Sheppard, 2021). Protecting animals and their habitats is closely linked to wildlife and nature conservation (Fischer et al., 2011; Harrop, 2011). Sustainable tourism, therefore, cannot be isolationist or neglect to consider animals' wellbeing.

1.4.3 Limitations and future research paths

As a limitation of this study, the author acknowledges that publications other than peer-reviewed articles were not included in the sample. Other literature reviews on the subject might want to include books (e.g. by chapters of full-text analysis), which could provide further insights. Another limitation of this study is the focus on articles in the English language only. While this approach is both common and necessary in conducting bibliometric analyses, publications in other languages might also hold interesting information. Lastly, as with any qualitative study, subjectivity in interpretation cannot fully be excluded (Kolbe & Burnett, 1991), while the mixed-method approach applied can minimize objectivity. Vice versa, the quantitative results were verified by a critical qualitative review.

Further research may want to investigate the methodology approaches of publications in animal welfare research, which could provide interesting insights. Second, due to the nature of bibliometric research, this study provides a snapshot of work published until a specific date. Still, scholarly discussions are constantly evolving and producing new findings which are not represented here.

Future research should explore travelers' associations, experiences, and motivations related to animal-based tourism. It should also consider designing alternatives that reduce animal suffering, e.g. through governmental regulation, captivity setting characteristics, and exhibition designs. Additionally, investigating the role of marketing in the animal-based tourism industry is crucial. The role of cultural relativism also merits closer consideration (Essen et al., 2020), particularly in understanding the motives or attitudes of visitors from different cultures. Further, the role technology plays might provide interesting future research avenues for the benefit of animal welfare (Essen et al., 2020), e.g. in enhancing edutainment, the use of virtual/augmented reality, or spatial visitor guidance regarding overcrowded spaces, e.g. in wildlife safaris.

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Appendix Paper 1

Appendix I: List of keywords

| | | |
|----------------------------|----------------------------------|---------------------|
| abundance | fecal_glucocorticoid_metabolites | people |
| africa | fece | perception |
| area | fishing | personality |
| asian_elephant | food-provisioning | |
| attitude | forage | |
| behavior | forest | power |
| behavioral_changes | framework | predator |
| benefit | geography | prevalence |
| biodiversity | glucocorticoid | primate |
| biodiversity_conservation | glucose | protected_area |
| bird | governance | provision |
| body_condition | habitat | public |
| captive | habituation | quality services |
| cattle | health | recreation |
| cetacean | horse | reserve |
| challenge | human_impacts | resource |
| china | human-animal_interaction | response |
| choice_experiment | human-wildlife_conflict | risk |
| climate_change | hunting | satisfaction |
| community | identity | science |
| conflict | impact | social_media |
| consequence | indicator | south |
| conservation | industry | space |
| contingent_valuation | infectious | state |
| corticosterone_metabolites | intention | strategy |
| cortisol | island | stress |
| determinant | knowledge | survival |
| disease_transmission | landscape | sustainability |
| disturbance | leisure | sustainable_tourism |
| diversity | lion | system |
| dog | livestock | thailand |
| donkey | loxodonta-africana | trade |
| ecofeminism | management | translocation |
| ecological | maximus | trophy |
| economic_value | method | value |

| | | |
|------------------------|---------------|-----------------------|
| ecosystem_services | model | visitor |
| eco-tourism | mortality | wildlife_conservation |
| education | mule | wildlife_management |
| elephant | national_park | wildlife_trafficking |
| environment | nature | willingness-to-pay |
| environmental_attitude | non-invasive | work |
| experience | pattern | |

Appendix II: Results of principal component factor analysis

| Total Variance Explained | | | | | | | |
|--------------------------|---------------------|---------------|--------------|-----------------------------------|---------------|--------------|--------------|
| Component | Initial Eigenvalues | | | Rotation Sums of Squared Loadings | | | % Cumulative |
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | |
| 1 | 19.210 | 32.559 | 32.559 | 10.338 | 17.522 | 17.522 | |
| 2 | 6.228 | 10.556 | 43.116 | 8.650 | 14.661 | 32.182 | |
| 3 | 4.778 | 8.098 | 51.213 | 7.757 | 13.148 | 45.330 | |
| 4 | 3.432 | 5.818 | 57.031 | 6.903 | 11.701 | 57.031 | |

Note: Principal component analysis. Varimax rotation with Kaiser normalization.

Appendix III: Rotated component matrix

| Component | 1 | 2 | 3 | 4 |
|--------------------|-------|-------|-------|---|
| conflict | 0.92 | | | |
| area | 0.89 | | | |
| people | 0.829 | | | |
| africa | 0.806 | | | |
| challenge | 0.787 | | | |
| knowledge | 0.768 | | | |
| governance | 0.766 | | | |
| reserve | 0.76 | | | |
| benefit | 0.753 | | | |
| nature | 0.697 | | | |
| stakeholder | 0.642 | | | |
| science | 0.563 | | | |
| perspective | 0.555 | | 0.44 | |
| abundance | 0.545 | | | |
| framework | 0.495 | | | |
| space | 0.409 | | | |
| willingness-to-pay | | | | |
| geography | | | | |
| disturbance | | 0.879 | | |
| corticosterone | | 0.801 | | |
| response | | 0.78 | | |
| fece | | 0.756 | | |
| pattern | | 0.731 | | |
| forage | | 0.698 | | |
| personality | | 0.675 | | |
| habituation | | 0.665 | | |
| consequence | | 0.664 | | |
| provision | | 0.558 | 0.461 | |
| translocation | | 0.518 | | |
| model | | 0.517 | 0.504 | |
| method | 0.422 | 0.439 | | |
| survival | | | | |
| experience | | | 0.891 | |
| visitor | | | 0.787 | |

| | | |
|--------------|-------|-------|
| satisfaction | | 0.764 |
| intention | | 0.755 |
| diversity | | 0.635 |
| leisure | | 0.604 |
| impact | 0.582 | 0.584 |
| determinant | 0.514 | 0.582 |
| strategy | | 0.575 |
| marine | 0.531 | 0.55 |
| trade | | 0.536 |
| industry | | 0.526 |
| south | 0.451 | 0.505 |
| china | 0.405 | 0.488 |
| glucose | 0.43 | 0.441 |
| identity | | |
| donkey | | 0.948 |
| work | | 0.945 |
| mule | | 0.92 |
| indicator | | 0.879 |
| prevalence | | 0.856 |
| state | | 0.596 |
| system | 0.536 | 0.596 |
| island | | 0.578 |
| thailand | | 0.509 |
| power | | 0.444 |
| mortality | | |

Note: Principal component analysis. Varimax rotation with Kaiser normalization. Rotation converged in 7 iterations.

Appendix IV: Overview of research streams in peer-reviewed articles

| Research stream | Concepts | Exemplary articles | Number of articles | Three most popular relevant journals |
|--|--|---|--------------------|---|
| ‘Wildlife conservation: Benefits and challenges’ | Conflict, Area, People, Africa, Challenge, Knowledge, Governance, Reserve, Benefit, Nature, Stakeholder, Science, Perspective, Abundance, Framework, Space | Zimmerhackel et al., (2018), Afonso et al. (2019); Jamal, 2005 | 295 | Animals (25); J. Sustain. Tour. (19); PLOS ONE (13); Tourism Manage. (12) |
| ‘Anthropogenic impact and animal behavioral responses’ | Disturbance, Corticosterone, Response, Fece, Pattern, Forage, Personality, Habituation, Consequence, Provision, Translocation, (Model, Method) | Marion et al. (2020); Chiew et al. (2019), Li et al. (2007) | 123 | <i>Animals</i> (12); <i>PLOS ONE</i> (6); <i>Zoo Biology</i> (5) |
| ‘Visitor perspectives: Motivations, satisfaction, and human impacts’ | Experience, Visitor, Satisfaction, Intention, Diversity, Leisure, Impact, Determinant, Strategy, Marine, Trade, Industry, South, China, Glucose | Christou and Nikiforou (2021), Suarez-Rojas et al. (2023), Woods (2002) | 196 | <i>Animals</i> (23); <i>J. Sustain. Tour.</i> (20); Tourism Manage. (10) |
| ‘Working animals: fatalities and mortality’ | Donkey, Work, Mule, Indicator, Prevalence, State, System, Island, Thailand, Power, Mortality | Magda et al. (2015), Pinsky et al. (2019), Ali et al. (2016) | 110 | <i>Animals</i> (17); <i>PLOS ONE</i> (7); <i>Journal for Nature Conservation</i> (4); <i>J. Sustain Tour.</i> (4) |

Appendix V: Author affiliation countries

| Country | Number of affiliations | Percentage |
|--------------|------------------------|------------|
| USA | 181 | 15.92% |
| Australia | 133 | 11.70% |
| England | 90 | 7.92% |
| Thailand | 76 | 6.68% |
| China | 66 | 5.80% |
| South Africa | 59 | 5.19% |
| Canada | 45 | 3.96% |
| Portugal | 26 | 2.29% |
| Spain | 26 | 2.29% |
| Italy | 25 | 2.20% |
| France | 23 | 2.02% |
| Switzerland | 23 | 2.02% |
| Brazil | 22 | 1.93% |
| Germany | 21 | 1.85% |
| Norway | 17 | 1.50% |
| Japan | 16 | 1.41% |
| Scotland | 16 | 1.41% |
| New Zealand | 16 | 1.41% |
| Netherlands | 15 | 1.32% |
| India | 14 | 1.23% |
| Mexico | 13 | 1.14% |
| Sweden | 13 | 1.14% |
| Austria | 9 | 0.79% |
| Ireland | 9 | 0.79% |
| Argentina | 8 | 0.70% |
| Greece | 8 | 0.70% |
| Korea | 8 | 0.70% |
| Malaysia | 8 | 0.70% |
| Nepal | 8 | 0.70% |
| Indonesia | 7 | 0.62% |
| Sri Lanka | 7 | 0.62% |
| Kenya | 6 | 0.53% |
| Philippines | 6 | 0.53% |
| Botswana | 5 | 0.44% |
| Chile | 5 | 0.44% |

| | | |
|-----------|----|-------|
| Egypt | 5 | 0.44% |
| Israel | 5 | 0.44% |
| Singapore | 5 | 0.44% |
| Tanzania | 5 | 0.44% |
| Other | 87 | 7.65% |

Appendix VI: Publications per research area

| Research Area | Publications |
|--|--------------|
| Environmental Sciences & Ecology | 18.05% |
| Social Sciences – Other Topics | 11.59% |
| Veterinary Sciences | 10.94% |
| Zoology | 10.54% |
| Science & Technology – Other Topics | 8.17% |
| Biodiversity & Conservation | 6.85% |
| Agriculture | 6.19% |
| Business & Economics | 4.35% |
| Sociology | 3.56% |
| Marine & Freshwater Biology | 1.84% |
| Behavioral Sciences | 1.45% |
| Geography | 1.32% |
| Anthropology | 1.19% |
| Oceanography | 1.05% |
| Water Resources | 0.92% |
| International Relations | 0.66% |
| Life Sciences & Biomedicine – Other Topics | 0.66% |
| Development Studies | 0.53% |
| History | 0.53% |
| History & Philosophy of Science | 0.53% |
| Infectious Diseases | 0.53% |
| Parasitology | 0.53% |
| Plant Sciences | 0.53% |
| Public Administration | 0.53% |
| Tropical Medicine | 0.53% |
| Other | 6.46% |

2 P2. Tourists' Implicit Attitudes Towards Close Wildlife Interactions and the Effectiveness of an Animal-Welfare-Framed Warning Message

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Abstract

Close physical interactions with captive wildlife, such as tiger petting or koala cuddling, are popular tourist attractions but raise significant animal welfare concerns. Previous research has relied primarily on explicit self-reports, which may be influenced by social desirability and unconscious biases. This study addresses these limitations by comparing implicit and explicit attitudes toward close wildlife interactions among 1,072 respondents in Germany and the UK, utilizing a Single-Category Implicit Association Test (SC-IAT) and a structured questionnaire. Results show that a negatively framed warning message highlighting animal welfare issues significantly reduced favorable attitudes on both explicit and implicit measures, with a particularly strong effect among women. The warning message had a greater impact on implicit (unconscious) attitudes than on explicit ones, indicating that travelers may not be fully aware of their underlying beliefs. Additionally, the Animal Attitude Scale was negatively correlated with both attitude measures, suggesting that greater concern for animal welfare predicts less favorable views of close wildlife interactions. These findings underscore the value of implicit attitude measurement in tourism research and support the use of targeted warning messages and awareness campaigns to discourage participation in harmful wildlife attractions.

Citation: n.a.

(Under review at *Journal of Sustainable Tourism*)

2.1 Introduction: Close wildlife interactions in tourism

Interacting in direct physical contact with wild animals in captivity (*close wildlife interactions*), such as tiger petting, dolphin swimming, or koala cuddling, has become a common tourist attraction (D'Cruze et al., 2019). In accordance, animal-based tourism (Orams, 2002) is experiencing a rapid increase in demand for activities that allow close interactions with wild animals (Blaer, 2022; Carr & Broom, 2018), resulting in the creation of innumerable animal-related tourist activities (Kim et al., 2023) with more than 700 million visitors annually (WAZA, 2025). The market for wildlife tourism was valued at \$150.6 billion in 2023 and is projected to grow to \$316.2 billion by 2033, reflecting a compound annual growth rate of 7.7% (Pangarkar, 2025). However, the effects of this industry are detrimental for animal welfare and biodiversity: Captive animals are confined to small enclosures and lack the freedom to roam independently (Schmidt-Burbach et al., 2015). Many of them are originally taken from the wild and are often held under inadequate conditions of limited space, artificial substrates, reduced social interaction with their species, or lack of stimulation (Schmidt-Burbach et al., 2015). Many facilities also do not provide adequate veterinary care, all of which contributes to the development of severe physical or psychological damage expressed in stereotypies, self-mutilation or aggression (Morgan & Tromborg, 2007; Schmidt-Burbach et al., 2015). Species commodified in such attractions are frequently classified as vulnerable or endangered, exacerbating conservation challenges (D'Cruze et al., 2018). In the absence of global regulations and accreditation systems (Moorhouse et al., 2017), financial incentives often take precedence over animal welfare.

Despite the widespread commercial exploitation of animals for entertainment, research on the effects of tourism on animal welfare remains limited (Schweiggart, 2024). While scholars have increasingly emphasized the need to study and improve animal welfare in tourism—reflected in curated collections from *Annals of Tourism Research* (Winter, 2020), the *Journal of Sustainable Tourism* (Vol. 31, 2023), and *Current Issues in Tourism* (Carr, 2009)—a significant knowledge gap persists. As Winter (2020, p. 18) notes, “there is a substantial gap in our knowledge to explain why so many tourists fail to change their behaviour, and perhaps the use of a scale [...] could be used to measure large scale samples of tourists.”

Few studies have investigated tourists' attitudes towards animal-based attractions (e.g., Flower et al., 2021; Shani, 2012; Ballantyne et al., 2009), however, using only self-reports measuring explicit attitudes. These self-reported attitudes may be biased by social desirability (Hinshaw & Stier, 2008), as tourists experience cognitive dissonance when confronted with ethical

dilemmas (Winter, 2020). Early studies suggest that tourists are not indifferent to animal welfare (Moorhouse et al., 2015), yet many remain unaware of their own impact (Rizzolo, 2023; Moorhouse et al., 2017). In line with this, research indicates that educational interventions can reduce harmful visitor behavior at wildlife attractions (Collins et al., 2019). In a pioneering choice experiment, Moorhouse et al. (2017) explored whether priming tourists with animal welfare information influences their choices for ethical versus unethical wildlife attractions. Their findings highlight the potential of such interventions to promote more ethical tourism decisions, providing a basis for further research on the cognitive and emotional processes involved.

Therefore, further investigation is needed to determine whether providing tourists with information—such as warning messages or labels—could not only influence their explicit but also implicit attitudes and decision-making. Such warnings inform consumers about health risks, promote safer choices, and shape social norms (Stewart & Martin, 1994; Ares et al., 2023) and are common in other animal welfare contexts—e.g., on meat products, cage-free eggs, and animal-tested goods (BMEL, 2023). However, their use in tourism remains largely unexplored (Fennell, 2023). Building on insights from dual-information processing (Tse & Tung, 2020) and the 'peripheral' elaboration route rather than cognitive processing (Font, English, & Gkritzali, 2018), this study hence examines how warning messages affect both implicit and explicit attitudes toward close animal interactions.

Over the past two decades, scholars have developed various measures to examine attitudes in dual-process models, particularly in contexts involving stigma or bias. Among the most prominent is the implicit association test (IAT), introduced to address limitations of self-report tools and their issues with social desirability bias and restricted introspective access (Greenwald & Banaji, 1995; Nosek et al., 2005). Despite criticism (e.g., Schimmack, 2019), projective methods like the IAT assess automatic associations without relying on potentially biased explicit responses (Luchs et al., 2010). However, IAT applications in tourism and animal welfare research remain scarce, with a few exceptions (e.g., Vaughn et al., 2021; Tabatabaei & Beldona, 2024; Tse & Tung, 2020). Notably, Tse and Tung (2020) revealed implicit biases and a disconnect between implicit and explicit attitudes, underscoring the need for dual measurement approaches to fully capture animal welfare concerns.

This study first examines the applicability of the Single-Category IAT (SC-IAT) (Karpinski & Steinman, 2006) in measuring tourists' attitudes toward close wildlife interactions. Given valid criticism of implicit measures, the IAT is not used in isolation (Schimmack, 2021); instead, we

compare SC-IAT results with explicit attitudes assessed via questionnaire ($n = 1,072$). Second, we test the effectiveness of an experimental warning message on negative animal welfare impacts. In one treatment group, the intervention assesses whether such information influences implicit and/or explicit attitudes. Findings may benefit conservation organizations, pro-wildlife tourism operators, and policymakers seeking to implement warning labels, social marketing, and educational campaigns to promote ethical tourism.

2.2 Literature review and hypothesis development

2.2.1 Measuring tourists' attitudes of animal tourism

Previous studies have investigated tourists' attitudes towards the use of animals in tourism (Shani, 2009; Shani, 2012; Moorhouse et al., 2019; Moorhouse et al., 2015). Findings indicate that most tourists are unaware of their activities' negative impact on animal welfare (Moorhouse et al., 2017; Rizzolo, 2023). Many perceive animal entertainment positively, even when it harms welfare or conservation, especially if they believe the animals are well cared for (Fennell, 2015; Moorhouse et al., 2016). Tourists tend to object only to overt mistreatment (Moorhouse et al., 2015). Curtin and Wilkes (2007) found that despite opposing dolphin captivity, visitors prioritized personal enjoyment, illustrating cognitive dissonance. This suggests tourists care about animal welfare but lack species-specific knowledge to make ethical choices (Moorhouse et al., 2017). The issue is exacerbated by misleading claims from animal attractions regarding welfare standards (Moorhouse et al., 2016).

However, the traditional questionnaires used in assessing attitudes toward animal use may be biased by social desirability (Babakhani et al., 2019) and stigma (Swanson et al., 2001), as harming animals is generally stigmatized in Western cultures (Burke et al., 2023; Swanson et al., 2001). Stigmatized behaviors—such as smoking (Swanson et al., 2001), gambling (Hing et al., 2014), and drug use (Field et al., 2004; Wiers et al., 2002)—persist despite moral objections, often leading individuals to justify their actions. Swanson et al. (2001) found that smokers' explicit attitudes were slightly negative, yet their implicit attitudes remained positive ('dissociation'), a pattern also observed in meat consumption (Loughnan et al., 2010). Given this, explicit attitudes toward animal use in tourism should be examined alongside implicit attitudes. While significant differences between Germany and the UK are unlikely, support for animal welfare is particularly strong in Britain (Pifer et al., 1994; Phillips et al., 2012).

Explicit and implicit attitudes toward close wildlife interactions are shaped by general attitudes toward animals. The Animal Attitude Scale (AAS), widely used to assess animal protection

attitudes, has demonstrated strong psychometric properties (Herzog et al., 2015). On the refined 10-item scale (Herzog et al., 2015), higher AAS scores reflect greater concern for animal welfare, empathy, and a commitment to ethical treatment. Given that some animal activities harm welfare, we hypothesize that individuals with higher AAS scores will be less supportive of close wildlife interactions.

H1: Higher levels of concern for animal welfare are associated with more negative attitudes towards close wildlife interactions.

Herzog et al. (2015) found that males generally show less concern for animal welfare than females, with masculinity linked to reduced sensitivity to ethical treatment of animals. In contrast, greater concern for animal welfare was associated with femininity and lower comfort in touching animals, particularly those considered "nice" to touch. Similar findings were reported by Phillips et al. (2010), Herzog (2007), and Allcorn and Ogletree (2018). Based on these results, we hypothesize that women will be less inclined toward close wildlife interactions than men, both implicitly and explicitly, due to higher AAS scores and lower comfort in interacting with animals.

H2a: Women exhibit significantly higher levels of concern for animal welfare compared to men.

H2b: Women hold significantly less positive attitudes towards close wildlife interactions compared to men.

2.2.2 Attitude changes with warning intervention

The acquisition of new information can lead to attitude change (Ajzen, 1991). Studies show that tourists exposed to negative welfare and conservation ratings of wildlife attractions are 3 to 13 times more likely to avoid them (Moorhouse et al., 2017). Those who believed animals were well cared for felt their experience was enhanced, while those who perceived neglect had a diminished impression (Grennan & Fielding, 2008). Tourists may also experience discomfort or guilt after visiting unethical animal attractions (Shani, 2009), a manifestation of cognitive dissonance resulting from the gap between a person's values and actions (Festinger, 1957). Given this, we assume that tourists are generally eager to select "moral" animal attractions; if presented with negative information, they will adjust their attitudes toward the respective attraction. We apply the concept of stigma to visiting "bad" wildlife facilities using a negatively framed warning message (e.g., Neubig & Roosen, 2024). Thus, we argue that tourists exposed to a warning message about the negative animal welfare effects of these activities will express more negative explicit attitudes, as predicted by social desirability bias.

H3a: *Warning messages have a negative impact on tourists' explicit attitudes towards close wildlife interactions.*

H3b: *Warning messages have a negative impact on tourists' implicit attitudes towards close wildlife interactions.*

Building on H1, we argue that attitudes toward close wildlife interactions are closely linked to general concern for animal welfare. Previous studies have found, for instance, that individuals who care more about animal rights are more sensitive to disgust induced by meat consumption than those who support animal use (i.e., individuals with more positive attitudes toward animal use and lower AAS scores) (Herzog & Golden, 2009). More specifically, we expect that individuals with greater concern for animal welfare will be more influenced by a negatively framed warning message. Furthermore, since a higher AAS score indicates greater concern for animal welfare (Herzog et al., 2015), we anticipate that individuals with high AAS scores will be more responsive to a warning message than those with low AAS scores, leading to H4.

H4: *The effect size of warning messages on tourists' attitudes towards close wildlife interactions is higher for individuals with higher levels of concern for animal welfare.*

2.3 Materials and Method: Experimental setup and data collection

Before the main test, we conducted two pre-tests. In Pre-test 1, 322 consumers from the UK and Germany evaluated images of close wildlife interactions on a Likert scale (see *stimuli selection*). Based on these ratings, we selected suitable images for our SC-IAT stimuli. Pre-test 2, with 134 respondents, tested the experimental setup, including the questionnaire, SC-IAT, and intervention. This allowed us to resolve technical issues and ensure construct reliability for explicit attitude questions and internal consistency for the SC-IAT.

For the main study, data were collected in November 2024 from 1,354 respondents in the UK and Germany via an online panel provider. The survey was divided into two parts, both measuring the same construct: First, the SC-IAT, a specific version of the traditional IAT (Greenwald & Banaji, 1995), assessed implicit attitudes toward "pleasure" in close wildlife interactions, a dimension previously established by Swanson et al. (2001) and Bellezza et al. (1986). Then, respondents completed a questionnaire measuring explicit attitudes through semantic differential scales and a thermometer scale (Swanson et al., 2001), allowing for a

composite score. The survey was designed in English, then translated into German by three native speakers and back-translated for accuracy.

To assess whether a warning message can manipulate tourists' attitudes toward close wildlife interactions (e.g., Neubig & Roosen, 2024; Stewart & Martin, 1994), participants were randomly assigned to one of two groups. Only Treatment Group 2 received the warning message before completing the SC-IAT and questionnaire. Both groups were shown neutral introductory information about close wildlife interactions. Participants completed the SC-IAT before the self-report questionnaire to minimize potential order bias (Nosek et al., 2005; Tabatabaei & Beldona, 2024). A screening question was included in both the pre-test and main study, excluding respondents who travel internationally for leisure less than once a year.

2.3.1 Single-Category IAT

2.3.1.1 SC-IAT setup

The IAT, developed by Greenwald et al. (1998), is the most widely used method for measuring implicit attitudes by assessing reaction times to categorize stimuli. This indirect approach uncovers affective associations, based on the assumption that individuals more easily categorize stimuli aligned with their beliefs (Fazio & Olson, 2003; Tercia et al., 2021). While not without criticism (Kurdi et al., 2021), the IAT is well-established and has been successfully adapted across various contexts (Friese et al., 2006; Maison et al., 2004). Unlike the traditional IAT, the SC-IAT (Karpinski & Steinman, 2006) focuses on a single object, providing a relative measure of a respondent's preference for that object rather than comparing two.

Participants were instructed to use a desktop or laptop with a keyboard, and a filter question excluded those using smartphones or tablets. Each (SC-)IAT procedure involved a computerized task in which participants were presented with a series of stimuli consisting of pictures and words. Participants then received "game instructions," guiding them to categorize each stimulus quickly and accurately by pressing the "E" key for the left side and the "I" key for the right. Following established SC-IAT protocols, the stimuli were categorized into three distinct groups: (a) a target concept representing the object being evaluated (*wildlife interaction*) and (b) two contrasting attribute categories (*pleasant* and *unpleasant* words) displayed at the top of the screen (left and right). Participants were instructed to assign each stimulus to the appropriate category while their reaction times were recorded in the background (see Appendix B).

The first half of the IAT paired *pleasant* words with *wildlife interaction*, while the second half paired *unpleasant* words with *wildlife interaction*, enabling the measurement of the relative strength of associations between categories. Subtracting the scores from the two conditions reveals differences in reaction times, theoretically measuring implicit bias by showing how quickly individuals associate concepts in congruent versus incongruent pairings (i.e., implicitly favoring wildlife interactions as pleasant over unpleasant). To minimize learning effects, only the second round of each pairing (Blocks 2 and 4) was analyzed. Respondents were informed that Rounds 1 and 3 were practice rounds designed to familiarize them with the task. The procedure is depicted in Table 10.

Table 10. SC-IAT procedure.

| Blocks | Trials | Function | Left-key response | Right-key response |
|--------|--------|----------|------------------------|--------------------------|
| 1 | 24 | Practice | Pleasant + Wildl. Int. | Unpleasant |
| 2 | 72 | Test | Pleasant + Wildl. Int. | Unpleasant |
| 3 | 24 | Practice | Pleasant | Unpleasant + Wildl. Int. |
| 4 | 72 | Test | Pleasant | Unpleasant + Wildl. Int. |

Note. "Wildl. Int. = Wildlife interaction

2.3.1.2 Stimuli selection

Word stimuli. The word stimuli were based on those used by Swanson et al. (2001) (Experiment 3) to assess the 'pleasure' dimension of an object. Thus, to assess attitudes of pleasure toward close wildlife interactions, the following stimuli were used for the UK sample with a translated version for the German sample:

pleasant: cuddle, happy, smile, joy, warmth, peace, paradise, love

unpleasant: pain, awful, disaster, grief, agony, brutal, tragedy, bad

Image stimuli. For the image stimuli of close wildlife interactions, the authors sourced images from TripAdvisor, showcasing well-known tourist attractions where animals can be touched or held. To minimize potential biases, all human faces and clothing brands were blurred. The images depicted direct physical interactions between tourists and captive wildlife. Species selection for the visual stimuli was based on the concept of non-human charisma (Lorimer, 2016), featuring species generally considered 'cute' or 'cuddly' (Macdonald et al., 2015). While we acknowledge the widespread use of other taxonomies in tourism interactions—such as fish, birds, or sharks—they are also known to evoke fear or phobias (Vaughn et al., 2021). In our pre-test, we tested 30 images to assess their suitability as stimuli, accounting for potential

biases, environmental context, photo backgrounds, and image quality. In this test, 332 respondents from the UK and Germany, unrelated to the main samples, rated each image on a Likert scale (1 = not at all pleasant, 5 = extremely pleasant). Based on the results, images depicting tiger interactions were excluded. Based on the mean ratings and overall distribution, nine final images were selected as stimuli (see Appendix A).

2.3.2 Explicit attitudes

To assess explicit attitudes, we used two questions based on Swanson et al. (2001) and Greenwald et al. (1998). Following Karpinski and Hilton (2001), we employed bidimensional scales—feeling thermometer and semantic differential—for comparison with IAT results. Accordingly, respondents first reported their personal attitudes toward wildlife interactions on a feeling thermometer (0–100), with higher values reflecting warmer, more favorable attitudes and lower values indicating colder, more negative perceptions. To prevent unintentional responses, the slider was set to 0 by default.

Next, respondents rated their attitudes toward close wildlife interactions using five semantic differential items (Swanson et al., 2001). On a scale from −3 to +3, they evaluated interactions based on paired adjectives: *bad–good*, *harmful–beneficial*, *ugly–beautiful*, *unpleasant–pleasant*, and *stressful–calming*. These scores were combined into a composite measure of 'pleasure,' where higher values indicate more positive attitudes. Schimmack (2019) stresses the importance of convergent validity in IAT research, advocating for independent measures of the same construct (e.g., IAT) and discriminant validity with distinct constructs (e.g., IAT vs. the feeling thermometer). Since the SC-IAT assesses only one target concept, no difference scores were calculated, as per Swanson et al. (2001). The questionnaire also included covariates: the 10-item Animal Attitude Scale (AAS) (Herzog et al., 2015; Appendix C), along with age, gender, and education. The full questionnaire is in Appendix D.

2.3.3 Warning message

The warning message, administered to half of the respondents, served as a priming mechanism—activating specific ideas, categories, or emotions before assessing their impact on subsequent tasks (Cameron et al., 2012). Research on CSR priming suggests negative priming influences consumer attitudes by evoking emotions like guilt (Stadlthanner et al., 2022). Studies also indicate negatively framed messages are more effective than positive ones in altering tourist behavior (Lin et al., 2024; Randle et al., 2019). Accordingly, this study applied a negatively framed warning message, presented only to Treatment Group 2, to induce potential

attitude shifts based on animal welfare concerns. Following Moorhouse et al. (2017), the message detailed the psychological and physiological consequences of captivity, poor conditions, and conditioning. It also featured an imitation logo of a hypothetical animal protection group, resembling promotional materials from real organizations, and included both text and images (see Figure 9).



Figure 9. Warning message (English version). Own illustration.

2.4 Data analysis and results

2.4.1 Data analysis

2.4.1.1 Data processing and consistency tests

Of the 1,354 completed responses (641 unprimed, 713 primed), we excluded cases where browser-based automatic translations were detected (leaving 611 and 692 responses, respectively), along with any responses from non-desktop devices. After these exclusions, 1,219 full responses remained (576 unprimed, 643 primed) for analysis. To determine the necessary sample size, we conducted an a priori power analysis for F-tests using G*Power (version 3.1.9.4) with the following parameters: a two-tailed test, $\alpha = 0.05$, power = 0.80, and an equal allocation ratio between groups. The required sample size per group was calculated as 344, with critical F values of 0.8089 (lower limit) and 1.2361 (upper limit).

Additionally, a sensitivity analysis assessed how variations in effect size and sample size impacted statistical power. For the smallest subgroup comparison (Male—No Warning vs. Warning), the total sample was 386 (180 unprimed, 206 primed). The study was sensitive enough to detect an effect size of $d = 0.3362$, approximately one-third of a standard deviation

difference between groups. This ensured the study was adequately powered to produce reliable conclusions.

The mean score for the thermometer scale (ranging from 0 to 100) was calculated. To ensure that the semantic differential items reliably measured the underlying construct of pleasant attitudes, Cronbach's alpha (Cronbach, 1951), average variance extracted (AVE), and composite reliability were assessed. The results demonstrated strong internal consistency and reliability across both groups, with Cronbach's alpha values of 0.953 and 0.951, composite reliability of 0.96, and an AVE of 0.84. These findings confirm that the selected items effectively captured the intended construct.

2.4.1.2 D score calculation

To determine the D score, construct reliability within the SC-IAT was calculated following the procedure outlined by Karpinski and Steinman (2006). Each level was divided into thirds, creating blocks of 24 subsequent trials. Distinct scores per participant were computed for each third without dividing by the standard deviation of correct response times. The average intercorrelation among the three scores provided a measure of internal consistency. In the Non-Warning SC-IAT, block correlations were 0.892 (block 1 and 2), 0.827 (block 1 and 3), and 0.838 (block 2 and 3), resulting in an average r of 0.85. Applying the Spearman-Brown correction, as proposed by Karpinski and Steinman (2006), yielded a reliability of 0.95. Similarly, in the Warning SC-IAT, the correlations were 0.940, 0.895, and 0.878, producing an average r of 0.90 and a corrected reliability of 0.97. This corrected reliability, conceptually comparable to Cronbach's alpha, confirms that the SC-IAT in both treatment groups demonstrates excellent internal consistency, likely due to the rigorous data cleaning approach.

To calculate the D score (Nosek et al., 2014), we calculated the sum of correct trials (dichotomized) for stimuli responses in blocks 2 and 4 for each respondent. A quality check was applied, retaining only those with at least 66.67% correct trials. Trials with response times exceeding 10,000 milliseconds or falling below 350 milliseconds were excluded to eliminate disengaged or reflexive responses (Greenwald et al., 1998). Following these exclusions, the final sample comprised 1,072 responses. Then, we calculated the means for each subject at the relevant levels (2 and 4) and determined the pooled standard deviations for those levels. Incorrect trials were adjusted by replacing the specific response time with the mean response time for that level. We then computed the adjusted means for both levels and derived the mean difference between them. Since level 2 associated *wildlife interactions* with the *pleasant*

dimension and level 4 linked them with the *unpleasant* dimension, a higher D score indicated a more positive (pleasant) attitude toward wildlife interactions, whereas a lower or negative score reflected a less favorable or negative attitude.

2.4.2 Results

Table 11 shows the results for both implicit and explicit descriptive measurements. In the subsequent subchapters, they are discussed in greater detail.

Table 11. Descriptive statistics

| Variables | Non-Warning | | | Warning | | |
|--------------------------|-------------|---------|---------|---------|---------|---------|
| | Overall | Female | Male | Overall | Female | Male |
| <i>Implicit measures</i> | | | | | | |
| D-Score | -0.0338 | -0.0356 | -0.0273 | -0.3471 | -0.3808 | -0.2882 |
| <i>Explicit measures</i> | | | | | | |
| Semantic differential | -0.1121 | -0.2091 | 0.0801 | -0.8471 | -1.0389 | -0.5136 |
| Thermometer | 40.70 | 37.61 | 46.55 | 31.50 | 28.56 | 36.58 |
| AAS | 3.72 | 3.80 | 3.57 | 3.76 | 3.85 | 3.59 |
| n | 511 | 330 | 181 | 560 | 350 | 206 |

Note. Six participants did not identify as either male or female (overall sample). Due to the low number of observations, these had to be excluded from the analysis.

2.4.2.1 Implicit attitudes

As shown in Table 11, implicit attitudes toward animal experiences, measured by the D score, were generally neutral in the unprimed group (-0.03) but shifted negatively in the primed group (-0.35). This suggests that exposure to a warning message before SC-IAT participation led to more negative implicit attitudes. When comparing the UK and Germany, unprimed UK respondents showed more negative implicit attitudes (-0.06 for females, -0.18 for males), while German respondents had neutral to slightly positive attitudes (-0.02 for females, 0.12 for males). Although the warning message negatively influenced attitudes in both countries, its effect was more pronounced in Germany (delta: -0.4). In other words, tourists generally showed neutral implicit attitudes toward close wildlife interactions, though with considerable variability. No significant gender differences were found in implicit attitudes before the warning message.

Before the D score became widely used, researchers often used Cohen's d (Cohen, 1988) as a standardized effect size measure in IAT studies (e.g., Nosek et al., 2002; Sabin et al., 2012). We applied Cohen's d alongside the D score to quantify priming effects between treatment groups by calculating the difference between mean response latencies in the congruent (block 2) and incongruent (block 4) conditions, dividing by the pooled standard deviation, and using a one-sample t-test to assess IAT effects (e.g., Nguyen, 2022). Cohen's d was computed for both implicit and explicit changes, with all d values presented in Appendix E. For the overall implicit comparison, the calculated d value was -0.499 . According to Cohen's (1988) guidelines, a d of 0.20 indicates a small effect, 0.50 a medium effect, and 0.80 a large effect. Therefore, the negative warning message had a medium effect on implicit associations in the overall group comparison.

D score gender comparison. Both male and female respondents initially showed neutral implicit attitudes without receiving a warning message (D scores of -0.04 for both genders). After administering the warning message, the D scores shifted to -0.38 for females and -0.29 for males, indicating more negative attitudes (delta total: -0.31 , delta for females: -0.35 , delta for males: -0.26). In terms of Cohen's d , these shifts correspond to medium-strength effects for females (-0.56) and males (-0.40) (Appendix E). These findings suggest that women are more susceptible to changes in their implicit attitudes due to the warning message than men.

Cross-country comparisons revealed that UK participants held slightly more negative attitudes than those in Germany, aligning with previous studies highlighting the UK's strong focus on animal welfare (Phillips et al., 2010). However, given the cultural similarities between Germany and the UK, greater differences might emerge in comparisons with more distinct cultural contexts, such as Asian countries (Packer et al., 2014; Moorhouse et al., 2019), offering a direction for future research.

2.4.2.2 Explicit attitudes and AAS

Thermometer score. Respondents were asked to rate their attitudes toward animal experiences using a thermometer scale. Before receiving the warning message, the average score for participants was 40.70 out of 100, suggesting an attitude toward close wildlife interactions below neutral. The standard deviation was high ($SD = 32.76$). Both the UK and Germany showed similar average attitudes. Unprimed men had a more positive explicit attitude (46.55) than unprimed women (37.61; delta = 8.94). After the warning message, the average thermometer score dropped to 31.50 ($SD = 29.61$), with women at 28.56 and men at 36.58. The warning message led to a substantial decrease in explicit attitudes: -9.2 for all participants,

–9.97 for women, and –9.05 for men. Women initially held more negative explicit attitudes and were more responsive to the negatively-framed priming, though the effects, measured in Cohen's d , were relatively small (–0.30 for the entire sample, –0.29 for females, –0.31 for males).

Semantic differential items. As a second measure of explicit attitudes, respondents rated animal experiences on a set of semantic differential items (–3 to +3), which were aggregated into a single score. Prior to the analysis, we tested the items for Cronbach's alpha (0.953 and 0.951), composite reliability (0.96 for both groups), and average variance extracted (AVE) (0.84 for both), all yielding satisfactory results for construct reliability. The results showed an approximately neutral a priori attitude of –0.1121, with women exhibiting more negative attitudes (–0.21) than men (0.08). Respondents who received the warning message exhibited more negative attitudes on average (–0.85), with notable gender differences (–1.04 for women and –0.51 for men). In terms of effect size measured by Cohen's d , medium effects were observed for females and the overall sample (–0.42, –0.47), and small effects for men (–0.36).

In other words, explicit attitudes without the warning intervention were slightly negative, with significant gender differences—men held more positive attitudes than women, supporting H2b. Women also scored higher on the AAS (3.8 vs. 3.57), confirming greater concern for animal welfare (H2a), consistent with previous findings (Herzog et al., 2015; Phillips et al., 2010; Allcorn & Ogletree, 2018).

Following the warning intervention, participants exhibited significantly more negative explicit attitudes, confirming H3a that warning messages have a negative impact on tourists' explicit attitudes towards close wildlife interactions. More notably, implicit attitudes declined even further than explicit ones, suggesting attitude shifts beyond social desirability effects, thereby confirming H3b. Across all dimensions, women were more influenced by the warning than men, indicating gender differences shaped by broader societal factors.

Reflecting on the D-score values, thermometer, and semantic differential scales, we can initially confirm our hypothesis H2b (*Women hold significantly less positive attitudes towards close wildlife interactions compared to men*). Table 11 summarizes attitude changes across all measurements, comparing differences between the two treatment groups, standardized by Cohen's d . However, their significance can only be verified through t-tests.

AAS. Lastly, we examined how attitudes toward animal interactions are connected with the Animal Attitude Scale (AAS). The results indicated that AAS scores remained relatively stable

across both treatment groups, suggesting that the AAS is independent of the warning intervention. This is also reflected in the very small Cohen's d values (0.06, 0.08, 0.03). However, we observed differences in AAS scores between male and female respondents, with females scoring higher (3.80) than males (3.57). This supports H2a, suggesting that women exhibit higher levels of concern for animal welfare than men. Figure 10 provides an aggregated overview across treatment groups, highlighting attitude changes following the warning intervention. Notably, the most pronounced negative effects were observed in implicit attitudes and semantic differential scores, whereas changes in the thermometer scores were less significant. Interestingly, women showed more pronounced attitude shifts than men, while AAS scores only increased marginally with the intervention.

Warning messages had the strongest impact on respondents with high AAS scores, meaning those with greater concern for animal welfare were more susceptible to negative information. These individuals showed greater shifts in semantic differential, thermometer scores, and implicit attitudes compared to those with lower AAS scores, suggesting that stronger animal welfare beliefs make individuals more receptive to messages discouraging wildlife interactions. Although correlations were not significant (failing to confirm H4), the findings highlight the importance of tailoring messages to audience predispositions. Notably, AAS scores remained stable, indicating that while general perceptions of animals were unchanged, participants' enjoyment of wildlife interactions declined. Overall, higher AAS scores were associated with less favorable attitudes toward close wildlife interactions, supporting H1. However, the stronger correlation between AAS and explicit attitudes than implicit attitudes suggests the presence of social desirability bias and other situational influences.

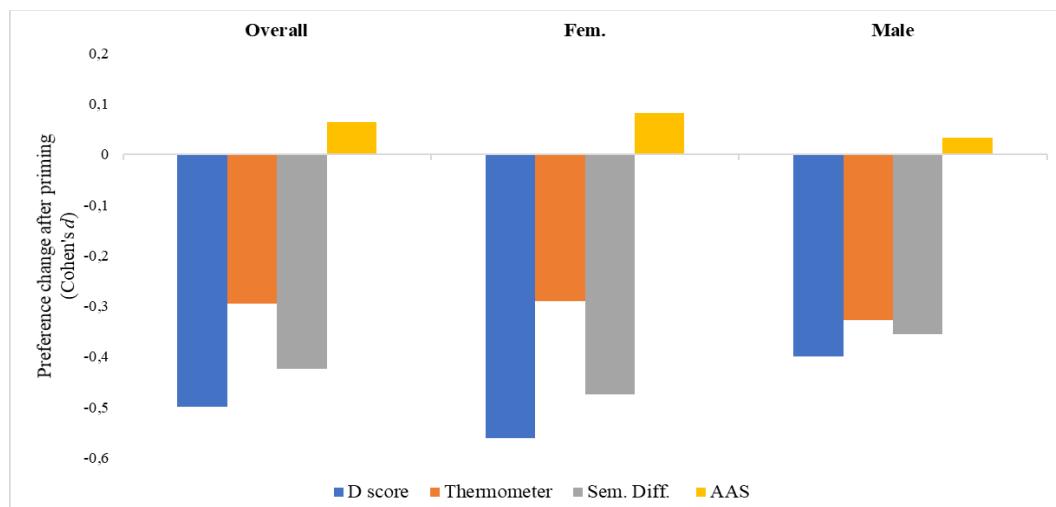


Figure 10. Implicit, explicit, AAS attitude changes towards close wildlife interaction after warning message. Own illustration.

Note. Positive Cohen's d reflects a positive attitude towards close wildlife interactions; negative values reflect a negative attitude. For exact values please see Appendix E.

2.4.2.3 Correlation effects

To assess the strength of the relationship between implicit and explicit measurements, a correlation analysis was conducted (Greenwald et al., 1998; Karpinski & Hilton, 2001). Prior to this, we performed a Shapiro-Wilk test (Razali & Wah, 2011), which confirmed that the variables were not normally distributed. An examination of the standardized and unstandardized residuals further indicated that the data were unsuitable for Pearson correlation (no normal distribution; $p < 0.001$). Consequently, a Spearman correlation was applied between implicit and explicit variables. The results showed a moderate correlation between implicit and explicit attitudes ($\rho = 0.415$, $p < 0.001$ for one group; $\rho = 0.26$, $p < 0.001$ for the other). Additionally, AAS scores exhibited a small negative correlation with the implicit D score ($\rho = -0.14$) and a moderate negative correlation with explicit attitudes ($\rho = -0.29$ and $\rho = -0.27$; both $p < 0.01$). In other words, higher AAS scores are associated with more negative attitudes towards close wildlife interactions, although the effect sizes are relatively small in this sample. This supports our hypothesis H1: Higher levels of concern for animal welfare are associated with more negative attitudes toward close wildlife interactions.

Table 12. Spearman correlation of AAS, implicit and explicit attitudes.

| | AAS | SC-IAT | Sem. Diff. | Thermometer |
|-------------|-----------|-----------|------------|-------------|
| AAS | 1.000 | -0.142*** | -0.289*** | -0.266*** |
| SC-IAT | -0.142*** | 1.000 | 0.415*** | 0.264*** |
| Sem. Diff. | -0.289*** | 0.415*** | 1.000 | 0.532*** |
| Thermometer | -0.266*** | 0.264*** | 0.532*** | 1.000 |

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $n = 1,071$

2.4.2.4 T tests

To test hypotheses H2-H4 beyond descriptive analyses, we performed a series of two-tailed t-tests. For hypothesis H2a, we examined the AAS means between genders. Prior to conducting the analyses, we performed a Kolmogorov-Smirnov test to check the normality of the data distribution. The results showed that the data did not significantly deviate from a normal distribution ($p > 0.05$), confirming that the assumption of normality was met and parametric tests could be used.

A paired-samples t-test on the sample without intervention revealed that the AAS means were significantly higher for women ($M = 3.80$, $SD = 0.62$) compared to men ($M = 3.58$, $SD = 0.63$) ($t(509) = -3.9$, $d = 0.62$, $p < 0.001$). This confirms hypothesis H2a: women exhibit significantly higher levels of concern for animal welfare than men. It is worth noting that the standard deviation was relatively large, with individual AAS scores ranging from 1.7 (min.) to 5.0 (max.).

Despite a significant Kolmogorov-Smirnov test result ($p < 0.001$), the large sample size of over 500 participants allows the Central Limit Theorem to ensure that the sampling distribution of the mean is approximately normal, justifying the use of t-tests (Vats et al., 2019). For H2b, the t-test on the sample without intervention revealed that the mean D scores between women ($M = -0.4$, $SD = 0.61$) and men ($M = -0.3$, $SD = 0.71$) were not significantly different ($t(508) = 1.3$, $p = 0.890$; $d = 0.01$). Rather, the D scores showed large variations (min: -2.6, max: 2.1), which seem to be determined by individual attitudes rather than gender identification. However, we found (marginally) significant gender differences for the explicit scores, i.e., mean semantic differential scores (Kolmogorov-Smirnov: $p < 0.001$) between women ($M = -0.21$, $SD = 1.87$) and men ($M = 0.80$, $SD = 1.65$) ($t(509) = 1.75$, $p = 0.08$, $d = 0.16$) and the thermometer score between men ($M = 46.55$, $SD = 31.62$) and women ($M = 37.61$, $SD = 32.97$) ($KS < 0.001$; $p < 0.003$; $t(509) = 2.98$; $d = 0.28$). In general, semantic differentials, without administering the intervention, varied between -3 and 3 (i.e., the full given range). Similar effects were found for the thermometer scale (min: 0; max: 100). In summary, the results verify H2b ("Women hold significantly less positive attitudes towards close wildlife interactions compared to men").

Third, we hypothesized that the warning message would negatively impact tourists' explicit attitudes towards close wildlife interactions. To test this, two t-tests were performed on the semantic differential and thermometer scores between the two treatment groups. The results revealed significant differences for both measures. For the semantic differential, the means were $M_{\text{no-warning}} = -0.11$; $SD_{\text{no-warning}} = 1.8$; $M_{\text{warning}} = -0.85$, $SD_{\text{warning}} = 1.67$ ($t(1069) = 6.9$, $p < 0.001$, $d = 0.42$). For the thermometer score, the means were $M_{\text{no-warning}} = 40.64$; $SD_{\text{no-warning}} = 32.76$; $M_{\text{warning}} = 31.50$, $SD_{\text{warning}} = 29.61$ ($t(1069) = 4.8$, $p < 0.001$, $d = 0.29$). Based on these findings, we accept hypothesis H3a, which posits that the warning message negatively impacts tourists' explicit attitudes towards close wildlife interactions.

Fourth, we hypothesized that the warning message would negatively impact tourists' implicit attitudes (H3b). The t-test confirmed a significant difference in D score means between the treatment groups, with $M_{\text{no-warning}} = -0.03$ ($SD = 0.64$) and $M_{\text{warning}} = -0.35$ ($SD = 0.61$). The test yielded a t-value of $t(1048) = 8.1$, $p < 0.001$, with a medium effect size ($d = 0.5$). These results support hypothesis H3b, indicating that exposure to the warning message led to more negative implicit attitudes toward close wildlife interactions.

Lastly, we tested whether the impact of warning messages on tourists' attitudes would be more pronounced among individuals with higher levels of concern for animal welfare, as measured by the Animal Attitude Scale (AAS). Given that the warning messages had minimal to no direct effect on AAS scores (see Appendix E), we performed a median split on the AAS scores to classify participants into high- and low-AAS groups. Two-tailed t-tests showed that the warning messages significantly affected D scores in both groups (see Table 13). However, the effect sizes were similar across the subgroups ($d_{\text{high AAS}} = 0.514$ and $d_{\text{low AAS}} = 0.473$), suggesting that while individuals with higher concern for animal welfare exhibit generally more negative attitudes toward close wildlife interactions, the priming effect of the warning message influences both high- and low-AAS groups to a comparable degree.

Table 13. T-Tests and effect sizes for AAS subgroups on D score outcomes related to warning messages.

| Subgroup | Warning message | n | D score | t | Cohen's <i>d</i> | 95% CI |
|----------|-----------------|-----|-----------------|----------|------------------|---------------|
| high AAS | No | 241 | -0.0938 (0.636) | | | |
| | Yes | 285 | -0.4173 (0.624) | 5.872*** | 0.514 | 0.339 – 0.688 |
| low AAS | No | 270 | 0.0197 (0.648) | | | |
| | Yes | 275 | -0.2744 (0.594) | 5.524*** | 0.473 | 0.303 – 0.643 |

Note. SD in parentheses; *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Consistent with the findings for implicit attitudes, warning messages also had a significant impact on semantic differential scores across both subgroups (see Table 14). However, the effect size was notably larger for participants with higher concern for animal welfare ($d_{\text{high AAS}} = 0.555$) compared to those with lower concern ($d_{\text{low AAS}} = 0.269$). This suggests that while both groups exhibited more negative explicit attitudes

following exposure to the warning message, individuals with stronger pre-existing concerns for animal welfare were more affected by the priming effect.

Table 14. T-Tests and effect sizes for AAS subgroups on semantic differential outcomes related to warning messages.

| Subgroup | Warning message | n | Sem. Diff. | t | Cohen's <i>d</i> | 95% CI |
|----------|-----------------|-----|-----------------|----------|------------------|---------------|
| high AAS | No | 241 | -0.3120 (1.991) | | | |
| | Yes | 285 | -1.3192 (1.650) | 6.346*** | 0.555 | 0.380 – 0.730 |
| low AAS | No | 270 | 0.0659 (1.601) | | | |
| | Yes | 275 | -0.3578 (1.545) | 3.144*** | 0.269 | 0.101 – 0.438 |

Note. SD in parentheses; *** p < 0.001; ** p < 0.01; * p < 0.05.

While the thermometer scores of participants with lower levels of concern for animal welfare were not significantly affected by the warning message, those in the high AAS subgroup exhibited significantly higher thermometer scores in the absence of a warning message (see Table 15). Given the confidence intervals of the Cohen's *d* scores, the effect sizes of the warning message are significantly different. However, the non-significant results for D-scores and semantic differentials lead to the rejection of H4.

Table 15. T-Tests and effect sizes for AAS subgroups on thermometer outcomes related to warning messages.

| Subgroup | Warning message | n | Therm. | t | Cohen's <i>d</i> | 95% CI |
|----------|-----------------|-----|-------------------|----------|------------------|----------------|
| high AAS | No | 241 | 36.90 (33.188) | | | |
| | Yes | 285 | 22.99 (27.016) | 5.299*** | 0.464 | 0.290 – 0.637 |
| low AAS | No | 270 | 43.97 (32.076) | | | |
| | Yes | 275 | 40.32 (29.636) | 1.380 | 0.118 | -0.050 – 0.286 |

Note. SD in parentheses; *** p < 0.001; ** p < 0.01; * p < 0.05.

2.5 Discussion and implications

2.5.1 Discussion

Theoretically, this study highlights discrepancies between implicit and explicit attitudes in tourists. While not new in implicit attitude research, comparing these measures offers a novel

contribution to animal welfare and tourism studies, emphasizing the complexity of attitudes toward captive animals.

Our findings show that tourists are overall neutral towards close animal interactions in both implicit and explicit attitudes, despite large variances between respondents and genders. These findings contrast with earlier research (e.g., Shani, 2009, 2012; Moorhouse et al., 2016), which reported generally positive explicit attitudes toward wildlife interactions. This discrepancy may stem from sample differences, as Moorhouse et al. (2016) focused on previous visitors to animal attractions, whereas our study targeted all international travelers regardless of previous visits. This suggests that interest in wildlife interactions varies widely, and not all tourists are inherently drawn to these experiences.

After an animal welfare-framed warning message, both explicit and implicit attitude measures showed significant negative corrections, especially in female respondents and those with high concern for animal welfare, ranging from low (SC-IAT and Thermometer) to medium (SC-IAT and Semantic Differential). Importantly, corrections were more pronounced for implicit attitudes than for explicit attitudes, suggesting changes that go beyond social desirability.

These findings challenge the assumption that implicit reactions remain stable over time. Some scholars argue that implicit and explicit attitudes represent distinct but related constructs (Karpinski & Hilton, 2001; Nosek & Smyth, 2007), while others suggest that inconsistencies may stem from methodological limitations in capturing between-person variability (Schimmack, 2019; Dang et al., 2020). Alternatively, Karpinski and Hilton (2001) propose that IAT results can be shaped by environmental factors, such as situational context or priming. This aligns with our findings, as the warning message influenced implicit attitudes, reinforcing Eckhardt et al.'s (2012) argument that even implicit attitudes are susceptible to environmental and cultural influences.

The findings encourage tourism scholars to integrate implicit measures alongside traditional surveys to better explore dual-process models, including automatic and controlled attitude formation toward zoos and sustainable tourism, to reveal potential internal conflicts, unconscious biases, or social desirability effects that might otherwise go unnoticed. In contrast, if findings show no differences between implicit and explicit attitudes, respondents report opinion that align with their unconscious, automatic responses, which can be beneficial for higher validity of self-reports, simpler interpretation, and consistent attitude-behavior link.

Practically, this study demonstrates that pre-visit warnings about negative welfare impacts—similar to those used by animal-welfare organizations—effectively reduce both explicit and implicit favorable attitudes. Importantly, these messages influence more than just socially

desirable responses; they can shift underlying attitudes previously considered resistant to change. If implicit attitudes shape behavioral intentions, educating tourists becomes a powerful tool to deter visits to harmful wildlife attractions—offering valuable insights for conservation groups, tourism operators, and policymakers seeking to promote ethical wildlife interactions. This should be encouraging for animal welfare advocates and pro-environmental tourism businesses, given that empowering tourists to make informed choices could create economic incentives for attractions to improve welfare standards (Moorhouse et al., 2017).

These findings support Fennell's (2023) call to integrate animal welfare labels into tourism, using research-based indicators such as conservation status or tourism impact. Displaying warnings at attractions, on websites, and in promotional materials—akin to consumer product labels—could encourage ethical decision-making beyond social desirability pressures.

2.5.2 Limitations and Future Research

As a direction for future research, this study's design limited the exploration of additional covariates, as participants encountered the warning message before completing the survey. A more complex approach could treat implicit and explicit attitudes as separate dependent variables, incorporating the warning condition alongside relevant covariates to assess their impact. A pre-post design measuring implicit attitudes before and after the intervention could also help track attitude shifts and identify key personal characteristics influencing responses to warnings.

Additionally, while respondents specified their gender—including non-binary options—we did not collect data on sexual orientation, constructs of masculinity and femininity (e.g., Herzog et al., 1991; Bem, 1981), or intersectionality, which may strongly correlate with attitudes toward close wildlife interactions.

Moreover, while this study highlighted key differences between explicit and implicit attitudes in understanding tourist motivation, it did not assess whether these attitudes translate into actual behavior change. Investigating this would be particularly valuable, especially at the 'point of sale.' While early studies suggest implicit measures predict behavior (Karpinski & Hilton, 2001), future research should examine the effectiveness of warning messages in real-world settings, such as online ticket shops or near animal attractions. Exploring the role of animal welfare literacy in shaping tourist choices, as proposed by Fennell & de Grosbois (2024), could further deepen insights.

Finally, it is important to acknowledge the general limitations of IAT and other implicit measurement techniques (Brownstein et al., 2020), which can impact interpretation and reliability, underscoring the need for caution when drawing conclusions based solely on implicit attitude assessments.

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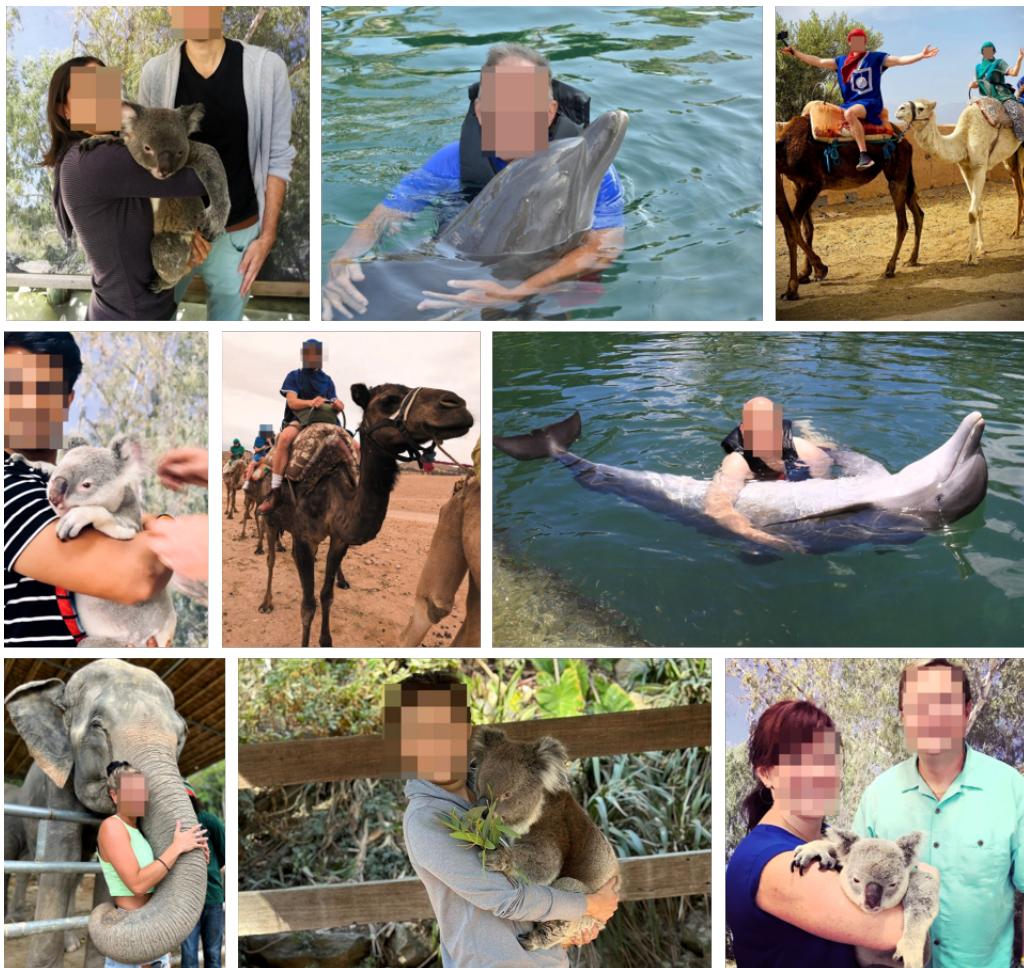
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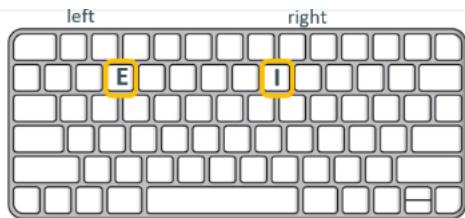
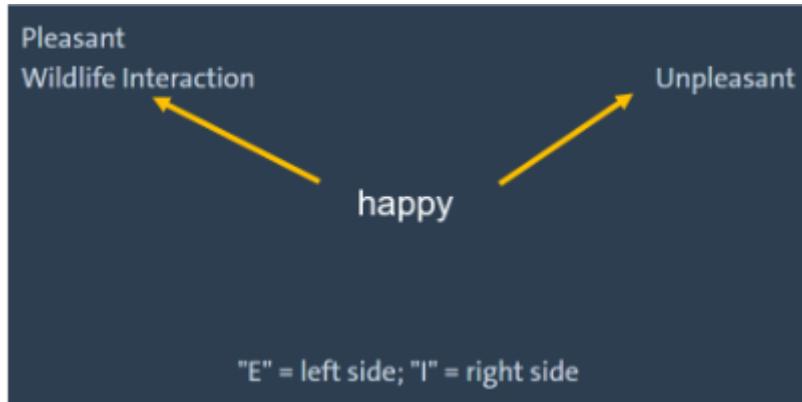
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Appendix Paper 2

Appendix A. Image stimuli used



Appendix B. IAT instructions and design

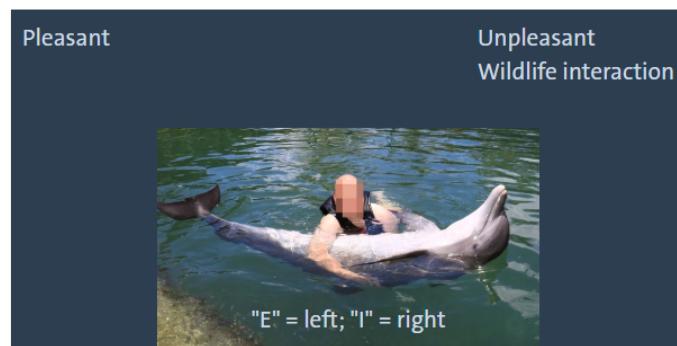


* **You know the game:** Please assign the words (Categories "Pleasant"/"Unpleasant") or images (Category "Wildlife Interaction") to the correct side:

- Left = "Pleasant"
- Right = "Unpleasant" OR "Wildlife Experience"

Press "E" to assign the word or image to the **left side**. Press "I" to assign the word or image to the **right side**.

Start the game by pressing the "E" button.



Note. Image depicts IAT in round 4, hence, instructions were summarized here, whereby they were explained in full detail in rounds 1 and 2.

Appendix C. Animal attitude scale

The updated 10-item AAS consists of the following items (7-point Likert scale):

1. It is morally wrong to hunt wild animals just for sport.
2. I do not think that there is anything wrong with using animals in medical research. **
3. I think it is perfectly acceptable for cattle and hogs to be raised for human consumption. **
4. Basically, humans have the right to use animals as we see fit. **
5. The slaughter of whales and dolphins should be immediately stopped even if it means some people will be put out of work.
6. I sometimes get upset when I see wild animals in cages at zoos.
7. Breeding animals for their skins (leather) a legitimate use of animals. **
8. Some aspects of biology can only be learned through dissecting preserved animals such as cats. **
9. It is unethical to breed purebred dogs for pets when millions of dogs are killed⁴ in animal shelters each year.
10. The use of animals such as rabbits for testing the safety of cosmetics and household products is unnecessary and should be stopped.

** = reverse scored

⁴ Was changed to „when millions of dogs are sent to animal shelter” to match the European standards.

Appendix D. Questionnaire

Note: For practical reasons, the SC-IAT was excluded from this list – please see appendix B for overview over SC-IAT design.

Hello and Welcome!

Thank you for your interest and participation in our study on the perception of animals in tourism. This online study consists of two parts: First, we start with a short game. You will then be asked to complete a questionnaire about your opinion and experiences of animal encounters in tourism.

By participating in this study, you will be making a valuable scientific contribution. In total, the study should take about 10 minutes. Your answers will of course be treated confidentially, so please answer as honestly as possible.

Important: It is necessary to use a desktop computer or laptop with a keyboard for this survey. Please do not use a smartphone or tablet as some elements of the survey might not work!

If you have any questions or technical difficulties, please contact [email address].

Thank you for your time!

Q1. Before you continue: Please note that participation in this study is only possible with a desktop PC or laptop/notebook (no smartphone or tablet)!

Please indicate which hardware you currently use to participate in this study: I am using ...

- Desktop PC or laptop/notebook/MacBook
- Smartphone
- Tablet
- other device

Q2. Before we begin, we would kindly like to know more about you.

Please indicate your age: [dropdown list]

Q3. What gender do you identify with the most?

- Male
- Female
- Non-binary
- diverse/other
- prefer not to say

Q4. What is the highest degree or level of education you have completed or you are currently pursuing?

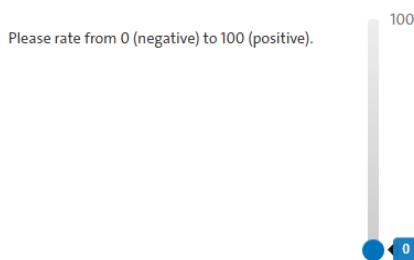
- No Formal Qualifications
- GCSEs or Equivalent
- GCSEs (Higher Grades) or Equivalent
- A-Levels or Equivalent
- Vocational Qualifications (such as NVQs, BTECs, or apprenticeships)
- Undergraduate Degree (Bachelor's Degree or Equivalent)
- Postgraduate Degree (Master's Degree or Equivalent)
- Doctorate/Ph.D. or equivalent and higher
- prefer not to say

Q5. How many times a year do you usually travel internationally, i.e. to countries outside the UK [adapted to country]?

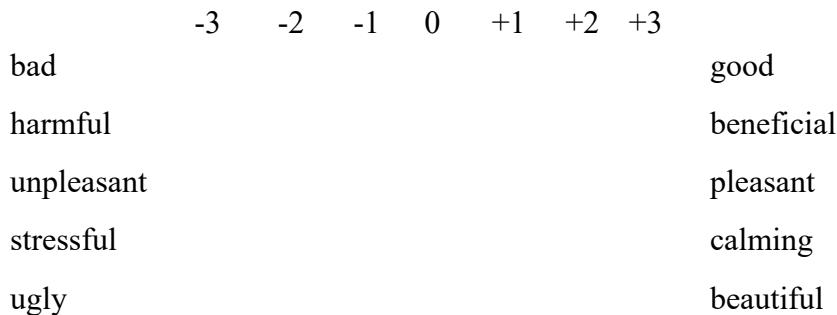
- Less than once per year / never
- 1 to 2 times per year
- 3 to 4 times per year
- more than 4 times per year

[IAT instructions, 4 rounds of SC-IAT]

Q6. Now we would like to know your opinion on animal experiences. Using the following scale from 0 to 100, please indicate your personal attitude toward such animal experiences where tourists can pay to closely interact with animals that do not live in the wild (but for example in zoos, caged parks, etc.). Think of an imaginary thermometer when answering. The warmer or more positive your attitudes towards such animal experiences are, the higher the number you should select. The cooler or less positive your attitudes towards such animal experiences are, the lower the number should be. If you feel neither a positive nor a negative attitude toward such experiences, rate this at 50.



Q7. Please describe how you feel about such animal interactions based on these adjective pairs. If you are indifferent between both adjectives, rate 0.



Q8. Listed below is a series of statements regarding the use of animals. Please indicate the extent to which you agree or disagree with the statement. [Strongly disagree to Strongly agree]

1. It is morally wrong to hunt wild animals just for sport.
2. I do not think that there is anything wrong with using animals in medical research.
3. I think it is perfectly acceptable for cattle and hogs to be raised for human consumption.
4. Basically, humans have the right to use animals as we see fit.
5. The slaughter of whales and dolphins should be immediately stopped even if it means some people will be put out of work.
6. I sometimes get upset when I see wild animals in cages at zoos.
7. Breeding animals for their skins is a legitimate use of animals.
8. Some aspects of biology can only be learned through dissecting preserved animals such as cats.
9. It is unethical to breed purebred dogs for pets when millions of dogs are sent to animal shelters each year.
10. The use of animals such as rabbits for testing the safety of cosmetics and household products is unnecessary and should be stopped.

Q9. Please indicate how strongly you agree with the following statements: [Strongly disagree to Strongly agree]

- For the pleasure of my friends/relatives/children, it's alright to participate in less animal welfare-friendly behaviors sometimes.
- Considering the often much worse conditions for many animals globally, it's hardly a sin for us to visit less animal-friendly zoos every now and then on vacation.
- People cannot be blamed for occasionally doing harmful behaviors on vacation if the circumstances pressure them to do so.
- In contexts where all tourists engage in harmful behaviors, we can't be blamed for doing it too.
- Visiting questionable zoos only sometimes on vacation causes no big harm in the grand scheme of things.

- Wearing animal fur is okay; anyhow, animals are not human beings.
- If I visit less animal welfare-friendly attractions, it's probably because the government is not doing enough against it.

This is the end of the survey. We would like to extend our heartfelt gratitude for taking the time to complete our survey. Your valuable insights and feedback are instrumental in helping us better understand the experiences of tourists. Your responses will be kept confidential and used solely for research purposes. We appreciate your contribution.

If you have any questions or would like to learn more about the outcomes of this survey, please feel free to reach out to us at [email address].

Thank you once again for your participation!

Appendix E. Cohen's *d* results

Cohen's *d* for implicit and explicit attitude changes

| Variable | Cohen's <i>d</i> | | |
|-------------|------------------|--------|--------|
| | Overall | Female | Male |
| D score | -0.499 | -0.561 | -0.400 |
| Thermometer | -0.295 | -0.29 | -0.327 |
| Sem. Diff. | -0.424 | -0.474 | -0.355 |
| AAS | 0.063 | 0.081 | 0.032 |

Note. Cohen's *d* for group comparisons between (sub-)groups (No Warning vs. Warning).

3 P3. #BoycottMurree Campaign on Twitter: Monitoring Public Response to Negative Destination Events During A Crisis

Authors:

Adnan Muhammad Shah, Nadja Schweiggart

Abstract

Research on how the public responds and attributes their experiences to negative destination events on social media during a crisis is limited. This study fills the research gap by analyzing public response on social media to highly visible immoral destination events and service failures. A chain of negative events took place when a heavy snowstorm hit a popular tourism destination (i.e., Murree); these events were extensively publicized on Twitter, and is used as a case. Applying text mining as a combination of topic modeling and sentiment analysis to 89,897 tweets in the dataset, the study analyzes temporal and topical dynamics of public discussion to investigate the useful insights of such data at each disaster stage based on the extended Fink's four-stages of crisis and disaster model. The study shows that the public response on twitter as a number of tweets is moderated by the series of negative events. Results reveal that the majority of tweets are posted in the chronic phase. The most popular tweeted themes are related to tourists' switching intentions – and voicing, portraying negative image of Murree as a tourism destination. Further, anger has been the most dominating emotion, following fear, sadness, and joy during the crisis life cycle. Moreover, the most negative emotions expressed in Tweets relate to topics: local and international sentiments about the incidents followed by the public emotions toward crisis and negative destination image. The findings offer practical implications in tourism, hospitality, and crisis management domains having the potential for future research, which will truly offer value addition for potential researchers.

Keywords: Negative events, Tourism and Hospitality, Social media, Public sentiment, Crisis management

Citation:

Shah, A. M., & Schweiggart, N. (2023). #BoycottMurree campaign on twitter: Monitoring public response to the negative destination events during a crisis. *International Journal of Disaster Risk Reduction*, 92, 103734.

3.1 Introduction

The tourism industry has been highly vulnerable to negative destination events such as unethical incidents, service failures, and failure to protect consumer rights (Breitsohl & Garrod, 2016; Su et al., 2019); as a result, these incidents can severely impact the operations of the tourism destination (Xie et al., 2022; Su et al., 2022). The pervasiveness of social media helps spread news about such issues quickly, which can have a detrimental impact on a tourism destination in the short and long term (Yousaf et al., 2021). SahaYap (2014), for example, reported that due to the major political turmoil in 2010, the tourism business in Thailand suffered a loss of more than \$300 million. Further, the number of tourists visiting Thailand had decreased by a little over 10% due to the political instability and the 2014 military take over. Moreover, in the months following the disaster of Flight MH17 crashed in July 2014, bookings for flights on Malaysia Airlines decreased by 33%. The ongoing effects of Flight MH370's mysterious disappearance earlier that year resulted in a US\$94.4 million loss for the corporation from April to June. Experts were not sure if the airline could recover financially without undertaking major structural adjustments, such as job cuts of up to 25% (BBC News, 2014). In 2016, an incident in which a female tourist was sexually assaulted in Beijing by a hotel employee, the event sparked a heated debate on China's most popular social media platforms. The attack was the most-talked-about service failure and prompted widespread criticism of service providers. The public sentiments persisted for a number of weeks, causing irreparable damage to the corporate's image and reputation (Su et al., 2019). In addition, a series of deadly bombings in 2019, the COVID-19 epidemic, and an economic crisis severely impacted Sri Lanka's tourism industry and foreign currency shortage (BBC News, 2022). These negative events substantially influence revenue generated by the tourists' activities (Yu et al., 2020). Such crises imply that negative events may have a substantial effect on destination growth and call for enhanced attention to emergency response management (Javornik et al., 2020). Due to the intangible and transient nature of tourism and its consumers, tourists who become aware of service failures at a destination run the risk of damaging the reputations of local businesses and lowering the overall image of the destination (Breitsohl & Garrod, 2016).

Earlier research on the effects of natural disasters on tourism demonstrated that the destination tourism business might be considerably influenced by disasters shortly following crisis events (Jin et al., 2019). In marketing research, the term “negative events” is frequently referred to as a kind of crisis event with “a significant and widespread negative effect” generated by “the products or services of the firm, the entire firm, or individual personnel in the organization” (Su et al., 2022), this research area has received considerable researcher attention in recent years

(Su et al., 2019; Su et al., 2022; Zenker et al., 2019). Since the tourism business could be vulnerable to global ecological changes (Jin et al., 2019), the crisis event is a broader concept and is triggered by external factors (e.g. health crisis, terrorism or natural disasters), which are beyond the control of the corporation and hence distinguished by the negative events that the corporation may be able to control (Seabra et al., 2020; Kim et al., 2018; Kim & Pomirleanu, 2021). According to attribution theory (Weiner, 1986), people experience a spectrum of emotions when they undergo an unpleasant experience due to a negative event; they are more prone to attribute it to internal causes and become highly involved (Kang et al., 2021). The extent to which attribution can be assigned varies greatly depending on whether the crisis was caused by a natural disaster, an accident, or something that could have been avoided as a negative event (avoidable incident). If an “avoidable incident” occurred and/or if a corporate had a similar incident in the past, there is a greater likelihood that blame will be assigned and negative feelings will result in a decline in reputation (Su et al., 2019). Recurring incidents give the impression that the corporation is unable or unwilling to handle such issues and shows little regard for its customer interests (Yu et al., 2022). Therefore, it is reasonable to expect that during negative events, the public around the crisis incident is more likely to feel intense emotions that would prompt them to participate in social media discussions.

The use of social media during a crisis is becoming an emerging researched topic in crisis informatics and public relations (Reuter & Kaufhold, 2018). People with a negative experience at a destination are likely to spend more cognitive efforts expressing the destination's negative characteristics and complain about it on social media (Yu et al., 2022). Social media platforms have made it easier to connect with the public and get their attention. Still, it may also be put to the task of analyzing public sentiment and opinion. These digital channels are increasingly being used to launch various forms of digital activism related to tourism (Yousaf et al., 2021). This is very important for modern tourism enterprises and destinations because when a negative event occurs at a destination, tourists may have the impression that the location does not live up to the standards they have set for the type of experience they hope to have there. This may cause the public to lose faith in the destination and express negative reaction toward it on social media (Su et al., 2022). Emotions are critical because they grab the audience's attention with exquisite details. People tend to talk about unpleasant experiences that have a strong emotional impact (Servidio & Ruffolo, 2016). Previous research emphasizes that the public is open to sharing their experiences at the destination with others (Breitsohl & Garrod, 2016). As a result, the necessity for practical analysis of public opinion and perception needs rapid analysis. Social network analysis provides this potential due to the extensive application of these platforms and

fast data acquisition. Recent research has shown that big social media data mining can reveal evidence about how the public reacts to various types of crisis events, such as health emergencies (Shah et al., 2021), hospitality incidents (Su et al., 2019), viaduct collapse disasters (Gu et al., 2021), flood emergency (Han & Wang, 2019), storm disaster (Kim et al., 2018; Neppalli et al., 2017), and earthquake emergency (Autelitano et al., 2019). Despite the negative events at destinations appearing to be on rise, relatively limited research has been conducted on the topic, and digitally mediated public engagement and perception during crisis remains understudied.

Public crisis responses on social media affect both travelers' as well as governments' decision-making. Studies showed that citizens social media engagement and crisis informatics may help in understanding public response to crisis events (Rachunok et al., 2022) and citizens' decision making (Rather et al., 2021) by increasing awareness and compliance behaviors through social learning (Zhang et al., 2022). However, while different government and non-government agencies have started using social media, the use is yet very limited, mainly using social media for information dissemination and spreading awareness among public (Li et al., 2020) and failing to gauge or listen to public (Saroj & Pal., 2020). Moreover, governments and other authorities as well as destination managers can retrieve valuable information from the collective intelligence of stakeholders via social media and respond accordingly (Sarjo & Pal., 2020; Houston et al., 2015; Wukich, 2016). Indeed, a number of local governments have self-reported to use social media in crisis response evaluations (Graham et al., 2015) and the extent of social media use has been shown to be positively associated with local city officials' ability to control a crisis situation (Graham et al., 2015).

In light of the above discussion, the core purpose of this paper was to investigate the public perceptions (important topics) and their sentiments on social media platforms (i.e., Twitter) toward negative destination events during a crisis in a developing country context (Pakistan). Our research contributes to this body of knowledge by proving that big social media data mining provides timely insights into public views and attitudes toward crisis events, which could impact crisis management strategies that support post-disaster destination recovery. This paper aims to answer the below research questions.

RQ1. What are the core topics of public discussion on Twitter and their temporal dynamics toward destination during the crisis?

RQ2. Do the public sentiments toward destination changing in different crisis stages?

RQ3. How can relevant stakeholders use these findings to formulate crisis management strategies, policies, and plans in the tourism industry?

To address these research questions, first, we collected data from Twitter (which includes trends/tweets, retweets, and replies) and analyzed the dynamics of public reaction to negative destination events (i.e., Murree) during the crisis. The text mining technique was used to detect relevant topics debated in public discussion during the crisis. Further, the temporal dynamics of extracted topics in the online discussions were analyzed. Next, the topic-wise discrete sentiment analysis was performed to compute the discrete negative and positive sentiments in public discussion. Since the tourism activities could be affected on various levels by a variety and magnitude of crisis events, the temporal dynamics of the emotions over the crisis life cycle is addressed using extended Fink's four-stages of crisis and disaster model. Based on the attribution theory and extended Fink's four-stages of crisis and disaster framework, this study interprets findings from the perspective of reputational damage to the destination, which is practically meaningful.

3.2 Literature Review

3.2.1 Crises, negative events and tourism

In the tourism domain, crisis events are defined as incidents that undermine the morale of travelers visiting the destination, disrupting the tourism industry's normal activities (Jin et al., 2019). Crisis events such as natural disasters (floods and earthquakes), community diseases, recession, political instability, and terrorism have damaging affect in the tourism industry (Jin et al., 2019; Kim & Pomirleanu, 2021; Zenker & Kock, 2020). Crises of such nature not only ruin the local attractions and resources that rely on tourism for revenue but also put tourists in danger and spark concerns about potential travel restrictions (Baum & Hai, 2020). Due to the topic's growing importance, tourism researchers have committed considerable effort to analyzing a number of crises that can severely affect the image of a destination. Regarding crisis events in the tourism domain, these studies have mostly focused on externally induced crisis events, together with those whose core causes are natural, for instance, flood emergencies (Xan & Wang, 2019), snow storms (Yousaf et al., 2021), disease outbreaks (Rather, 2021), and those that are fundamentally human-oriented, such as inflation (Okumus et al., 2005), refugee crisis (Zenker et al., 2019), and terrorist attacks (Saha & Yap, 2014). As a result, tourists' reactions to internally executed crisis events caused by administrative or institutional flaws have been generally ignored.

Crisis events may vary in nature, magnitude, duration, time, and location. Depending on the nature, they may have short-term or long-term effects on the tourism industry (Jin et al., 2019). According to Faulkner (2001), differentiation is important because the effects of the crisis that come from external forces are likely to be very different from those that are self-induced and that come from internal forces. Both external and internal crises are likely to damage a destination's image. Still, tourists may be more likely to blame the destination itself in the case of an internal crisis instead of blaming unplanned, uncontrollable events (Jin et al., 2019). If an event constitutes an internal crisis, the destination and its constituent entities are likely to bear culpability, which increases the likelihood that tourists may engage in harmful actions, such as abandoning the destination and telling their friends about bad experiences there (Su et al. 2019). Such examples prove that negative events can affect destination growth and call for better crisis management (Su et al., 2022).

The current research also focuses on the internally induced crisis, what we refer to as the negative event at the destination. The “negative event” describes a crisis that stakeholders believe was internally executed (i.e., the problem was caused by one or more organizations associated with the destination itself) and immoral in nature. Although negative events are frequently believed as a kind of crisis event, but the notion of a crisis event is extensive and fall under the category of external elements (e.g., health emergency, natural disaster, and terrorist attacks) (Seabra et al., 2020; Kim et al., 2018; Shah et al., 2021; Gu et al., 2021; Han & Wang, 2019; Autelitano et al., 2019), these events are not within the control of the marketer and hence distinguishable from negative events, which marketers might be able to influence. Consequently, environmental degradation, congestion, poor customer service, arbitrary pricing rises, etc., may affect tourism differently (Hu et al., 2020). Previous findings from the literature (Breitstohl & Garrod, 2016; Su et al., 2022; Jin et al., 2019) also revealed that negative events in tourism destinations are likely to receive wide-ranging negative media coverage, making them known to potential tourists globally. Therefore, destinations must come up with marketing and service plans to alleviate the concerns of their target audiences.

The tourism business has suffered severely in crisis events as a result of nearly halting all leisure activities. For example, Su et al. (2022) showed that a negative event has a stronger destructive influence on tourist betrayal and destination boycotts. Grégoire et al. 2010) et al. reported that negative incidents cause travelers to see tourism destination behaviors as outrageous. The literature in the marketing domain suggests that different kinds of human-oriented negative events may have distinctive effects. Recent research has found the differential effects of events on consumer response (Breitstohl & Garrod, 2016; Kübler et al., 2020). Public sentiments,

experiences, and knowledge relating to the destination reflect the destination image (Kock et al., 2016). When an unpleasant event takes place in a tourist destination, it may affect public perceptions of that location. With the widespread use of the internet and social media, tourists promote their animosity toward their destination through electronic word-of-mouth (Yu et al., 2020). Despite the wide-ranging repercussions of such events, little research has been conducted on the effects of negative events, predominantly in the tourism domain.

3.2.2 Social media engagement during crises

The advent of social networks has been a game-changer for the tourism industry (Altuntas et al., 2022) since it gives customers a unified voice in supporting or criticizing an organization's actions as a whole (Rydén et al., 2020). It has empowered tourists to become co-designers, co-producers, co-marketers and co-consumers to explain tourism experiences (Sigala et al., 2012). As shown by scholars, tourism consumer behavior has changed considerably due to the use of social media (Sotiriadis, 2017). Tourists use social media in different trip stages: In the pre-trip stage (to find information in the planning process to minimize faulty decisions (Chung & Koo, 2015), in the during-trip stage (Wong et al., 2020), as well as in the post-trip stage to report about their experiences (Minazzi & Mauri, 2015). Travelers post on social media about different categories of tourism experiences (Yu et al., 2021). Their textual contents exhibit a high level of sentiments and emotional content in their posts and are influenced by a variety of service experience factors (Kar et al., 2021; Kumar et al., 2021). In case of negative events, information routes are constructed by exchanging information in several directions, including those affected as victims, the general public, the service provider, the media (both traditional and social), and other stakeholders. As a result, the prevalence of "public communication" frequently predominates, and standard corporate response framing strategies face new obstacles (Su et al., 2019).

In today's world, social media can change the public perception and their interpretation of crises (Yousaf et al., 2021). Negative events are, unfortunately, inevitable in the hospitality and tourism industry (Breitsohl & Garrod, 2016). Due to the growth of mobile devices, offended customers can rapidly broadcast their complaints on social networks for the public to see. Such negative events draw massive public attention and receive widespread media coverage on social media, endangering the destination and service providers' reputation (Rydén et al., 2020). Internet criticism damages a service provider's credibility and reputation and is likely to draw attention to its operations and management methods and spread unsubstantiated rumors that are

difficult to dispel (Su et al., 2019). It has the potential to start online rumour mills full of negative feedback (Luo & Zhai, 2017).

In tourism, research on how social media can be used to deal with crises, discussions, and promotions is still in its early stages but overgrowing (Su et al., 2019). The protest in Hong Kong could be a case study on how people's conversations on Weibo regarding Occupy Central shifted to a tourism boycott (Luo & Zhai, 2017). Using crisis informatics, Reuter & Kaufhold (2018) used Twitter data to raise public awareness about disaster preparedness. Xie et al. (2022) analyzed public opinions on Thailand from Chinese online platforms to examine how crisis frames influence the negative travel intentions. Using Chinese microblogging Weibo data, Su et al. (2019) examined the dynamics of public discussion to examine whether such information is valuable for service providers in crisis. Kim et al. (2018) used text analytics to examine information diffusion through news, weather services, governmental institutions, and the general public when Storm Cindy hit the United States in 2017. Becken et al. (2022) collected Twitter data to monitor public discussion on social media about aviation and the climate crisis. Han & Wang (2019) mined and analyzed public sentiment on social media during a 2018 flood disaster in China. In sum, social media has become a critical tool in crisis communication.

3.2.3 Analytical approaches for textual data

More and more scholars are turning to text mining to gain insight from large amounts of unstructured text data. Text mining is a tool that researchers use to analyze both quantitative and qualitative data and to reveal crucial information. In order to convey the latest trends, several social media platforms mine large amounts of unstructured data to get useful insights. Researchers used different analytical approaches to analyze the social media data.

Topic modeling: Crisis management organizations increasingly turn to analytical technologies to detect events of interest and collect data for subsequent decision-making. One of these events of interest is the topic. Discussions and narratives about emergency events often include several themes or topics, allowing the public to comprehensively figure out the event from different viewpoints. A few researchers have recently employed topic modeling using textual data to extract crisis/disaster context-related topics (Su et al., 2019; Kim et al., 2018; Xu, 2020; Aggarwal & Gour, 2020). However, studies related to analyzing social media data on negative events in the tourism context are very limited.

Sentiment analysis: Sentiment analysis has been used in different domains, including healthcare, disaster, and tourism, etc. (Han & Wang, 2019; Xu, 2020; Aggarwal & Gour, 2020;

Shah et al., 2021). Sentiment analysis examines people's sentiments, perceptions, and feelings in a specific context (Aggarwal & Gour, 2020).

Since public sentiments and attitudes shift across the different stages of a disaster, certain sentiments may be more dominating in different disaster stages (Fink, 1986). This study used extended Fink's four-stages of crisis and disaster model and the "Emotional Stages of a Disaster" model to figure out how people feel at different stages of a disaster and how to cope with it (Fink, 1986, DeWolfe, 2000). According to Fink and "Emotional Stages of a Disaster model," a crisis development and management can be divided into four stages along with the associated emotions: prodromal, acute, chronic, and termination phases:

- 1) During the prodromal phase, when a disaster with potentially catastrophic repercussions is imminent, the general populace is keen to acquire knowledge to lessen uncertainty (Reynolds & Seeger, 2005). People are likely to experience varying degrees of fear and discomfort based on whether or not they consider having control over their ability to protect themselves and the people they care about. Consequently, information about readiness and preventative measures may mobilize audiences,
- 2) during the acute phase, when the precipitating event directly endangers lives and assets, instant updates and insider knowledge may be given more consideration (Austin et al., 2012). The public emotional response could range from relief to panic, depending on the amounts of personal loss and community ruin they experienced as a result of the disaster,
- 3) in the chronic stage, the public may be keen to search for factual and updated information from reliable sources, as rumors have spread extensively and swiftly on social media (Gupta et al., 2022). In this stage, emotional responses continue to be influenced by the magnitude of personal losses and collective harms. The public may engage in charity and heroic deeds for emotional support and a sense of optimism,
- and 4) following the termination phase when the crisis has ended, it may be desirable to have an open dialogue about recovery efforts, problem-solving, and lessons gained from the crisis (Zhao et al., 2018). In this stage, affectees will have psychological resiliency along with rehabilitation (DeWolfe, 2000).

In conclusion, as public attitudes and concerns vary over the crisis life cycle, particular themes may be more attractive at various stages of a crisis, reflecting the dynamics of public interest, sentiment, and opinion over time. Thus, involving multiple stakeholders at different stages of a

crisis is critical for crisis management. Better crisis planning, prediction, and resource allocation can save tourism destination economies from economic losses.

3.3 Material and methods

3.3.1 Study context

On January 07, 2022, a snowstorm recorded more than 4 feet of snow hitting a tourism destination (Murree) in Pakistan. As a result, 23 tourists, including 10 children, froze to death due to hypothermia as thousands of tourists were trapped inside their vehicles. Referring to rescue sources, the victims were unable to make it to the hospital in time, which ultimately led to their deaths. Many tourists were driven to stay a couple of nights in their vehicles due to exorbitant hotel prices; they could not afford the expensive lodgings. Local media interviewed the tourists who told “cold-hearted” hospitality service providers showed no mercy, even to children and infants. Basic commodity prices had risen because of the severe weather in the most-visited mountain resort of Murree. The deteriorating weather at the destination with the highest tourist volume caused costs for even the most fundamental foods to rise. Media reports stated that hotel owners had hiked accommodation rates from 50\$ to 350\$ per night, which had previously been between 30\$ and 50\$ per night (Wion, 2022).

With a rise in smart phones usage, customers can now capture photographs or videos of businesses’ wrongdoings and upload them to the internet, where they quickly go viral. Because of tragedy in Murree which claimed the lives of innocent tourists, the hashtag #BoycottMurree was trending on Twitter, calling for public attention, opinion, and reaction toward service providers who demanded exorbitant prices as inhuman circumstances (Daily Times, 2022). Figure 11 shows the example tweets posted on social media platforms during the life cycle of the Murree crisis.



Figure 11. Example tweets regarding Murree crisis on Twitter.

According to Fink's four-stages of crisis and disaster model, the current study considers January 08 as the prodromal stage of the Murree crisis. The period between January 09 to January 10 was regarded as an acute stage, and the period between January 11 to 12 was considered a chronic stage. When all roads to Murree were cleared and disaster management authorities (DMAs) completed the rescue operation with the help of local administration, the crisis moved to the termination stage starting from January 13 till January 14.

3.3.2 Data collection and pre-processing

To begin with data collection, twitter trends with the hashtag #BoycottMurree including tweets, retweets, and replies were retrieved. The hashtag used was a trending topic on Twitter and sparked a wide range of reactions by the public in a relatively short amount of time. Through tweets scraping using “Python snsccape” and “Beautiful Soup” packages, we collected 94,229 tweets posted between 12:00 p.m. on January 08 and 00:00 a.m. on January 15, 2022. During the 7 days surveyed, the Murree incident was declared a disaster, and DMAs had taken massive measures to control the damage.

Before launching a formal data analysis process, the extracted raw dataset was cleaned through following subsequent pre-processing steps which are in line with those adopted by earlier investigation (Aggarwal & Gour, 2022): First, using langid package (Lui & Baldwin, 2012), non-English tweets were removed from our dataset. In the next step, duplicate, redundant, and incomplete tweets, stop words, numbers, special characters such as @, #, URL's, and extra

white spaces, were also removed from our dataset (Bonzanini, 2015; Singh & Kumari, 2016). Post this step, word tokenization (i.e., splitting a text stream into smaller components known as tokens) was performed using Natural Language Toolkit (NLTK) word.tokenize function, which is another important step in text pre-processing (Bonanzini, 2015). Next, data normalization was achieved with word tokenization, stemming and lemmatization by conversion of tweets to lowercase (Singh & Kumari, 2016). All these pre-processing steps of Twitter data was performed by using packages of NLTK (Bird et al., 2009) embedded in the Python programming setting. The inclusion of bigrams and trigrams was reviewed further in processed dataset. Tokens that occurred less than ten times in the dataset or tweets with fewer than ten tokens were removed. We also created a document-term matrix and processed the data using the term frequency-inverse document frequency (TF-IDF). TF-IDF is a quantitative measure that reflects the significance of a word in a document of a corpus (Rajaraman & Zillman, 2011). The TF-IDF weight is maximized when an individual word has the highest term frequency (TF) in any tweet and a low document frequency (DF) over the entire dataset. Following Erra et al. (2015), the TF-IDF vectorizer method was applied to the Twitter dataset. Table 16 in Section 3.3.3 shows the top keywords along with the associated TF-IDF values. Following the data pre-processing, 89,897 tweets fulfilled the criteria for further analysis. Fig. 2 shows the overall architecture of the current study.

Table 16. Topic modeling results.

| Theme, topics, associated keywords, and TF-IDF value in (x) |
|--|
| Day 1 (Prodromal stage): January 08, 2021 |
| Theme 1: Voicing and portraying negative image of Murree as a tourism destination |
| Topic 1: Public emotions toward negative events |
| Brutal (0.19854), Act (0.19741), Illegal (0.19622), Money (0.19609), Shame (0.19591), Nopity (0.19487), Animal (0.19449), Butcher (0.19411), Looter (0.19389), Culprits (0.19377) |
| Topic 2: Hoteliers attitude toward tourists |
| Blackmailer (0.19341), Insult (0.19323), Quarrel (0.19309), Moron (0.19289), Arrogant (0.19276), Mafias (0.19251), Hell (0.19248), Shameful (0.19198), Behavior (0.19189), Exploit (0.19181) |
| Topic 5: Moral-based negative events |
| Humanity (0.17187), Learn (0.17171), Unsympathetic (0.17142), Laws (0.17109), Moral (0.17098), Islam (0.17076), Lesson (0.17055), Godsake (0.17048), Mercy (0.17039), Ethical (0.17035) |
| Theme 2: Wakeup call from media organizations |
| Topic 3: Leading news channels reporting |

Theme, topics, associated keywords, and TF-IDF value in (x)

Day 1 (Prodromal stage): January 08, 2021

ARYNews (0.18989), Choked (0.18911), Raise (0.18849), DawnNews (0.18811), LamhaNews (0.18721), Voice20 k_cars (0.18703), News18Kashmir (0.18691), Local_media (0.18678), NewsExpress (0.18640), Alerts (0.18615)

Day 2 (Acute stage): January 09, 2021

Theme 3: Conspiracy about the destination

Topic 16: Boycott conspiracy

Awareness (0.10654), Teachlesson (0.10611), BOYCOTT MURREE (0.10567), Unite (0.10512), Donotstop (0.10491), Never Go (0.10456), Boycott (0.10411), Humanity (0.10365), Abandonedmurree (0.10351), Unforgettablelesson (0.10338),

Theme 4: Justification of experiences by tourists

Topic 10: Negative destination image

Slaughter (0.14587), Hotel rents (0.14488), Notaffordable (0.14470), Foodprices (0.14345), Overcharging (0.14301), Hypocrites junction (0.14291), Restaurant owners (0.14275), Naturerevenge (0.14241), Business ethic (0.14108), Car_mechanics (0.14056)

Topic 11: Poor tourism service facilities

Overrated destination (0.14007), Bullshit (0.13981), Nevergo (0.13808), Fuckoff Murree (0.13776), Curse (0.13739), Unforgivable (0.13670), Teachlesson (0.13624), Boycott mafia (0.13456), Shithole destination (0.13411), Blackmailer Hoteliers (0.13371)

Topic 17: Eyewitness report

Wife jewelry (0.10298), Doomsday (0.10271), Heartbreaking (0.10245), Harassment (0.10221), Local gangsters (0.10198), Stuck automobiles (0.10156), Demandedthousands (0.10131), Overpriced (0.10109), Misbehave (0.10067), Money lover (0.10033)

Day 3 (Acute stage): January 10, 2021

Theme 5: Stories from individuals in Murree

Topic 12: Disaster content viral online

Deadbody (0.13011), Videosviral (0.12976), Jungle (0.12913), Carbonmonooxide (0.12859), Tragic death (0.12832), Strandedvehicles (0.12814), Dense jungle (0.12708), Avoidable tragedy (0.12641), Death (0.12578), Touristinflux (0.12234)

Topic 13: Disaster stories

Unforgivable (0.12143), 70,000_forroomrent (0.12076), 500_forboilegg (0.12045), 5000_carchain (0.12009), 500_toilet (0.11931), Tourist_safety (0.11909), Crying (0.11843), Beasts (0.11812), Highfares (0.11786), Trapped_tourists (0.11731)

Day 4 (Chronic stage): January 11, 2021

Theme 6: Punitive desire among tourists and local communities

Topic 14: Local community post disaster attitude

Natural disaster (0.11731), Government (0.11654), Local resident (0.11609), food (0.11543), Open door (0.11509), Family house (0.11487), Mosques (0.11419), Schools (0.11395), Kindhearted (0.11359), Hope (0.11311)

Theme, topics, associated keywords, and TF-IDF value in (x)

Day 1 (Prodromal stage): January 08, 2021

Topic 15: Negligence from tourists

Disobeyed (0.11301), Verbal instructions (0.11256), Police orders (0.11134), Narrow road (0.11056), Abundance (0.10986), Limited hotels (0.10956), Careless people (0.10876), Guilty (0.10812), Stuck (0.10745), Entry points (0.10712)

Theme 7: Call for the administration interpolation

Topic 8: Relief and action from government

Compensation (0.15566), Deceased_families (0.15458), Action (0.15431), Seal_hotels (0.15411), Price_gouging (0.15386), Investigation (0.15375), Administration's_failure (0.15360), Criminality (0.15339), Negligence (0.15233), No_Coordination (0.15187)

Topic 19: Urge for the government intervention

Europe model (0.00654), Mismanagement (0.00638), Response (0.00541), Tourism revolution (0.00508), Slow response (0.00498), Zerotolerance (0.00471), Disaster management (0.00455), Trainings (0.00439), Divining license (0.00423), Machinery (0.00411)

Day 5 (Chronic stage): January 12, 2021

Theme 8: Prevention and disaster control procedures

Topic 6: Emergency response measures

Local administration (0.16908), Rescue (0.16898), Underway (0.16887), Effort (0.16876), Rescue (0.16863), Pakistan Army (0.16841), Army Engineers (0.16829), Hospitals (0.16805), Emergency (0.16791), Rescue vehicle (0.16776)

Topic 7: Post crisis actions

Relief camps (0.16687), Extended (0.16513), Free call (0.16491), Medication (0.16455), Warmfood (0.16309), Clearing snow (0.16256), Rescue (0.16098), Water (0.16053), Pulled out (0.16036), Traffic_flow (0.16011)

Day 6 (Termination stage): January 13, 2021

Theme 9: The mature tourist behavior

Topic 20: Appraisal for emergency response organizations

Local_administration (0.00378), Work_hard (0.00354), Day_night (0.00343), Distribute_flowers (0.00331), Shuttle_service (0.00324), Return_home (0.00309), Control_room (0.00291), Awareness_campaign (0.00265), Pulled_out (0.00243), High_morale (0.00141)

Topic 9: Call for tourism regulations

Policy (0.15003), Fix (0.14991), Hotelrates (0.14857), Regulate (0.14804), Helpline (0.14797), Control (0.14771), Parking (0.14745), Plazas (0.14709), Government (0.14654), District (0.14587)

Day 7 (Termination stage): January 14, 2021

Theme 10: Tourists' switching intentions

Topic 4: Low tourist-destination bond

Theme, topics, associated keywords, and TF-IDF value in (x)

Day 1 (Prodromal stage): January 08, 2021

Sindh (0.17876), Neelumvalley (0.17855), Swat (0.17819), Naltarvalley (0.17790), Desert (0.17688), Alternate destination (0.17652), Ziarat (0.17585), Kashmir (0.17561), MalamJabba (0.17309), Scenic spot (0.17211)

Topic 18: Local and international sentiments

Public call (0.10033), Concrete step (0.00992), StrongNation (0.00934), Saynoto murree (0.00904), Murree death(0.00875), Stopgoing (0.00856), Murree tragedy (0.00831), Boycott lifetime (0.00798), Putin jail (0.00751), Govt action (0.00728)

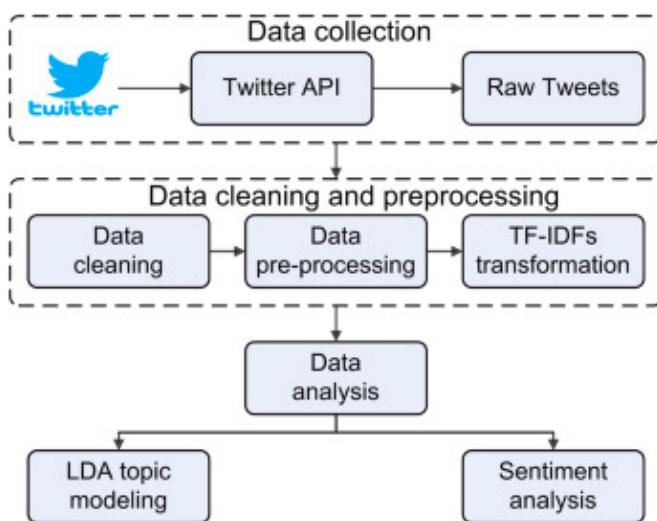


Figure 12. The proposed architecture of the study.

3.3.3 Topic modeling

Topic modeling refers to the process of identifying and mining high-level semantic concepts from an unstructured text in a dataset. The Latent Dirichlet Allocation (LDA) approach is a Bayesian probability model that has three layers and is based on the “document–topic–word” notion introduced by Blei et al. (2003). It is a common method for text clustering from the corpus of vast user-generated big data. The model treats a document as a collection of hidden topics, calculating the association between morphemes and topics in a corpus based on the likelihood of words falling into a topic taxonomy. It is an unsupervised learning method for automatically discovering important factors in the online discussion because of its superior capacity to visualize hidden topics in a target text. LDA is commonly used in social network analysis literature (Rathore et al., 2017; Choi et al., 2020) and text mining in the tourism domain to explore hidden factors that affect tourists perceptions toward destination crisis (Su et al., 2019; Kim et al., 2018; Aggarwal & Gour, 2020; Cao et al., 2022; Kar et al., 2021; Xu, 2020).

However, in contrary to existing destination crisis informatics literature Rachunok et al., 2022) and recent research call for text mining in services management (Kumar et al., 2021), there is scant research regarding application of the topic modeling on internally induced crisis-related textual big data using LDA — as a rigorous data analytics approach for capturing real tourist service experience as context-associated factors.

According to Blei et al. (2003), we fit LDA on the Twitter dataset to learn the optimal topic number. We apply the Python Gensim module to train an LDA model for selecting the optimal topic number (Gensim, 2022). We use the coherence score to define the optimal topic number (Röder et al., 2015), which measures the semantic similarity between high-scoring words in a topic. For example, the co-occurrence connection between words is used to represent words in the form of vectors, and the cosine similarity between word vectors measures semantic similarity. The coherence score is the arithmetic mean of these similarities. It helps tell the difference between topics that are easy for humans to understand and things that are caused by statistical inference.

$$\text{Coherence} = \sum_{i < j} \text{score}(\omega_i, \omega_j)$$

Where the top n most frequent terms in each topic are selected, the individual pairwise scores of each of the top n words $\omega_1, \dots, \omega_n$ in each topic are aggregated. Figure 13 displays the coherence scores of various topic numbers based on the LDA model and the Twitter dataset. It could be observed that when the topic number approaches 20 the coherence score achieves its maximum value of 0.39. Since only statistical measures made the data uninterpretable for humans, we set the topic number for LDA to 20 through a combination of statistical metrics and manual interpretation using Python 3.6.1 and the LDAvis tool (Blei et al., 2003). We set $\lambda=1$ and the number of topics to 20 with their associated keywords. The algorithm for the topic modeling is adopted from Ref. [21]. Next, the topics were labeled on mutual consensus based on their corresponding keywords.

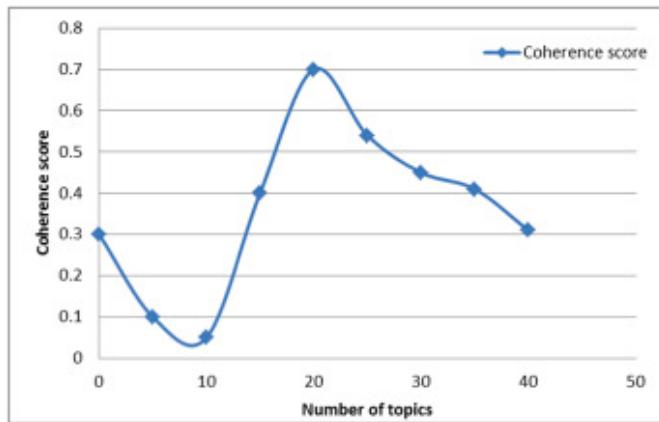


Figure 13. The coherence score of various topic numbers.

We also categorized these topics into several themes to explore them properly. Using LDAvis tool, 20 topics were portrayed as circles in the visualization of the two-dimensional plane (Figure 13). The centers of these overlapping circles are determined by computing the topic distance (Blei et al., 2003). These 20 topics were divided into ten main basic themes using this method. The word cloud of the most frequently occurring words for all 20 topics is shown in Figure 14.



Figure 14. Intertopic distance map. PC: principal component.



Figure 15. Word cloud for all 20 topics with their associated top ten frequent keywords.

3.3.4 Topic-wise sentiment analysis

Individuals express sentiments and emotions every day, but the strength or intensity of those sentiments changes from one situation to the next. Emotional understanding is still largely constrained by the categorical and discrete nature of most language analytic services and theories (i.e., positive, negative, neutral) and emotions (i.e., joyful vs not joyful, depressed vs not depressed, annoyed vs not annoyed). It is possible to get real-valued scores using discrete emotion and sentiment classifiers, but the earlier does not tell us anything about how intense the emotional experience was. Measuring emotional strength along a continuous scale is a comparatively understudied aspect.

The CrystalFeel algorithm, a sentiment analytic tool that has been proven accurate, was used to analyze the underlying emotions of topics. CrystalFeel analyzes emotional content from natural language text using machine learning-based algorithms. CrystalFeel is capable of producing a wide variety of psychologically significant analytic outputs based on its multi-theoretic conceptual grounding in emotion type, dimension, and intensity (CrystalFeel, 2021).

The CrystalFeel algorithm has been used in previous studies to examine the four basic human emotions at various points during a crisis (Shah et al., 2021; Mahdikhani, 2022). Following this, the emotional intensity of the CrystalFeel algorithm (Gupta & Yang, 2018) was used to label the prevalent emotions of fear, anger, sadness, and happiness during the crisis. Using the CrystalFeel algorithm, labels were assigned to the topics according to their emotion score (emotional valence is the polarity of sentiments), and these labels fall into one of three categories, which are as follows: (i) No particular feeling, (ii) If valence-score greater than 0.520 indicates “joy” as an emotional state; (iii) “Anger” if its intensity score outweighs both fear and sadness in terms of intensity. When the valence score falls below 0.480, the emotion is categorized as (1) “anger” only if the anger intensity-score is greater than both the fear and sadness intensity-scores, (2) “fear” only applies if the intensity-score for fear is higher than the intensity-scores for both anger and sadness, and (3) “sadness” if and only if sadness intensity-score is greater than anger and fear (Mahdikhani, 2022). Table 17 depicts the algorithm.

Table 17. Algorithm 1: Emotion score for topic label using CrystalFeel algorithm.

```

1: Input: Top keywords associated with each topic;
2: Output: Labeled topics based on associated emotion score;
3: Process: 4: emotion_category = “no specific emotion”;
5: if (emotion_value > 0.520) then
6: Print “The public emotion toward Murree disaster is:”
7: Print emotion_category = “joy”;
8: else
9: if (emotion_score < 0.480) then

```

```

10: Print “The public emotion toward Murree disaster is:”
11: Print emotion_category = “anger”;
13: if ((fear_score > anger_score) and (fear_score > sadness_score)) then
14: Print “The public emotion toward Murree disaster is:”
15: Print emotion_category = “fear”;
16: else
17: if ((sadness_score > anger_score) and (sadness_score > fear_score)) then
18: Print “The public emotion toward Murree disaster is:”
19: Print emotion_category = “sadness”;
20: end
21: end
22: end
23: end

```

Table 18 displays CrystalFeel results from January 8 to January 14, 2022. After applying the LDA algorithm to the Twitter dataset for each day, the top ten keywords for each topic were then retrieved and utilized as inputs for the CrystalFeel algorithm. This process was repeated for each day's tweets dataset.

Table 18. Emotion intensity analysis during crisis life cycle.

| | Date | Fear Intensity | Anger Intensity | Joy Intensity | Sadness Intensity | Emotional valence |
|------------------------|------------------|----------------|-----------------|---------------|-------------------|-------------------|
| Prodromal stage | January 08, 2022 | 0.444 | 0.402 | 0.131 | 0.285 | 0.316 |
| Acute stage | January 09, 2022 | 0.415 | 0.462 | 0.103 | 0.292 | 0.318 |
| | January 10, 2022 | 0.413 | 0.475 | 0.109 | 0.371 | 0.342 |
| Chronic stage | January 11, 2022 | 0.445 | 0.441 | 0.377 | 0.468 | 0.433 |
| | January 12, 2022 | 0.237 | 0.103 | 0.541 | 0.208 | 0.272 |
| Termination stage | January 13, 2022 | 0.105 | 0.10 | 0.543 | 0.125 | 0.218 |
| | January 14, 2022 | 0.421 | 0.449 | 0.041 | 0.443 | 0.339 |

3.4 Results

3.4.1 Temporal distribution of online responses during the crisis life cycle

Figure 16 shows the time and frequency analysis by drawing a comparison between time, the number of tweets, and the number of deaths during the crisis life cycle. According to the extended Fink's four-stages of crisis and disaster model, the news about the first death on the domestic news channel appeared after more than 15 h of the crisis in the prodromal stage. As soon as the death toll rose from January 09 (00:00 a.m. and onward), the number of tweets began to increase till January 12 (11:59 p.m.) in the acute and chronic stages of the crisis, indicating that social media began to pay more attention to the negative destination events

during crisis. The diffusion of information through social media causes negative psychological impacts on the public, such as fear, anger, or sadness. However, the number of tweets began to decline from January 13 (00:00 a.m. and onward) soon after the destination managers and the DMAs took massive measures (improving service delivery, banning the inflow of tourists to Murree, restoration of electricity and telecommunication services, and clearing roads with the help of heavy machinery) to rescue the tourists in the termination stage of the crisis. As a result of these measures, the death toll and public online discussion began to decline. The crisis brought more negative discussion on Twitter than the 2018 incident in Murree, when violent videos targeting tourists were viral on different social media platforms. Also, overfeeding the reports will cause digital communication weariness, reducing the media's impact. As a result, the government and the digital media should devise appropriate discussion topics to keep the public vigilant about the crisis while experiencing less mental strain.

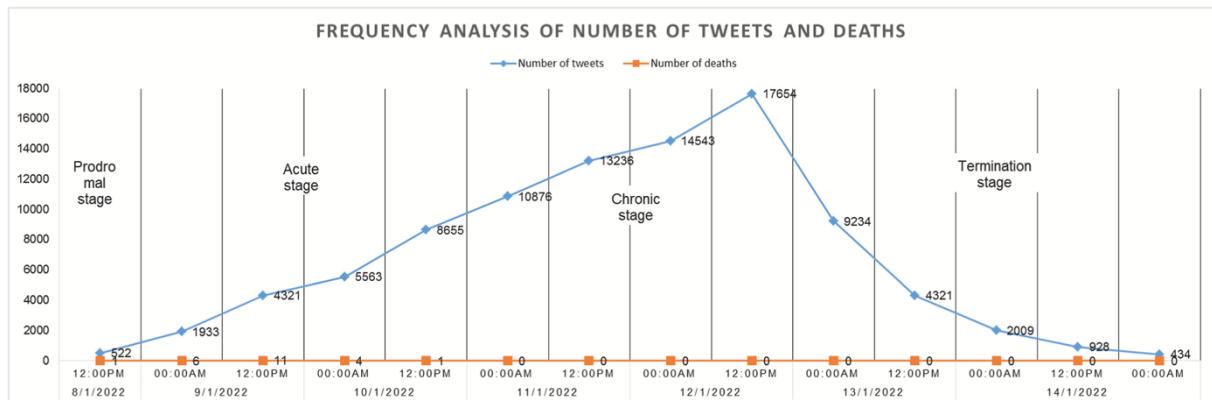


Figure 16. Temporal analysis of public discussion across the number of deaths during the crisis life cycle.

3.4.2 Topic-wise public response

Table 16 shows the themes, underlying topics with associated keywords and their corresponding TF-IDF values. The current study classifies the topics discussed on Twitter into ten different themes. Based on TF-IDF values and the Intertopic distance map (Fig. 14), theme 10 (tourists' switching intentions) and theme 1 (voicing and portraying a negative image of Murree as a tourism destination) are the most popular themes of public discussion on Twitter during the crisis life cycle, respectively, followed theme 5 (stories from individuals in Murree), theme 4 (justification of experiences by tourists), and theme 3 (conspiracy about the destination). Together, they made up about half of the content. Moreover, less than one-twentieth of the tweets were associated with theme 6 (punitive desire among tourists and local communities). To this end, about one-seventh of the tweets related to the Murree crisis were

part of theme 9 (the mature tourist behavior) and were included in less than one-thirtieth of all tweets about the crisis.

Theme 10 and Theme 1: Following themes of tourists' switching intentions and voicing and portraying a negative image of Murree as a tourist destination, the public discussed and raised concerns on social media, who vilified Murree as an unwelcoming vacation spot and vented their resentment over the misconduct of the tourism and hospitality service providers, and related industries. People on social media were also driven to distress the destination's monetary outcome because they thought that the money they spent on visiting the destination as a result of what they said on social media would bankrupt them and make them rethink how they treat their guests. Social media users also advocated substituting the nation's most popular tourism destination (i.e., Murree) with other competitive destinations, giving the idea that boycotting Murree would incur minimal substitution costs. These findings are consistent with the work of Fakfare et al. (Fakfare et al., 2020), who highlighted the significance of developing "second-tier destinations." These secondary destinations contribute to the preservation of the nation's social and cultural capital. Moreover, digital media users were encouraged to validate and authenticate other tourists' moral misconduct during their excursions to Murree. This served to add more momentum to the animosity and betrayal the Murree as a tourism destination.

Theme 5: Regarding theme stories from individuals in Murree, users of social networking sites were encouraged to confirm the stories of other travelers who have had bad experiences while visiting Murree, thereby the moral misbehavior was validated and authenticated, which spread negative word-of-mouth gave the boycott campaign even more momentum.

Themes 4 and 3: Justification of experiences by tourists and conspiracy about the destination themes connect the visitors to help tourists establish a more positive identity and have a more positive public perception, all of which are positive outcomes of public response to the event. According to Tomhave & Copat (2018), some people think it is their moral duty to punish a spot by not going there because they want to be seen as ethical people. This relates to the discussion concerning the ostensible "moral shift" in the behavioral studies, which emphasizes that consumers might care not only for "their own" and nearby individuals but also for unfamiliar people physically distant. As a result, digital activism becomes a tool for fostering a sense of expanded community in this environment (Flores-Marcial, 2021). Moreover, self-improvement is a strong motive based on an individual's self-perception and the desire for others' praise. Because of this, people might sometimes be compelled to take part in boycotts to boost their self-esteem (Seyfi et al., 2021).

Theme 7: Call for the administration interpolation focused on the discourse evolved in which the ineffective role of the government was criticized, and a convincing need for government action was underlined to mainstream and regulate Murree's tourism and hospitality business.

Themes 6 and 9: Connecting themes of punitive desire among tourists and local communities and mature tourist behavior, social media users call on Murree's locals to play a significant part in overcoming the destination's poor image among tourists. The responsible attitude of tourists that focuses on the appraisal for rescue organizations and calls for tourism regulations leads to shielding the nation's domestic tourism business. Tourists were instructed to demonstrate sensible conduct in conserving the concrete and intangible components of the place, as a successful tourism experience is co-created by destination service staff and tourists (Yousaf et al., 2021). In this way, government interventions helped diminish tourists' negative experiences in Murree to minimize the severity of the problem.

Theme 8: For the Prevention and disaster control procedures theme, the emergency response organizations and local administration must interact with the citizens using digital media during the disaster. As a result, central government agencies, rescue and health organizations, and community control measures are highlighted in tweets. Optimistic projections are given, backed by aggressive public well-being measures, to alleviate unwarranted public anxiety and panic and reassert the nation's trust in the destination.

Theme 2: Wakeup call from media organizations pointed out that local and national media channels contributed to recent crisis bulletins besides social media. News express and ARY News were the most mentioned media outlets, followed by News18 Kashmir. The news media engaged in a people-centered approach when reporting the Murree disaster, thus paying attention to the notion of a warm society. Based on the electronic media reports, administrative and governmental agencies with ties to the tourism industry should take the lead in enforcing and supervising the law. In order to reduce the likelihood of tourists' animosity toward destination in the form of betrayal, a boycott, and sustaining the growth of the local tourism business, they should listen to the concerns of visitors, investigate the facts surrounding the incident, soothe tourists' anxieties, and maintain order in the tourism market.

3.4.3 Topic distribution over time

Fig. 4 displays the layout of the topic model, including 20 diverse topics shown as circles. The areas of the circles represent the overall frequency, while the center of circles was calculated by estimating the distance between topics. Using multidimensional scaling, the distances between topics are displayed on a 2D plane (Chuang et al., 2012). The transverse axis is

represented by PC1, and the longitudinal axis is characterized by PC2. Based on the topic modeling results and themes as a result of manual interpretation, Figures 17 and 18 depict the temporal dynamics of discussion topics during the destination crisis (from January 8 to January 14, 2022).



Figure 17. Dynamics of discussion topics from January 8 to January 14, 2022.

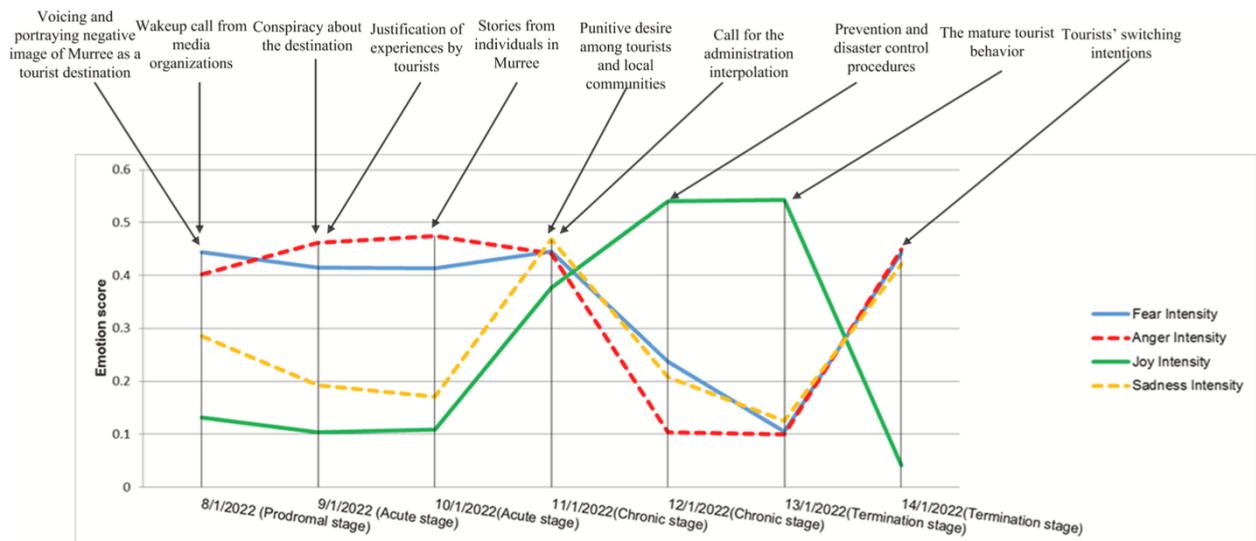


Figure 18. Sentiment dynamics during crisis life cycle.

In the Prodromal stage (First day of crisis), the news about the crisis aired on multiple TV channels (topic Leading news channels reporting). The public reacts to this media news: the topic of Public emotions toward negative events attract public attention. During the same period, the topic of Moral-based negative events also received public attention. Moreover, a

similar sentiment can be seen in online discussions about the topic, Hoteliers attitude toward tourists.

During the Acute stage (next two days of crisis), the different videos of the destination incidents were got viral on social media, including unprecedented snowstorms, weather alerts, massive traffic jams, and price hikes from service providers (hotels, restaurants, etc.), violence and attack toward tourists, tourists stuck inside their vehicles, and the dead bodies of victims including women and children. The relative distribution of topics throughout this time period does not exhibit substantial frequency disparities, but, even so, such themes are preferred as Boycott conspiracy, Poor facilities, and Content viral. The public also discussed the role of service providers and destination managers who viewed the incident. Still, it failed to support the victims and the role of service staff in emergencies in general (topics Negative destination image and Disaster stories), along with blamed the non-supporting behavior of others (topic Eyewitness report).

These negative events during the crisis had a tremendous reaction from the public in the Chronic stage, and the topic of Relief and action from the government substantially became prominent. Other popular topics in this stage are the Negligence of tourists since tourists did not bother about the weather forecast, similar negative events in Murree that happened in 2018 and the role of government agencies in avoiding such incidents. The emergency response organizations and destination managers communicate improved crisis control procedures, and discussion largely involves strict actions against those responsible for such negative events. Therefore, topics of Emergency response measures, post-crisis actions, and Urge for government intervention remain prevalent during this stage.

In the Termination stage, the debate largely spins around the image restoration of the destination, and safety guidelines, with the leading topics being Appraisal for emergency response organizations and Tourism regulations. Twitter users also stress the significance of destination regulations (topic Regulation for destination management). The topic of the Tourist-destination bond still gains a considerable attention. Finally, on the last day of the crisis life cycle, the Twitter discussion also emphasized and showed the most negative emotions toward the topic of Reaction from domestic and international tourists toward the negative events during the crisis.

3.4.4 Distribution of sentiments over time

Figure 18 shows that public response toward negative destination events during the crisis was characterized by anger as the most dominant emotion. As time goes, the public response turned

to fear on January 08, 2022, in the prodromal stage of the crisis. Conspiracy about the destination, justification of experiences by tourists, and stories from individuals in Murree marked the acute stage when public emotion turned to anger on January 09 and January 10, 2022, respectively. The next day (January 11, 2022), in the chronic stage, public emotions were categorized as sadness following the punitive desire among tourists and local communities and the call for the administration interpolation against hoteliers. However, an abrupt increase was observed in joy on January 12, 13, 2022 (chronic and termination stages), which marked the prevention and disaster control procedures by DMAs and mature tourist behavior. Tourists who intend to switch to other destinations saw this joy turn to sadness, anger, and fear on the following day (January 14, 2022). Figure 18 depicts a line graph of the four fundamental emotions from January 08 to January 14, 2022, along with significant events that transpired during the timeframe.

Figure 19 shows the frequency analysis of the greatest number of topic tweets as positive or negative emotions during the crisis. Topics classified 4218 (6.52%) tweets as having positive sentiments and 60,460 (93.48%) as having negative sentiments. Generally, negative tweets dominated in our sample during the crisis and outweighed positive ones with a ratio of 14.33 to 1.

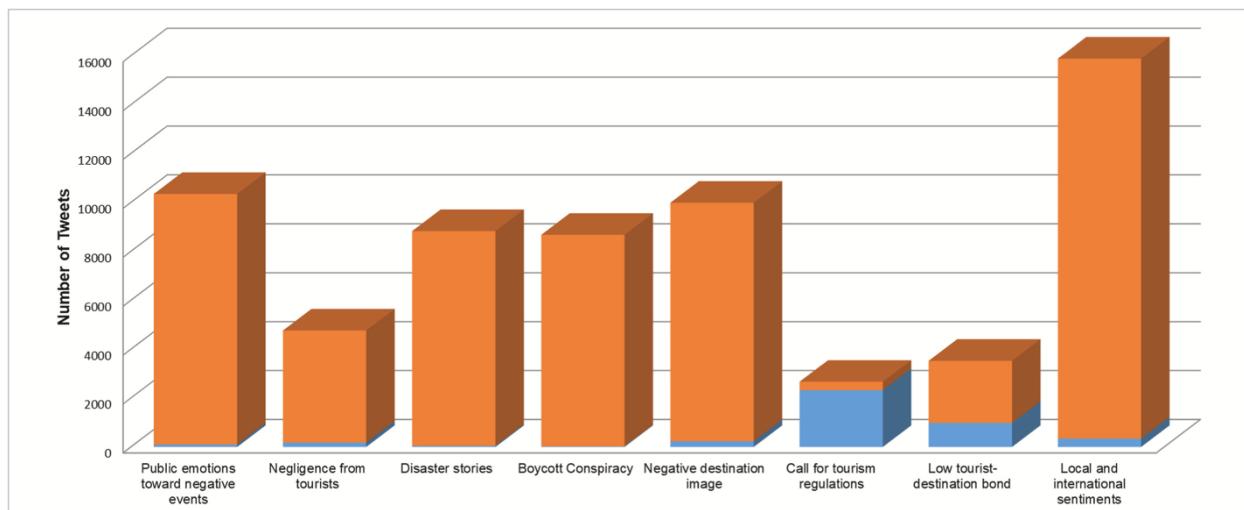


Figure 19. Frequency analysis of the most negative tweeted topics.

The findings indicate that the topic, local and international sentiments about the negative events during crisis received the highest number of negative tweets, followed by public emotions toward the negative events and destination image. Likewise, the public also showed negative responses on Twitter about disaster stories. Topics such as a call for tourism regulations and low tourist destination bonds also showed negative emotions in tweets, but their dominance was low among others.

In line with the previous research, the findings also indicate that overall negative sentiment tweets enhanced the public discussion on Twitter (Xu, 2020). Anger reigns supreme among distinct negative emotions in public discourse on Twitter. Fear dominates the sadness on Twitter during the crisis life cycle. Researchers have found that different degree of physiological arousal triggered by these emotions lead them to engage in a variety of human activities (Herman et al., 2018). Anger and fear-induced elevated arousal, which is associated with action-related activities. In contrast, sad people are less aroused and thus tend to be less active (King, 2020). Since content sharing is seen as an action-associated behavior (Berger & Milkman, 2012), it makes sense that anger and fear make people more engaged while sadness diminishes it. This paper also adds to Fink's four-stages of crisis and disaster model by looking at how the sentiment dynamics change in different phases of a crisis. Results show that fear-related words dominated in social media discussions in the prodromal stage. According to the "Emotional Stages of a Disaster" framework, public at this stage are more likely to experience distress (DeWolfe, 2000). The justification behind this finding is that prior to the crisis, social media users may engage with tweets that reflect their contemporary emotions. The findings further indicate that in our sample words related to sadness made tweets more engaging in the chronic stage while less engaging for fear. Following the "Emotional Stages of a Disaster" framework, the public may favor optimistic information that can bring emotional consolation in this stage. As a result, it is understandable that sad emotions do not involve Twitter users in public discussion at this stage (Xu, 2020). Finally, this study also reveals that tweets including phrases such as sadness were less engaging during the acute stage, while anger-related words dominated in the acute stage. This finding implies that negative emotions such as anger may be directly linked to tourists experiencing negative events (Bonifield & Cole, 2007). Moreover, overall, this study found a weak correlation between positive valence words and tweet engagement, thus in line with the previous investigation (Valenzuela et al., 2017). Extant research has found that people process negative information more quickly as compared to positive one (Rozin & Royzman, 2001). However, due to the risky nature of the negative information it should be carefully evaluated during the crisis events for self-protection. In this vein, these results should be viewed cautiously, as they might only apply to negative destination events such as service encounter failures, unethical destination, and a snowstorm or similar disasters.

3.5 Discussion

Using text mining methods (i.e., topic modeling and sentiment analysis) and theoretical lens of the attribution theory and extended Fink's four-stage of crisis and disaster framework, this paper

identified the main topics in online public discussion toward negative destination events and how these topics and their associated sentiments evolve during the crisis life cycle. The destination Murree, a quaint colonial town situated in the Himalayas' foothills and Pakistan's most famous tourism destination, has been used as the study context. Since Murree is generally considered one of the most gorgeous and aesthetically pleasing sites in the country, it has undergone rapid expansion over the past decade. It now is often facing accusations of being an overcrowded, littered, and booming tourism destination. However, it continues to be extremely popular among domestic and international tourists, for whom it is a true tourist paradise, and it earns rave reviews from this group. Despite the fact that Murree's business people have reached the pinnacle of commercialism, there is no rule of conduct regulating hotels, transportation, parking, or any of the other services in Murree (Dawn, 2022). Digital media, in conjunction with digital activism, played a vital role when it came to raising tourists' voices by protesting against the unethical behavior of destination service providers toward tourists and attributing crisis responsibility to emergency response organizations, destination managers, hotel staff, hoteliers, transportation providers, and the local community in Murree, thus, call for a destination boycott (Daily Times, 2022). As the "Boycott Murree" campaign extended traction on social networking sites, its consequences immediately became apparent in tourism, and all of Murree's tourism and hospitality-related industry experienced a 70% reduction in commercial activities during the peak season (Tribune, 2022).

3.5.1 Theoretical implications

The findings of the study advance the tourism crisis management literature and offer important theoretical contributions. First, the study findings provide a significant contribution to digital consumer activism (Shaheer et al., 2021; Mkono, 2018; Ciszek, 2016) and crisis informatics research (Su et al., 2019; Kim et al., 2018; Xu, 2020; Cao et al., 2022) in the hospitality and tourism domain by offering an analytical investigation into the practical utility of monitoring public online discussion toward negative destination events, thus providing useful information that could help the prevention of negative image consequences. Social networking sites have become a key instrument for initiating digital activism, sometimes known as "cyber activism," in the tourism business (Mkono, 2018). Social media activism is unique since historical patterns of secondary crisis communication are readily available (Ciszek, 2016). This aspect is captured through a text mining approach by analyzing public discussion on social media. Results show that the temporal dynamics of the public discussion themes and their associated topics across different crisis life cycle revealed that Twitter users are influenced by not only the destination image during negative events (tourists' switching intentions and voicing, portraying negative

image of Murree as a tourist destination) but also by the actions taken by DMAs for prevention and disaster control procedures, the mature tourist behavior, and the third parties such as electronic and print media (wakeup call from media organizations). The fluctuating intensity and focus of internet discussions indicate shifts in public perception of the crisis and the involvement of the destination hospitality service providers (e.g., hotels, restaurants, etc.) in it. This is notably visible in the theme Stories from individuals in Murree, which quickly boosted its proportion of the overall debate after the negative news about the service providers' attitude toward tourists was broadcasted. These results complement and recall previous findings of other scholars, such as by Abramova et al. (2022), according to which public reactions to crises fall within the four clusters "understanding", "action planning", "hope" and reassurance. In general, results also confirm findings about how social media data mining can reveal public reactions to crisis events, as reported by Servidio and Ruffolo (2016) and Shah et al. (2021), and further shows that negative events in tourism destinations are likely to receive wide-ranging negative public coverage (Breitsohl & Garrod, 2016; Su et al., 2022).

Second, it offers insights into the often overlooked internally induced negative events (rather than externally induced crises, such as health crises and natural disasters) (Breitsohl & Garrod, 2016; Su et al., 2022). Internally induced negative destination events involve a range of emotions that encourage tourists to share new and more interesting social experience (Breitsohl & Garrod, 2016). Emotions carry a varying effect for tourist experience in different stages, implying that emotions are the most critical factors that drive tourism industry (Servidio & Ruffolo, 2016). This issue has been examined using a qualitative analysis, specifically by examining public tweets on Twitter. In the light of our findings on tourists' discrete emotions during internally induced crisis, each emotion linked to the proposed extended perspective on Fink's four-stages of crisis and disaster framework in conjunction with Emotional Stages of a Disaster model, which is a novel contribution to the literature of travel and tourism crisis (Xu, 2020; Kuushwaha et al., 2021). It is noteworthy that the tourist's emotional experience and intensity varied across different crisis stages (Xu, 2020). In line with the other disaster events (Xu, 2020), our results indicate that tourists' reactions as anger may lead to emotions, such as fear, sadness, and joy across the crisis life cycle. Since the literature in the crisis domain has mostly ignored the follow-up tourist behavior (Fediuk et al., 2010), this research is important because it gives academics a theoretical roadmap for future studies. By extending it to the novel paradigm of negative destination events, our research further broadens the application of attribution theory, which has so far been limited to post-crisis consumer behavior (Kang et al., 2021) and tourist behavior toward a destination (Su et al., 2020). Since the disaster models

suggest a better representation of how tourists negative attribution narratives to warn other tourists, such as severity of events and attribution of obligation about assumed culprits during the various stages of the crisis, this research also provides support for the conceptual validity of attribution theory to the tourism crisis management context (Breitsohl & Garrod, 2016). In this sence, our findings are consistent with research in tourism, which underlines that emotions are important in the destination evaluation (Breitsohl & Garrod, 2016; Servidio & Ruffolo, 2016; Luo & Zhai, 2017).

Methodologically, the current study contributes to tourism crisis management literature by advancing the existing approaches of analyzing tourist perception (Su et al., 2022; Breitsohl & Garrod, 2016; Zenker et al., 2019; Kim & Pomirleanu, 2021) through state-of-the-art analytical tools to capture the tourists' emotions. Since existing literature has focused on tourists' behavior through the experimental setup and primary data analysis through surveys, where the core motivations are already known (Su et al., 2022; Breitsohl & Garrod, 2016; Servidio & Ruffolo, 2016), limited studies in the tourism domain analyze secondary data from digital channels, where tourists often share their concerns, experiences, and suggestions to DMAs, destination management stakeholders, and others (Su et al., 2019; Kim et al., 2018; Aggarwal & Gour, 2020). This lack of focus raises an intriguing research question about the actual implications of tourist online narratives (Aggarwal & Gour, 2020), which can be answered by analyzing actual public discussion data from Twitter with advanced computational tools (Machine Learning algorithms). The underlying findings from crisis analytics would help the tourism industry and associated emergency response agencies guide preventive and post-event actions, strategic development, and policy formation to save tourism economies from economic losses. This work theoretically makes a significant contribution to design research theory, by demonstrating how cutting-edge data analytics techniques might capture the patterns and tones in data.

3.5.2 Practical implications

Based on the findings presented as well as observations from crisis management in the Murree case, several learnings can be inferred from the incident. The authors hence suggest the following crisis management implications for destination stakeholder institutions, including tourism and hospitality service providers, destination managers, and emergency response organizations for similar and future application cases in relation to preventive and post-crisis strategies.

First, the study's most critical marketing implication is that destination mangers should be aware that mistakes made by any service provider at a destination could lead to an adverse event

occurring there (Reddy et al., 2020). As a result, destination managers are advised to be adequately prepared to deal with adverse situations. Simultaneously, they should develop a viable strategy for mitigating adverse tourist reactions, such as animosity or boycotting the destination. The study findings also advise destination managers to wisely analyze the factors that tourists perceive as responsible for such negative events; the impoliteness of the service employees in the Murree incident was identified as the most significant underlying issue that arose from our investigation. As a popular tourist destination, overcrowding is a major problem for service workers in Murree which could lead to long working hours. In the past, service providers such as hotels and restaurants were disrespectful to domestic tourists because of the persistent demand during peak seasons. As a result, service staff and the service industry became complacent, prompting retaliation in the form of denigrating Murree as a tourist spot and exhibiting a punitive willingness to hold hospitality and tourism-related businesses in Murree liable for their poor service (Yousaf et al., 2021). In this context and in line with the previous research on negative events (Cai et al., 2018), employee regulations regarding short working hours as well as training and coaching for service professionals, are strongly advised by the authors. Moreover, fostering a quality customer service is the prerequisite for customer retention and for future growth in the tourism and hospitality industry (Rabiul et al., 2022). In a similar vein, it is important to keep an eye on the service attitude and public relations strategies of different players involved in a destination. From the point of view of internal management, destination managers should train their workers and linked companies, raise safety awareness, develop a positive image, and enhance crisis awareness of all departments. For external management, related units should swiftly issue and modify important practice standards and conduct external oversight of managing tourism sites via random inspections and supervision (Su et al., 2022).

Second, the destination's failure to design a unified crisis communication strategy on social and traditional media have caused a greater damage to destination image. As a whole, the destination managers and the DMAs used social media sparingly during this crisis, which opened doors for fake news, assumptions, discussions about the destination issues that were either directly or indirectly connected to the negative events, and even calls for a destination boycott (Yousaf et al., 2021). For example, topic themes Conspiracy about the destination and Stories from individuals in Murree included referenced incidents that have no basis in truth. Since social media makes it easy to organize and promote such emotions toward negative events (Yu et al., 2020); thus, destination managers should take focused actions by making implicit information explicit to public which could lessen their negative perception of the destination

events (Wang & Ritchie, 2012). They should use different social media channels such as Twitter, to explain and apologize because this helps to calm down intense negative emotions (Yu et al., 2020; Coombs & Holladay, 2008). In addition, reduced accommodation prices, discounts for visitors, vouchers, free orders, and other forms of reparation can be employed so that tourists perceive a factual admission of fault and feel less betrayed. Such approaches can be regarded as important to enable crisis response strategies (Yu et al., 2020; Su et al., 2022; Wang & Ritchie, 2012).

Third, since negative events could have a more significant detrimental effect on tourists' opinions, emotions, and future conduct, sincere and prompt apologies may not be merely enough. Emergency response organizations and news media should accept tourist complaints and embrace law enforcement and supervisory obligations. Officials must uncover the fact about the negative events, ease tourists' emotions, manage the tourism marketplace, and rapidly identify the opinion trends to reduce the likelihood of a boycott and safeguard the growth of the local tourism business. In parallel, destination managers should actively promote a positive image via multiple channels. Service providers should prevent boycotts by expressing enthusiasm and sincerity, reducing the tourists' negative cognitive emotions, communicating that a boycott is not a viable way out of the dispute, and expressing their willingness to offer facilities to all tourists with a positive destination experience (Su et al., 2022). Such crisis response strategies have been adopted by the businesses in the tourism and hospitality domain and got better response (Su et al., 2022; Breitsohl & Garrod, 2016; Yousaf et al., 2021; Yu et al., 2020).

3.5.3 Limitations and future research directions

Even though the study made some important contributions, this work has several limitations that suggest future research opportunities. First, the current study confirmed the big data analytics capabilities in analyzing public reactions in case of various stages of human-managed crisis events. Big data analytics has also turned out to be a critical field in a similar vein of research Kushwaha et al., 2021), we encourage future scholars to examine how well DMAs use big data analytics to provide real-time insights in order to respond to any other crisis. Second, the study's implications explain the numerous crisis mitigation strategies across four stages of crisis that can be explicitly supported using big data analytics. However, the current study did not consider the disaster recovery stage in the disaster life cycle, the stage that required future researchers' attention. Third, the discussion forums and social media platforms are publicly available and therefore provide important avenue for sharing opinions, feedback, and

recommendations about goods or service experience for the customers or businesses. Customers and competing destinations may abuse these platforms by spreading false information and spreading rumors in order to harm the reputation of the destination (Kumar et al., 2021). Such practices have the potential to have a negative effect on the business of any destination. Future researchers could investigate misinformation detections and risk assessments using text mining and NLP to gain a deeper understanding of user requirements in the tourist and crisis management field. Third, the current study anchored the experience design research in the space of twitter informatics in tourism domain. Consumers share their negative experiences via user-generated content in a variety of categories, such as negative shopping experience, product boycotts., etc. To gain interesting insights into other domains, future researchers could extend the conceptual model presented in this study to other experiential contexts.

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P4. Navigating Negative Experiences: How Do They Influence Tourists' Psychological and Behavioral Responses to Tourism Service Failures on Social Media

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Abstract

This study explores how failures in tourism services, particularly those shared online as negative destination experiences (ONDEs), affect tourists' psychological and behavioral responses. Using sensemaking theory and structural equation modeling, we evaluate the psychological responses of perceived betrayal and anger and behavioral outcomes, such as boycott intentions, desire for revenge, complaining, and forbearance, in 307 domestic tourists. The results indicate that ONDEs significantly enhance perceived betrayal and anger, intensifying negative behavioral responses, except for complaining. Robust tourist-destination relationships can mitigate these effects by mediating betrayal and anger to minimize revenge-seeking and foster forbearance. These findings offer new insights into tourists' post-consumption psychology and behaviors, highlighting the role of relationship quality in offsetting adverse tourism outcomes. This research uncovers a new mechanism for understanding tourists' emotional and behavioral responses to service failures on social media, offering valuable implications for managing online reputations and promoting resilience in the domestic tourism industry.

Keywords: Tourism service failures; negative experience; perceived betrayal; tourism boycott; customer revenge; tourist forgiveness

Citation:

Schweiggart, N., Shah, A. M., Qayyum, A. & Jamil, R.A. (2025). Unfolding Tourists' Psychological and Behavioral Responses to Destination Service Failures: The Mitigating Effect of Relationship Quality. *Asia Pacific Journal of Tourism Research* (in press). <https://doi.org/10.1080/10941665.2025.2471492>

4.1 Introduction

As a crucial aspect of the global economy, the tourism industry is recognized for its dynamic nature and its focus on providing exceptional service to maintain its competitive advantage. However, the industry's high level of human involvement (Kim & So, 2023) and inherent characteristics of inseparability, heterogeneity, and perishability (Kim & So, 2022), render it particularly vulnerable to service failures (Breitsohl & Garrod, 2016). These failures, whether arising from internal errors (e.g., human or institutional) (BBC News, 2014) or external factors (e.g., natural disasters or pandemics), significantly affect tourists' perceptions and intentions to revisit (Shaheer et al., 2021; Su et al., 2022). For instance, according to a Statista survey (2020), after experiencing poor service, 62% of U.S. respondents ceased business with a brand, and 96% considered switching providers. Despite the significant impact of service failures, limited scholarly attention has been paid to those caused by internal errors (Shah et al., 2024), necessitating a more thorough understanding of tourists' psychological and behavioral responses to these failures.

In the digital age, social media magnifies the impact of service failures considerably, allowing tourists to instantly share their experiences with a global audience. This creates a pre-visit environment in which travelers encounter various stimuli related to potential tourist destinations that form enduring impressions. This study defines these specific pre-travel experiences as online negative destination experiences (ONDEs)—consumers' experiences of negative emotional responses or dissatisfaction due to interacting with a destination's digital presence across websites, social media, and review sites. On such platforms, content or user interfaces can evoke frustration, disappointment, or a negative perception of the destination. According to Hinton (2024), 75% of travelers are inspired to visit destinations through social media, with 48% actively sharing their travel experiences, influencing others' destination choices. This underscores the impact of social media on travel behavior (Rodin, 2017); unfavorable reviews and stories of disappointment can quickly disseminate negative perceptions (Kirilenko et al., 2021), discourage future travels, and damage a destination's reputation and economic viability (BBC News, 2022). Thus, it is crucial for tourism stakeholders (DMOs; Eisenstein 2014) to effectively understand and manage tourists' post-consumption responses (Tubillejas-Andrés et al., 2020) to service failures. Doing so requires immediate concerns to be addressed while implementing strategies to mitigate potential negative impacts locally and globally (Fakfare et al., 2020).

Prior research has highlighted the importance of online impressions of destinations in shaping travelers' intentions (Jiménez-Barreto et al., 2020; Qayyum et al., 2024) and the pivotal role of emotions in such processes (Xu et al., 2021; Yin et al., 2023). Tourists experience a range of emotions throughout their travels, which affect their overall satisfaction (Shi et al., 2022), likelihood of repeat visits (Zheng et al., 2024), and willingness to provide word-of-mouth recommendations (Liu et al., 2021). Although research on positive emotions is extensive (Godovskykh & Tasci, 2020), there is a need to explore the negative emotions that might arise from service failures (Harrison-Walker, 2019) and the overlooked, nuanced relationships between these emotions and subsequent behaviors. Understanding these interactions is vital for mitigating potential losses and enhancing service quality, particularly given the digital landscape of the modern era, where negative impressions can spread rapidly (Xu et al., 2021). This study strives to fill these gaps by examining how negative emotions, such as perceived betrayal—sensing a breach of the fundamental norms in the relationship between tourists and service providers—and anger, influence tourists' behaviors following service failure. This is essential for developing targeted strategies to manage these responses and enhance destination perception in the digital age.

Tourism research has also demonstrated that behavioral responses are key indicators of future actions (Xu et al., 2021). Tourists often rely on previous experiences to set expectations for trips (Godovskykh & Tasci, 2020). However, when encountering service failures, their dissatisfaction can escalate into intense emotional reactions, potentially damaging the destination's reputation (Harrison-Walker, 2019; Ro, 2013). These strong negative emotions, such as perceived betrayal or anger, are particularly significant as they can generate punitive behaviors, such as public complaints, boycotts, and negative word-of-mouth on social media (Breitsohl & Garrod, 2016; Cai et al., 2018). For instance, perceived betrayal might arise when travelers sense a violation of their trust, intensifying their emotional distress and motivating retaliatory behaviors (Su et al., 2022). These feelings often arise from unfulfilled expectations or breached commitments, eliciting a sense of unfairness that motivates tourists to pursue retribution or emotional release online, where grievances might be magnified and influence others' perceptions. Similarly, anger can trigger impulsive responses, with the airing of frustrations online exacerbating the reach and impact of tourists' dissatisfaction (Kim & Jang, 2016). Anger is an intense emotional reaction that frequently produces aggressive coping mechanisms, such as writing negative reviews, social media outbursts, and public complaints. These behaviors can damage the service provider's reputation and create a ripple effect by influencing the perceptions of others and discouraging potential tourists, further compounding

the damage. Such patterns emphasize the importance of examining the psychological and behavioral mechanisms that drive these responses to develop strategies to alleviate negative effects and improve crisis management in tourism.

Research has highlighted the negative outcomes that might arise from service failures (Xu et al., 2021); however, these effects are not always direct and can be mediated by various factors. A significant knowledge gap remains in comprehending the link between these intense negative emotions and extreme behaviors, especially in the context of social media, where emotional expressions can rapidly escalate and spread (Breitsohl & Garrod, 2016; Harrison-Walker, 2019). Despite the importance of these emotional catalysts, they are underexplored, necessitating further research to understand their impact on the relationship between service failures and subsequent tourist behaviors (Breitsohl & Garrod, 2016; Cai et al., 2018). This study seeks to address this gap by exploring the psychological and behavioral mechanisms that underlie tourists' responses to service failures and determining the role of perceived betrayal and anger as critical drivers of extreme behavioral responses.

The quality of the tourist–destination relationship is also significant in shaping tourists' perceptions, emotional reactions, and behavioral responses to adverse events (i.e., service failures) during their travels (Su et al., 2022). A high-quality relationship between the tourist and the destination is often characterized by trust, emotional attachment, and a sense of psychological comfort; these factors collectively influence tourists' evaluations of their experiences (Choi & Cai, 2018). These relationships establish a basis of goodwill, leading tourists to perceive adverse events as isolated incidents rather than systemic issues, fostering forgiveness and tolerance. However, the same strong bond might also intensify emotional responses when expectations are unmet, as breaches of trust can elicit more intense feelings of betrayal and anger. Elevated expectations might result in tourists with a deep emotional attachment to a destination reacting more intensely to service failures, resulting in behaviors such as public complaints and negative reviews. Although travel and tourism literature has acknowledged the importance of relationship quality (Lam & Wong, 2020; Su et al., 2022), whether such bonds mitigate or intensify responses to service failures remains unclear. Understanding this dual role (i.e., as moderator) is essential for formulating strategies that leverage relationship quality to enhance satisfaction and loyalty while limiting negative responses to service failures. Examining these dynamics offers valuable insights for enhancing tourist relationship management and nurturing resilience against service disruptions.

To address these research questions, this study examined tourists' post-consumption responses by exploring how negative experiences shared on social media influence their psychological and behavioral reactions. The objective was to reveal relationships between negative online experiences, emotions including betrayal and anger, and certain behaviors, including boycotting, seeking revenge, complaining, and forbearance. We thus sought to gain novel insights into the emotional processes that underpin these behaviors, facilitating the development of targeted strategies for tourism stakeholders, including improved crisis management and tailored communication efforts on social media to restore relationships with dissatisfied tourists (Qayyum et al., 2024). We also investigated the moderating role of relationship quality in the association between service failures and tourists' emotions and behaviors, offering insights into the effective management of tourist-destination relationships.

To explore these dynamics, we focused on the emerging Asian tourism markets (specifically Pakistan), acknowledging cultural differences in tourists' reactions (Shah et al., 2024; Shah & Schweiggart, 2023). In Pakistan, domestic tourists often exhibit notable distinctions from Western tourists, including variations in cultural orientations, communication styles, collectivist behaviors, and community expectations, which drive their distinct responses to service (Shah et al., 2024). These cultural differences emphasize the need to examine tourist behavior in regional settings; this is particularly essential in Pakistan, where the tourism industry contributes significantly to economic development, cultural exchange, and employment.

Upon the lifting of COVID-19 travel restrictions, Pakistan saw a significant increase in tourism, with over 1.2 million domestic and international visitors to its northern regions between 2021 and 2022. According to a report by the World Bank (2023), visitor spending reached approximately US\$16 billion in 2022 and is projected to increase to US\$30 billion by 2033, reflecting a 5.6 % annual growth rate. Pakistan's diverse tourism landscape comprises natural wonders, cultural heritage, and historical landmarks. Core attractions include the northern mountain ranges, Hunza, Skardu, and Fairy Meadows, the ancient Mohenjo-Daro sites, and religious landmarks, such as the Badshahi Mosque and Kartarpur Corridor. Despite the potential of its tourism sector, Pakistan faces challenges, including infrastructural limitations, inconsistent service quality, and safety concerns. Moreover, concerns around sustainability have arisen due to overtourism and poor service delivery. As digital platforms increasingly shape destination reputations, tourists' post-consumption responses highlight the need to address service failures and promote sustainable tourism practices to preserve Pakistan's rich potential as a tourist destination.

To achieve the study objectives, we surveyed 307 domestic tourists visiting Pakistan's Murree region. Murree was selected as the study site due to both its status as a premier tourist destination and the frequency of reported service failures. As a result of such failures, Murree has become a focal point for understanding how negative experiences influence tourists' emotional and behavioral responses, particularly in the digital age. Considering Murree's significance to Pakistan's tourism sector, the insights obtained from this study can inform strategies for enhancing service quality and crisis management in similar destinations.

Focusing on both pre-travel experiences and post-consumption responses, this work provides valuable insights into the long-term effects of service failures on customer behaviors, contributing to building a more resilient tourism industry by addressing the nuanced dynamics of emotions and relationship quality in shaping tourists' behavioral responses to such failures. Our holistic approach delivers strategic guidance for destination marketers, helping them to enhance tourists' digital and real-world experiences.

Drawing on sensemaking theory, this study uncovers a novel mechanism illustrating how ONDEs influence tourist behavior, highlighting how negative emotions, such as anger and betrayal, mediate these effects. The research also emphasizes the importance of relationship quality as a moderating factor, particularly in developing Asian tourism economies (specifically Pakistan), where relationships are highly valued and significantly influence tourists' responses (Shah et al., 2024). Focusing on both pre-travel experiences and post-consumption responses, this work provides valuable insights into the long-term effects of service failures on customer behaviors (Gijsenberg et al., 2015), contributing to building a more resilient tourism industry (Amru et al., 2023) by addressing the nuanced dynamics of emotions and relationship quality in shaping tourists' behavioral responses to such failures. Our holistic approach delivers strategic guidance for destination marketers, helping them to enhance tourists' digital and real-world experiences (Rodin, 2017).

4.2 Literature review and hypotheses development

4.2.1 Sensemaking theory

Sensemaking refers to the cognitive process by which individuals collectively interpret and assign meaning to shared experiences (Miles, 2012); this ongoing process shapes current and future behaviors as individuals interpret and categorize events (Gordon, 2023). In organizational studies, the emergence of the sensemaking perspective marks a shift from focusing on decision impacts to examining how meaning influences organizing processes.

(Stoiber & Schönig, 2024). According to Weick (1995), sensemaking involves a cognitive process for understanding unexpected events that comprises action, selection, and interpretation, connecting past, present, and future to provide a coherent interpretation of events.

The theory identifies three core elements: (1) signals, (2) frames, and (3) the relationships between them. *Signals* refer to information or stimuli from prior social experiences, while *frames* are the cognitive structures used to interpret these signals, developed from the current context. The interaction between these two elements generates meaning (Gordon, 2023).

This study employs sensemaking theory to explore how tourists' previous negative experiences shared on social media serve as signals (i.e., stimuli) that influence their current emotions, including perceived betrayal and anger, and shape their future behaviors. Frames are their cognitive interpretations of these experiences; "sense," or "meaning, arises from the dynamic interaction between signals and frames to guide future actions. This study focused on how previous experiences influence emotions, which, through frames, determine subsequent behaviors, highlighting frames that align responses with prior experiences.

To examine these dynamics, we utilized a survey design featuring stimuli related to social media campaigns concerning destinations' service failures. This approach helps us understand how severe negative experiences impact tourists' emotions and behaviors.

4.2.2 Hypotheses development

Travel and tourism experiences significantly influence how an individual perceives a destination (Pavesi et al., 2016). Traditionally, such experiences were formed through direct interactions (Kumar & Kaushik, 2018); however, digital platforms have amplified pre-visit engagement. Interactions with a destination's online elements, such as destination websites and social media, allow travelers to form early impressions and expectations—a destination's online presence marks one of the most important resources for planning a trip (Khan & Fatma, 2021). Thus, enhancing online experiences allows firms to reinforce customer relationships, as consumers increasingly use digital content to guide their travel decisions (Jiménez-Barreto et al., 2020).

Research has highlighted the positive impact of online experiences on consumer behavior (Khan & Fatma, 2021), yet the consequences of negative experiences remain underexplored. Studies have suggested that negative experiences more profoundly impact future behaviors than positive ones (Kim et al., 2021). Negative experiences, such as poor service or misleading information, can contribute to dissatisfaction and loss of trust, affecting future purchases and

engagement (Nagel et al., 2024; Yadav et al., 2023). Such experiences are often vividly remembered, prompting more intense reactions (Shah et al., 2024), which can lead to frequent, passionate expressions of dissatisfaction on social media (Qayyum et al., 2024) and, consequently, reputational damage and consumer loss. Addressing these negative experiences is essential in mitigating the negative behaviors of travelers.

Empirical studies have demonstrated the difficulty of overcoming negative experiences, which often result in diminished trust and feelings of betrayal when expectations are unmet (Su et al., 2022; Yadav et al., 2023). In digital contexts, unfulfilled promises and poor interactions severely undermine consumer confidence in the offerings of a destination (Rasouli et al., 2022). According to sensemaking theory, individuals derive meaning from interactions, and negative experiences can trigger perceptions of betrayal or anger, which distort future engagement and brand relationships (Miles, 2012; Su et al., 2022). Furthermore, Weick's (1995) theory suggests that emotional responses are triggered by external stimuli, such as tourists' cognitive appraisals of service quality, online content, and overall destination conditions. Negative emotions, such as anger, are more likely to stem from perceived unethical practices and substandard services encountered on social media, serving to intensify dissatisfaction and distress (Harrison-Walker, 2019; Shah et al., 2024; Xu et al., 2021). Considering these insights, this study proposes hypotheses rooted in the interplay between cognitive evaluations of tourists' negative experiences and emotional responses within digital interactions:

H1. Tourists' ONDEs positively influence their perceived betrayal.

H2. Tourists' ONDEs positively influence their anger emotions.

When traveling, tourists form specific expectations about service quality, which they then compare with their actual experiences. A gap between the services promised and those delivered often creates a perceived breakdown in trust or feelings of betrayal (Kim et al., 2022). Perceived betrayal refers to a customer's belief that a firm has intentionally violated relationship norms (Su et al., 2022). This occurs when service providers act deceptively or fail to meet contractual obligations, damaging trust (Lee et al., 2021) and eliciting negative consumer responses that harm brand loyalty and future purchases (Cai et al., 2018; Lee et al., 2013). Evidence suggests that perceived betrayal mediates the impact of negative events on purchase intentions and boycotts (Hogreve et al., 2017; Su et al., 2022).

The effects of negative emotions, particularly anger, are more vivid and enduring than those of positive emotions due to their intense recall (Kim et al., 2022; Yin et al., 2023). Such emotions are often triggered by perceived unethical practices at destinations, which provoke negative

reactions from tourists (Breitsohl & Garrod, 2016). These emotions are strongly linked to avoidance behaviors, where tourists disengage from unsatisfactory providers due to perceived deceit or mistreatment (Kam & Deichert, 2020). Existing literature further demonstrates that emotions such as anger and betrayal drive consumer reactions, including boycott intentions (Harrison-Walker, 2019; Yu et al., 2020). Consumers typically engage in avoidance behaviors when they feel that they have been deceived or mistreated, opting to disengage from unsatisfactory providers (Kam & Deichert, 2020; Lee et al., 2013). These insights lead to the following hypotheses:

H3a. Tourists' **perceived betrayal** positively influences their **boycott intentions**.

H3b. Tourists' **anger emotions** positively influence their **boycott intentions**.

Customers' retaliatory intentions often arise from dissatisfaction with service experiences, especially when service failures lead to a perceived breach of trust (Rasouli et al., 2022). The *desire for revenge* involves consumers acting deliberately to penalize service providers in response to perceived injustice (Lee et al., 2013), including negative word-of-mouth, complaints, and direct retaliation for perceived damages (Grégoire et al., 2009; Kadić-Maglajlić et al., 2024). Within the context of tourism, perceived betrayal is significantly linked to revenge; service failures or unethical practices often create feelings of mistreatment and injustice (Lee et al., 2021; Su et al., 2022), as consumers seek revenge to restore perceived fairness (Lee et al., 2013).

Similarly, negative emotions—particularly anger—strongly motivate retaliatory behavior. Anger stemming from service failures encourages consumers to seek revenge, especially when such failures are preventable or intentional (Grégoire et al., 2009; Harrison-Walker, 2019; Yin et al., 2023). For tourists, these emotions are amplified by the personal, immersive nature of their experiences (Yu et al., 2020). Thus, in the context of tourism, the relationship between perceived betrayal, anger, and retaliatory actions indicates that tourists' feelings of betrayal or anger may elicit the pursuit of revenge as a corrective measure, in line with consumer retribution-seeking behaviors (Yu et al., 2020). Based on these insights, we hypothesize that:

H4a. Tourists' **perceived betrayal** positively influences their **desire for revenge**.

H4b. Tourists' **anger emotions** positively influence their **desire for revenge**.

When a service experience falls outside the “acceptance zone” during service interactions or evaluations, it will often trigger customers' *complaining behaviors* (Tronvoll, 2011). Complaining behaviors include verbal and non-verbal communication and stem from unmet

expectations or dissatisfaction. They serve as a means of expressing this dissatisfaction and seeking remedies for perceived losses or betrayal (Ro, 2013).

Negative emotions, particularly anger, are significant drivers of complaint behavior (Tronvoll, 2011); in the event of failed service recovery, these emotions often lead to public complaints and negative word-of-mouth (Yadav et al., 2023). Complaint behavior is strongly influenced by aggression and perceived betrayal, which affect how consumers express dissatisfaction. (Lee et al., 2013; Tosun et al., 2022). Understanding tourists' complaining behaviors is crucial in the tourism and hospitality sectors, which are characterized by intense customer-provider interactions (Koc, 2019). Anger and perceived betrayal significantly increase the likelihood of customers filing complaints and engaging in actions that could harm a company's reputation, especially online (Lee et al., 2013; Souiden et al., 2019). Therefore, considering the relationships among perceived betrayal, anger, and complaining behaviors as a result of online negative service experiences, we hypothesize:

H5a. Tourists' **perceived betrayal** positively influences their **complaining behavior**.

H5b. Tourists' **anger emotions** positively influence their **complaining behavior**.

In response to service failures, some customers may choose forbearance, forgiving service providers (Guchait et al., 2019) instead of retaliating (Harrison-Walker, 2019; Rasouli et al., 2022). This approach is valued in cultures prioritizing harmony, as it involves suppressing negative emotions such as anger to maintain peace (Ho & Liang, 2021). Forbearance can lead to positive outcomes by allowing individuals move past negative experiences (T. Su et al., 2023), potentially resulting in reconciliation and repatronage intentions.

However, customer forgiveness can be challenging in the face of intense negative emotions. After service failures, anger, regret, and frustration can hinder such benevolent responses (Harrison-Walker, 2019). In Asian societies, where forbearance is culturally significant, it reflects benevolence and is a coping mechanism for preserving harmony (Ho & Liang, 2021; T. Su et al., 2023). Forgiveness can mitigate the negative behaviors that arise from perceived betrayal and brand hate (Rasouli et al., 2022), yet these emotions undermine the willingness to forgive, as distrust and frustration heighten the effort to overlook wrongdoings (Ho & Liang, 2021). Therefore, in light of the interplay between perceived betrayal, anger, and forbearance, we propose the following hypotheses:

H6a. Tourists' **perceived betrayal** negatively influences their **forbearance behavior**.

H6b. Tourists' **anger emotions** negatively influence their **forbearance behavior**.

Sensemaking theory (Miles, 2012) suggests that individuals strive to interpret and derive meaning from their experiences, particularly when they deviate from prior expectations (Peters & Fuchs, 2023). In the context of tourism, where consumer experiences significantly affect perceptions and future behaviors (Li et al., 2023), negative experiences often produce emotional responses, such as betrayal and anger (Rasouli et al., 2022).

Perceived betrayal arises when a customer feels that an organization has violated relational norms, diminishing trust and loyalty (Su et al., 2022). With respect to digital tourism, this might occur when a destination's digital portrayal—via websites, social media, or user reviews—fails to meet expectations. Such a betrayal erodes trust and acts as a mediator in transforming adverse feelings into specific behaviors, such as boycott intentions (Yu et al., 2020). Digital misrepresentations create deficits in trust, contributing to disassociation from the brand or destination (Qayyum et al., 2024; Shah et al., 2024). Similarly, anger might arise when a customer perceives service failures as preventable or intentional (Breitsohl & Garrod, 2016). In digital interactions, perceived intentional deficiencies aggravate anger, which serves to spur dissatisfaction through complaints, negative word-of-mouth, or revenge (Grégoire et al., 2009; Lee et al., 2013; Tronvoll, 2011). As a mediating factor, anger bridges the gap between adverse experiences and consumer behavior, motivating action against perceived injustices (Yin et al., 2023).

Recent literature has confirmed these dynamics, demonstrating that anger due to perceived betrayal in digital environments can rapidly escalate via online platforms, severely impacting a destination's reputation (Yadav et al., 2023). Additionally, intense feelings of betrayal and anger increase the likelihood of certain behaviors, including avoidance, complaints, and occasionally reconciliation attempts through forbearance (Ho & Liang, 2021). These insights support the mediating role of perceived betrayal and anger, translating ONDEs into behavioral responses, such as boycott intention, revenge, complaint behavior, and forbearance (Grégoire et al., 2009; Ho & Liang, 2021; Lee et al., 2013; Tronvoll, 2011; Yu et al., 2020). These emotions are critical intermediaries that shape consumers' reactions through disengagement, confrontation, or alternative coping strategies.

H7a: Perceived **betrayal**, as a **mediator**, significantly influences the relationship between ONDEs and future behavioral response outcomes.

H7b: Tourists' **anger** emotions, as a **mediator**, significantly influences the relationship between ONDEs and future behavioral response outcomes.

Relationship quality (Lam & Wong, 2020) is pivotal in comprehending consumers' behavioral responses to negative events (Harrison-Walker, 2019). The concept of relationship quality refers to the depth of emotional connection between consumers and brands, characterized by trust, commitment, and satisfaction (Gegen et al., 2024). High-quality relationships are significant influencers of consumers' perceptions and reactions, often forming part of their identity (Meng et al., 2023); they might act as a buffer against negative impacts as consumers defend the brand and overlook minor failures.

However, the buffering effect of high relationship quality is limited. Strong relationships create elevated expectations, and unmet expectations—due to unaddressed errors or perceived mistreatment—can intensify highly invested consumers' sense of betrayal (Lee et al., 2021). These consumers view failures as relationship violations, contributing to a more intense emotional response than those with lower relationship quality (Han et al., 2021). This dynamic is evident in the tourism context, where tourists form deep emotional connections with destinations that influence their attitudes, engagement, and expectations. Service failures can amplify disappointment, betrayal, and anger for those with a high-quality relationship with a destination or provider (Haj-Salem & Chebat, 2014; Kim et al., 2022).

Moreover, the ability of service providers to manage customer emotions is essential in maintaining tourist–destination relationship quality (Rajaobelina, 2018), influencing consumers' reactions based on the existing quality of the relationship (Huang et al., 2024). High-quality relationships might either escalate the impact of negative experiences due to a heightened sense of betrayal and anger or buffer minor infractions when expectations are met. Conversely, low-quality relationships may fail to evoke a strong emotional response due to subdued expectations (Huang et al., 2024). Therefore, relationship quality is a moderator that influences the direct and indirect effects of negative experiences, perceived betrayal, and anger on behavioral responses. We propose that:

H8. The consumer–destination relationship (low vs. high relationship quality) moderates the effect between all direct and indirect hypothesized relationships.

Figure 20 illustrates the research framework.

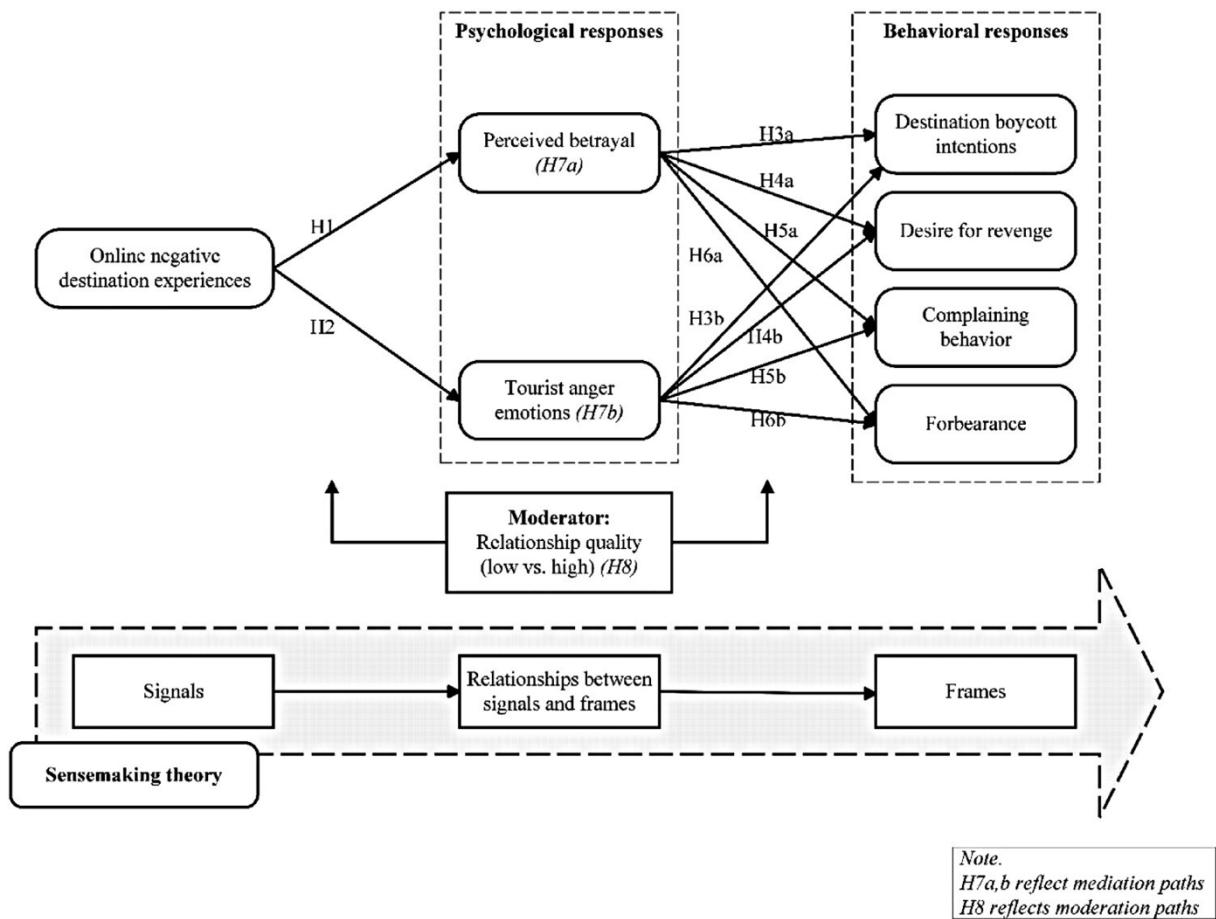


Figure 20. Theoretical framework

4.3 Methodology

4.3.1 Research context

Pakistan's tourism industry is growing rapidly, driven by its diverse landscapes and rich cultural heritage. The country's key attractions include UNESCO World Heritage Sites, adventure tourism in the northern mountain ranges, and landmarks of religious and historical significance. While such challenges as infrastructure gaps and environmental concerns remain, government initiatives and global promotion have positioned Pakistan as an emerging destination with immense potential. This study focused on the scenic colonial town of Murree; nestled in the Himalayan foothills of northern Pakistan, Murree is known as a premier tourist destination. Located between 6,000 and 7,000 feet above sea level, Murree is renowned as Pakistan's leading hill station due to its development and natural beauty year-round. The town's subtropical highland climate and attractions, such as breathtaking landscapes, mountain tourism, hiking trails, and the bustling Mall Road, appeal to visitors. Annually, Murree draws

over a million local and international tourists, and it is often described as a tourist paradise (Pakistan, 2022).

Murree's tourism industry is critical to the local economy, with its 25,247 residents (World Bank, 2024a) heavily dependent on tourism and its related services (Pakistan, 2022). The sector contributes 2.9 % to Pakistan's GDP (World, 2024), with a 5.6 % expected annual growth rate by 2027 (Arshad et al., 2018). However, over the past decade, increasing tourism has contributed to overtourism, causing Murree to become overcrowded. Complaints have increased concerning its inadequate services and inability to manage peak-season crowds. Local authorities and destination management organizations struggle with service provider oversight, which impacts the regulation of food prices, accommodation, transportation, and other tourism services.

In Murree, these challenges have spotlighted the issue of overtourism, reports of locals mistreating visitors, and excessive charges by service providers. Because of these issues, social media campaigns have emerged, playing a critical role in global protests and movements (Shaheer et al., 2021). Since March 2018, several hashtags have trended online, such as “#BoycottMurree” and “#ShameOnMurree,” advocating for a boycott of the Murree tourism industry. In January 2022, after a tragic incident in which 23 people, including 10 children, died from suffocation and hypothermia when trapped in vehicles during a severe weather event, the movement gained momentum. During that period of adverse weather conditions, hotel and food prices sharply increased from US\$30–50 per night to US\$350 (converted), which hindered visitors from seeking shelter and fueled public outrage toward service providers (WION, 2022).

This case exemplifies a significant social ethics issue, wherein online calls for a boycott of tourism serve as punitive measures against destinations violating social norms (Seyfi & Hall, 2019). On social media, the persistent use of hashtags underscores public condemnation and demands accountability from those who exploit visitors (Daily Times, 2022).

4.3.2 Research design

Social media is a powerful platform for pre-travel experiences, triggering individual concerns and responses to amplify public reactions to service failures more effectively than traditional media (Shaheer et al., 2021). Therefore, this study developed a stimulus based on the “#BoycottMurree” and “#ShameOnMurree” social media campaigns, which reflect public reactions to real destination incidents shared online. Gaining traction on Twitter, Instagram, and Facebook, these campaigns sparked widespread public responses (Shah & Schweiggart, 2023), and covered incidents from March 1, 2018, to March 31, 2022. As part of the stimulus,

the study presented participants with a brief description of the destination service failure accompanied by immoral destination images (see Appendix A). These stimuli were presented at the beginning of a self-administered mobile phone-based survey created using the *LimeSurvey* platform. Participation was voluntary, and informed consent was obtained before data collection.

Participants were domestic tourists visiting Pakistan's Murree region; they had all encountered negative experiences with destination service providers and, subsequently, had discussed them on social media. A purposive sampling technique was employed to select participants, targeting individuals who met the inclusion criteria of experiencing tourism service failures via social media. This approach was chosen for its suitability in identifying participants with specific characteristics relevant to the study's objectives. Considering the study's focus on tourists' responses to negative service experiences reported on social media, purposive sampling ensured participants had firsthand exposure to such incidents and could offer insights based on those experiences. Moreover, this approach enabled the recruitment of highly engaged social media users, ensuring their responses were relevant in the context of ONDEs. By focusing on a well-defined group, the approach also allowed for a thorough investigation of the research topic, aligning with the nature of the study and supporting the validity of the findings.

4.3.3 Measurements

The study's measurement items were adapted from prior research and were assessed using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). While most items were previously validated, modifications were made to fit the study context. Some items were reverse coded to present an opposite or negative perspective, reducing response bias. The scale items were sourced from various studies: *ONDEs* (five items) from Kim et al. (2021); *perceived betrayal* (five items) from Su et al. (2022); *tourists' anger emotions* (eight items) from Bonifield and Cole (2007) and Grégoire et al. (2010); *destination boycott intention* (six items) from Su et al. (2022); *desire for revenge* (six items) from Lee et al. (2013) and Grégoire et al. (2010); *complaining behavior* (three items) from Tosun et al. (2022); *forbearance* (four items) from Ho and Liang (2021); and *relationship quality* from Su et al. (2022). Appendix A lists the adapted items. Control variables were included to examine other factors' potential influence on negative emotions and future behavioral responses.

4.3.4 Testing the questionnaire

A two-stage pre-test was conducted to ensure clarity and effectiveness before the main survey. In the first stage, the questionnaire was tested with 20 domestic tourists visiting Murree who

had experienced negative interactions with service staff and locals at the destination and shared these encounters on social media. As a result of their feedback, refinements were made in question phrasing to enhance readability and eliminate technical jargon. In the second stage, two marketing academics reviewed the survey design, assessing its logical flow and conceptual consistency and offering additional insights for improvement. Following these refinements, a second pilot test was conducted with 17 visitors to evaluate the measurement scale's reliability and validity, ensuring the survey was well-structured and ready for full implementation.

4.3.5 Data collection

The study employed nonprobability sampling with a purposive strategy, targeting tourists over 18 who had shared negative tourism experiences on social media within the past six months. Data were collected via a self-administered, mobile phone-based survey; the survey code was distributed at prominent attractions in Murree, allowing participants to access and complete the survey on their mobiles. Since Murree is Pakistan's top tourist destination, it was likely that tourists had experienced poor attitudes from service staff and locals in Murree.

The survey was administered between May and July 2023, with responses captured throughout the day. Questionnaire items were randomized for varied reading sequences. Before distribution, survey supervisors assured participants of their anonymity and the confidentiality of their responses. Qualified respondents consented to participation if they met the criteria of having experienced negative service encounters via social media.

Participants who fulfilled the inclusion criteria were shown destination service failure stimuli at the beginning of the survey. They were asked to take five to ten minutes to recall their most recent experiences with service failure through social media. Used in critical incidents research research (Rasouli et al., 2022; Ro, 2013), this method helped refresh participants' memories and elicited vivid recollections of previous negative tourism experiences. To ensure data quality, incomplete responses and those exceeding a 20-minute completion time were excluded. Of 598 responses, 242 were incomplete or invalid, and 49 were discarded due to exceeding the time limit, yielding 307 valid responses.

The sample predominantly comprised individuals who were familiar with and had previously visited Murree (85.70%). Most respondents were male (57.70%), aged below 25 (69.70%), single (79.50%), and had a monthly income of PKR 100,001 or above (56.30%). Given that 64% of Pakistan's population is under 30, the younger demographic of the sample is relevant for understanding young travelers' travel patterns.

4.4 Results

The analyses were conducted using SPSS 24.0 to test the study's hypotheses. Initially, skewness and kurtosis values were examined for all items (see Appendix A), with any missing data excluded. Within the ONDEs construct, a few items were non-normally distributed. Consequently, confirmatory factor analysis (CFA) was performed to assess measurement validity. A Kaiser–Meyer–Olkin index of 0.88 and a significant Bartlett's test of sphericity ($p = 0.00$) indicated satisfactory sample adequacy for factor analysis (Hair Jr et al., 2010). Construct reliability and internal consistency were assessed using factor loadings, with most items loading satisfactorily on their corresponding factors (0.594 to 0.833), except for two items each in ONDEs and tourists' anger emotions. Three items were removed due to a low Cronbach's alpha. The revised analysis demonstrated satisfactory Cronbach's alpha and CR values (> 0.70), ensuring reliability and internal consistency (Hair Jr et al., 2017). Most constructs' average variance extracted (AVE) values exceeded the 0.50 threshold. However, the AVE values for constructs such as tourists' anger emotions and destination boycott intentions marginally met the 0.50 threshold. Despite this, further checks—including CR, factor loadings, and correlations with other constructs—confirmed adequate measurement reliability and ensured convergent validity, even with AVE values below 0.50 for these constructs. Discriminant validity was verified using both the HTMT ratio and the Fornell–Larcker criterion. All HTMT values were below the 0.90 threshold (Hair Jr et al., 2017), and the square roots of AVE values exceeded inter-construct correlations, which indicated sufficient discriminant validity (Fornell & Larcker, 1981) (see Table 19 for details).

Having confirmed the measurement scales' reliability and validity, the measurement model was further assessed using CFA. The results demonstrated an acceptable model fit with values $\chi^2/df = 1.57$, $p < 0.000$, $CFI = 0.94$, $TLI = 0.93$, $NFI = 0.85$, and $RMSEA = 0.04$, supporting the suitability of the data for hypothesis testing.

Table 19. Results of discriminant validity of measures and correlation matrix.

| Constructs | Assessment of discriminant validity using the Fornell-Larcker criterion | | | | | | | | Assessment of discriminant validity using HTMT ratio | | | | | | | |
|------------|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--|------|------|------|----------|----------|------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1.ONDEs | 0.77 | | | | | | | | 1 | | | | | | | |
| 2.PB | 0.38 | 0.75 | | | | | | | 0.47 | 1 | | | | | | |
| 3.TAE | 0.31 | 0.61 | 0.69 | | | | | | 0.44 | 0.70 | 1 | | | | | |
| 4.DBI | 0.24 | 0.47 | 0.59 | 0.69 | | | | | 0.35 | 0.58 | 0.73 | 1 | | | | |
| 5.DR | 0.06 | 0.30 | 0.37 | 0.39 | 0.77 | | | | 0.07 | 0.34 | 0.41 | 0.51 | 1 | | | |
| 6.CDB | 0.13 | 0.12 | 0.15 | 0.07 | 0.09 | 0.80 | | | 0.17 | 0.15 | 0.18 | 0.09 | 0.10 | 1 | | |
| 7.FRB | - | - | - | - | - | - | 0.68 | | - | - | - | - | - | - | - | 1 |
| 8.RQ | - | - | - | - | 0.03 | 0.06 | 0.21 | 0.77 | - | - | - | - | 0.04 | 0.09 | 0.28 | 1 |
| | 0.12 | 0.27 | 0.29 | 0.18 | | | | 0.16 | 0.33 | 0.37 | 0.24 | | | | | |

Notes. ONDEs=Online negative destination experiences; PB=Perceived betrayal; TAE=Tourists' anger emotions; DBI=Destination boycott intention; DR=Desire for revenge; CB=Complaining behavior; FRB=Forbearance; RQ=Relationship quality

4.4.1 Common method bias

Given the use of an online survey for data collection, we conducted Harman's single-factor test to address potential concerns about common method bias (CMB). The results showed that the single factor accounted for only 24.42% of the variance, well below the 50% threshold; this indicated a minimal impact of CMB. Following guidelines from Kock and Lynn's (2012), CMB and multicollinearity were also assessed by examining the latent variables' variance inflation factors (VIF). The VIF values were consistently below 3.30, confirming that neither CMB nor multicollinearity were significant issues in the dataset (see Table 20).

Table 20. CMB: Full collinearity estimates

| Variable | VIF values |
|--|------------|
| Online negative destination experience | 1.21 |
| Perceived betrayal | 1.89 |
| Tourists' anger emotions | 2.11 |
| Destination boycott intention | 1.72 |
| Desire for revenge | 1.28 |
| Complaining behavior | 1.09 |
| Forbearance | 1.38 |
| Relationship quality | 1.18 |

4.4.2 Structural equation modeling and hypotheses testing (direct effect)

We employed structural equation modeling (SEM) to examine how ONDEs following service failures affect tourists' psychological and behavioral responses. SEM affords simultaneous analysis of interconnected dependent variables while accounting for measurement error; as such, it offers deeper insights into the effects of service failures on tourist behaviors.

The SEM analysis showed good fit indices ($\chi^2/df = 2.55$, $p < 0.001$, CFI = 0.96, TLI = 0.85, NFI = 0.94, RMSEA = 0.07). The coefficients of determination (R^2 values) for perceived betrayal (0.14), tourists' anger emotions (0.09), destination boycott intention (0.38), desire for revenge (0.17), and forbearance (0.21) indicated adequate predictive accuracy. However, the relatively low R^2 value for complaining behavior suggested that additional factors may influence this construct.

The analysis confirmed that ONDEs directly impact perceived betrayal ($\beta = 0.39$, $p < 0.000$) and tourists' anger emotions ($\beta = 0.29$, $p < 0.000$), offering support for H1 and H2. Perceived betrayal and tourists' anger emotions significantly influenced destination boycott intention ($\beta = 0.16$, $p < 0.01$; $\beta = 0.46$, $p < 0.000$) and desire for revenge ($\beta = 0.14$, $p < 0.062$ marginally significant; $\beta = 0.35$, $p < 0.000$), yet negatively impacted forbearance ($\beta = -0.28$, $p < 0.000$; $\beta = -0.21$, $p < 0.01$), supporting H3, H4, and H6, respectively. However, contrary to expectations, perceived betrayal and tourists' anger emotions did not significantly affect complaining behavior ($\beta = 0.027$, $p > 0.10$; $\beta = 0.077$, $p > 0.1$), thus H5 was not supported (see Table 21). Additionally, age and gender were the only control variables that significantly influenced the desire for revenge.

Table 21. Structural equation modeling results

| Hypothesis | Path coefficient | t-Value | R^2 | Result |
|------------------------|---------------------|---------|-------|---------------|
| H1: ONDEs → PB | 0.39** | 7.19 | 0.14 | Supported |
| H2: ONDEs → TAE | 0.29*** | 5.61 | 0.09 | Supported |
| H3a: PB → DBI | 0.16** | 3.17 | | Supported |
| H3b: TAE → DBI | 0.46*** | 8.58 | 0.38 | Supported |
| H4a: PB → DR | 0.14* ^{ms} | 1.87 | | Supported |
| H4b: TAE → DR | 0.35*** | 4.43 | 0.17 | Supported |
| H5a: PB → CDB | 0.03 ^{ns} | 0.64 | | Not supported |
| H5b: TAE → CDB | 0.08 ^{ns} | 1.66 | 0.04 | Not supported |

Table 21 (continued)

| | | | | |
|-----------------------|----------|-------|------|-----------|
| H6a: PB → FRB | -0.28*** | -4.69 | | Supported |
| H6b: TAE → FRB | -0.21** | -3.23 | 0.21 | Supported |

Notes. Note 1: *p-value < 0.05; **p-value < 0.01; ***p-value < 0.001. Note 2: ns = not significant; ms = marginally significant.

4.4.3 Mediating effect

We utilized path analysis with bootstrapping (n = 5,000) and a 95% bias-corrected confidence interval to evaluate the statistical significance of the proposed mediation model (Hayes & Preacher, 2014). The bootstrap results in Table 22 demonstrate the indirect effects of perceived betrayal in the relationships between ONDEs and both destination boycott intention and forbearance. This is confirmed by the findings that (1) all p-values were below 0.05, indicating statistical significance, and (2) the bias-corrected 95% confidence intervals for all significant paths did not include zero. Additionally, tourists' anger was a key mediator, linking ONDEs with destination boycott intention, desire for revenge, and forbearance.

Table 22. Mediation evaluation using a Bootstrap analysis with a 95% confidence interval and 5,000 samples.

| IV | MV | DV | Standardized indirect effect | Bootstrap SE | Lower bounds | Upper bounds | Mediation Status |
|-------|-----|-----|---------------------------------|-----------------|-----------------|-----------------|---------------------|
| ONDEs | PB | DBI | 0.06* | 0.03 | 0.01 | 0.12 | Yes |
| | | DR | 0.05 ^{ns} | 0.04 | -0.01 | 0.14 | No |
| | | CDB | 0.01 ^{ns} | 0.02 | -0.03 | 0.05 | No |
| | | FRB | -0.11*** | 0.03 | -0.18 | -0.06 | Yes |
| | TAE | DBI | 0.13*** | 0.03 | 0.07 | 0.20 | Yes |
| | | DR | 0.10*** | 0.03 | 0.05 | 0.18 | Yes |
| | | CDB | 0.02 ^{ns} | 0.02 | -0.01 | 0.06 | No |
| | | FRB | -0.06** | 0.02 | -0.12 | -0.02 | Yes |

Notes. Note 1: IV = Independent variables, MV = Mediating variables, DV = Dependent variables; Note2: *p < 0.05; **p < 0.01; ***p < 0.001; Note 3: ns = not significant

4.4.4 Moderating effect analysis

A multigroup analysis assessed the hypothesized relationships (H8a-f) across participants with varying relationship quality levels with the destination. The sample was divided according to relationship quality, revealing significant differences in how ONDEs and tourists' anger emotions influenced the two groups. Specifically, the effect of ONDEs on tourists' anger was weaker for those with high relationship quality than those with low relationship quality. This indicated that tourists with weaker bonds are more emotionally reactive to negative experiences than those with stronger relationships. Furthermore, perceived betrayal had a greater influence on the desire for revenge for the group with low relationship quality, showing that revenge intentions are stronger when relationship quality is low. Among those with high relationship quality, tourists' anger more strongly influenced the desire for revenge, suggesting that anger is more predictive of revenge behavior in stronger relationships. Additionally, the mediating effects of perceived betrayal and tourists' anger emotions on the relationship between ONDEs and the desire for revenge differed between the two groups, confirming that negative emotions escalate revenge intentions. Notably, there were no significant differences in other path coefficients between the two groups, demonstrating that the effect of these relationships persists regardless of relationship quality. The multigroup analysis results are listed in Table 23.

Table 23. Multigroup analysis result on relationship quality

| Structural path | $\beta_{\text{low relationship quality}}$ | $\beta_{\text{high relationship quality}}$ | z-score | Testing difference | <i>Direct effects</i> |
|-------------------------|---|--|-------------|--------------------|-----------------------|
| | | | | | |
| H8a: ONDEs → PB | 0.43*** | 0.32*** | -0.94 | No | |
| H8b: ONDEs → TAE | 0.48*** | 0.16*** | -2.89*** | Yes | |
| H8c: PB → DBI | 0.09 ^{ns} | 0.159*** | 0.54 | No | |
| H8d: TAE → DBI | 0.56*** | 0.42*** | -0.98 | No | |
| H8e: PB → DR | 0.58*** | 0.02 ^{ns} | -2.99*** | Yes | |
| H8f: TAE → DR | 0.07 ^{ns} | 0.46*** | 1.91* | Yes | |
| H8g: PB → CDB | 0.12 ^{ns} | 0.01 ^{ns} | -1.26 | No | |
| H8h: TAE → CDB | -0.03 ^{ns} | 0.10* | 1.24 | No | |
| H8i: PB → FRB | -0.31*** | -0.26*** | 0.38 | No | |
| H8j: TAE → FRB | -0.16 ^{ns} | -0.22*** | -0.41 | No | |
| <i>Indirect effects</i> | | | | | |
| Structural path | Standardized estimates (β) | Lower bound | Upper bound | Testing difference | |

Table 23 (continued)

| | | | | |
|-------------------------------|---------------------|-------|------|-----|
| H8k: ONDEs → PB → DBI | -0.01 ^{ns} | -0.12 | 0.11 | No |
| H8k: OND → TAE → DBI | 0.02 ^{ns} | -0.09 | 0.14 | No |
| H8k: ONDEs → PB → DR | 0.25** | 0.09 | 0.47 | Yes |
| H8k: ONDEs → TAE → DR | 0.27** | 0.10 | 0.51 | Yes |
| H8k: ONDEs → PB → CDB | 0.05 ^{ns} | -0.02 | 0.15 | No |
| H8k: ONDEs → TAE → CDB | 0.06 ^{ns} | -0.02 | 0.15 | No |
| H8k: ONDEs → PB → FRB | -0.05 ^{ns} | -0.21 | 0.07 | No |
| H8k: ONDEs → TAE → FRB | -0.11 ^{ns} | -0.26 | 0.02 | No |

Notes: Note 1: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$; Note 2: ns = not significant

4.5 Discussion

This study integrated sensemaking theory to investigate the novel relationships between tourists' psychological responses to service failures and their consequent behaviors by analyzing their post-consumption responses. More specifically, it examined the effect of pre-travel ONDEs on tourists' psychological responses, including perceived betrayal and anger, and their subsequent behaviors (i.e., boycott intentions, revenge, complaining behaviors, and forbearance) in the context of service failures within Pakistan's emerging domestic tourism landscape. The study strengthened our understanding of these dynamics by integrating mediation and moderation models to demonstrate how tourists' psychological responses—specifically focusing on perceived betrayal and anger—mediate the relationship between predictors, such as ONDEs and behavioral outcomes. Meanwhile, it also highlighted the moderating role of relationship quality in shaping emotional and behavioral responses. As a result of this analysis, several critical conclusions can be drawn.

First, our research expands the theoretical understanding of destination crises in emerging Asian travel destinations, such as Pakistan, by demonstrating that pre-travel destination images—conveyed through the sharing of ONDEs—played a key driving role in tourists' psychological responses (Fan et al., 2022) such as perceived betrayal and anger. These emotions contribute to specific behaviors, including boycott intentions, desire for revenge, and reduced forbearance (Su

et al., 2022; Yin et al., 2023). Consistent with Hennig-Thurau et al. (2002), our findings support the notion that individuals react emotionally based on their interpretation of events. Building upon this, the results further highlight how ONDEs exacerbate emotional responses and influence subsequent behavioral decisions, corroborating Hofstede and McCrae (2004) findings that cultural contexts moderate responses to perceived injustices. Tourists who feel betrayed and angry exhibit lower forbearance levels (Bai & Chang, 2023), demonstrating that emotional responses can override tendencies toward harmony and tolerance. By broadening the framework of tourists' behaviors, this study offers insights into the psychological processes that underlie post-consumption responses to service failures and contributes to research on crisis management (Breitsohl & Garrod, 2016; Shah et al., 2024).

Second, we tested our hypotheses by examining the mediating roles of betrayal and anger in the relationship between ONDEs and tourist behavioral responses, offering support for sensemaking theory (Weick, 1995). The findings corroborate the work of Rasouli et al. (2022) and Su et al. (2022), demonstrating that the mediatory role of these emotions is crucial in translating tourists' ONDEs into retaliatory actions, such as boycott intentions and revenge behaviors, and decreasing forbearance for service failures. Moreover, the mediating role of anger corroborates the findings of previous studies (Ma et al., 2022; Yu et al., 2020) by demonstrating that dissatisfaction can prompt adverse behaviors, including negative word-of-mouth. This supports the notion that anger amplifies retaliatory actions while reducing forbearance. However, the results also indicate that anger and perceived betrayal do not mediate complaining behaviors, highlighting the necessity of exploring alternative mechanisms that drive this response. Consistent with Ma et al. (2022) and Yu et al. (2020), the results suggest that dissatisfaction often bypasses formal complaint mechanisms to instead manifest as social media-driven boycotts and revenge behaviors. These insights deepen our understanding of negative psychological processes in tourism marketing, offering valuable perspectives on how they affect post-consumption behaviors.

Third, we evaluated our hypotheses by investigating tourist-destination relationship quality (Lam & Wong, 2020; Su et al., 2022) and its moderating effect on tourists' psychological and behavioral responses to service failures. The findings indicate that high relationship quality diminishes the relationship between ONDEs and anger, as stronger attachments may prompt tourists to defend the destination against isolated incidents. However, the results also revealed a paradoxical effect; ultimately, highly attached tourists are more likely to engage in revenge behaviors due to lower tolerance for service failures, despite initially experiencing less anger

(Farhat & Chaney, 2024). This emphasizes the importance of preventing negative social media experiences to preserve high-quality relationships, particularly in the context of emerging Asian travel economies (i.e., Pakistan), where emotional sensitivity may be heightened due to emotional bonds and collectivist values (Qayyum et al., 2024; Shah et al., 2024). The concept of "love becomes hate" (Grégoire et al., 2009; Lee et al., 2021) further illustrates the emotional volatility in customer relationships, indicating that stronger attachments might amplify negative emotional reactions to service failures. However, weaker relationships may lead tourists to engage in revenge behaviors when they perceive a violation of expectations stemming from feelings of betrayal. This finding corroborates existing research indicating that tourists' responses are driven by the quality of their relationship with the destination (Choi & Cai, 2018; Lam & Wong, 2020). Although some tourists might forgive minor infractions due to emotional bonds (Tsarenko & Rooslani Tojib, 2011), others may perceive such failures as personal betrayals, prompting more severe reactions. These insights highlight the dual role of relationship quality in moderating emotional and behavioral responses, underscoring the necessity of managing tourists' expectations to foster resilience against service failures.

Finally, we examined the indirect moderation effect of perceived betrayal and anger on the relationship between ONDEs and tourists' desire for revenge, underscoring the variations between groups with high and low relationship quality. This finding indicates that emotions, including betrayal and anger, influence consumers' decision-making differently according to the strength of their relationship with the destination (Bowlby, 1982). Tourists with stronger relationships may process negative experiences more intensely, creating an amplified desire for revenge when their trust is violated. However, this study did not identify significant differences in the mediating effects of these emotions on boycott intentions, complaining behavior, and forbearance, which diverged from the results of prior research (Shah et al., 2024; Su et al., 2022). This deviation indicates that these behaviors may be shaped by other factors, including personality traits, coping mechanisms, or cultural influences. This requires further investigation; future research might examine these additional variables or employ qualitative approaches (E. Ma et al., 2022) to better understand the complex interplay between emotions, relationship quality, and behavioral responses. These findings highlight the importance of refining theoretical frameworks to capture the nuanced impacts of emotional and relational dynamics on post-consumption behaviors.

4.5.1 Theoretical implications

This study offers a number of theoretical contributions. First, it contributes significantly to prior research, expanding the understanding of tourists' psychological and behavioral responses to service failures while integrating sensemaking theory (Weick, 1995). It elucidates how pre-travel ONDEs, shared on social media, act as powerful stimuli shaping tourists' emotional reactions, including perceived betrayal and anger, and lead to behavioral responses such as boycott intentions, revenge behaviors, and reduced forbearance. By highlighting the influence of pre-travel negative online experiences, this study expands existing frameworks to account for pre-travel stimuli as antecedents of post-consumption behaviors. In doing so, it provides insights into how digital platforms amplify service failures.

Second, by focusing on how tourists process and respond to negative tourism experiences, this study addresses the topic of post-consumption interventions, which is underexplored in tourism research (Zhang et al., 2021). While prior studies (Chebat & Slusarczyk, 2005) have primarily emphasized real-time interventions, this research shifts the focus to post-consumption scenarios where lingering emotional impacts shape tourists' behaviors. By leveraging sensemaking theory, the study provides novel evidence to support the emotional mediation process, demonstrating tourists' reliance on prior experiences when interpreting failures (i.e., ONDEs), with perceived betrayal and anger acting as mediators between ONDEs and behavioral responses (Rasouli et al., 2022; Su et al., 2022). This mediation process is crucial since it highlights tourists' vulnerability to social media narratives and underscores the long-lasting impact of negative experiences, adding insights to Japutra et al.'s (2022) research on post-consumption responses.

Third, our study advances the understanding of relationship quality as a moderator of emotional and behavioral responses to service failures (Lam & Wong, 2020; Su et al., 2022). While previous research has primarily underscored the buffering effect of strong relationships in reducing negative emotional reactions (Tsarenko & Rooslani Tojib, 2011), this study introduces a nuanced perspective, demonstrating that relationship quality can mitigate or exacerbate emotional and behavioral responses. More specifically, tourists with stronger attachments may initially experience less anger toward online negative tourism experiences, reflecting a tolerance for isolated incidents. However, when their expectations are violated, they are also more likely to engage in revenge behaviors (Farhat & Chaney, 2024). This dual role emphasizes the emotional volatility inherent in collectivist cultures, consistent with the "love becomes hate" phenomenon (Grégoire et al., 2009; Lee et al., 2021). The findings reveal that high-investment

relationships amplify tourists' negative emotional reactions, as strong attachments intensify expectations and lead to greater disappointment when service failures occur. Conversely, low-investment relationships show a greater tendency toward revenge behaviors motivated by weaker emotional ties and a lower tolerance for service failures. These findings contribute theoretical insights into cultural variations (Hofstede & McCrae, 2004) in service failure responses and enhance relationship marketing theories within domestic tourism contexts. Additionally, they promote strategies to foster long-term resilience in destination marketing.

Finally, the study stresses the importance of contextualizing findings within cultural and regional frameworks (Kim & So, 2023). Unlike previous studies on global patterns, the present research highlights localized strategies for managing service failures in culturally diverse, rapidly growing Asian tourism markets, such as Pakistan. In contrast to studies centered on Western contexts, this work offers novel insights into how cultural factors within emerging Asian tourism economies influence emotional and behavioral responses. For instance, tourists from Asia, including Pakistan's domestic tourists, often exhibit collectivist tendencies (Hofstede & McCrae, 2004) and place a higher value on strengthening relationship quality. These characteristics might explain the observed variation in forbearance and revenge behaviors compared to findings in Western settings, where individualism often drives consumer responses (Yin et al., 2023). By situating the study within the Pakistani context, this research underscores the cultural specificity of responses to service failures, enriching the broader literature on cross-cultural consumer behavior. Furthermore, it provides resilience-building frameworks to enhance destination management practices in domestic tourism markets.

4.5.2 Practical implications

The present study has several practical implications for destination management organizations (DMOs), tourism marketers, and tourism managers, underscoring strategies for mitigating negative tourism experiences and promoting long-term resilience, particularly in culturally sensitive emerging domestic tourism markets such as Pakistan.

Our findings highlight the pivotal role of ONDEs in shaping tourists' pre-travel perceptions and post-consumption behaviors, emphasizing the importance of DMOs adopting proactive management strategies to minimize the intensity of service failures. Considering the influence of negative online content—including disappointing reviews, viral complaints, and social media trends—DMOs should implement reputation management systems and social media monitoring tools. Such systems can help track dissatisfaction, address misinformation, fill service gaps, and prevent pre-travel emotional distress for domestic tourists. To further mitigate negative pre-

travel stimuli, DMOs can leverage AI-driven sentiment analysis and predictive analytics (Buhalis & Amaranggana, 2015), facilitating timely interventions that prevent escalating risks. Proactive digital engagement strategies, such as interactive feedback platforms, prompt responses to complaints, personalized communication, and targeted marketing campaigns, can effectively showcase service enhancements and reframe negative narratives. Such efforts help to restore trust and improve the destination's image among domestic tourists (Stokburger-Sauer & Hofmann, 2023).

Additionally, as anger and perceived betrayal amplify retaliatory behaviors such as boycotts and revenge (Ma et al., 2022; Shah et al., 2024; Su et al., 2022), tourism marketers might adopt emotionally intelligent communication frameworks to effectively manage grievances. This would include executing culturally sensitive messaging, empathetic recovery measures, and personalized compensation measures—including apologies, compensation, and compassionate communication (Freedman et al., 2017)—to reduce anger-driven retaliatory actions (Haj-Salem & Chebat, 2014; Su et al., 2022), particularly in collectivist cultures. Leveraging social media platforms to engage transparently with dissatisfied tourists and demonstrate corrective actions might help restore trust and defuse emotional triggers (Su et al., 2023). In Pakistan's domestic tourism context, where collectivist values amplify emotional responses, emotionally intelligent crisis handling helps to effectively diffuse anger, reinforce social bonds, and reduce the risk of boycotts and revenge behaviors. This approach ensures sustainable, resilient destination management practices.

Our findings highlight the dual role of relationship quality as both a mitigator and amplifier of emotional responses to service failures. Tourism marketers should enhance their relationship-focused marketing efforts to effectively handle these dynamics by offering personalized loyalty programs, exclusive benefits, and co-creation experiences (Zhao et al., 2024). Such initiatives would help to manage high-investment relationships, strengthen emotional ties, and encourage forgiveness against service failures (Tsarenko & Rooslani Tojib, 2011). Additionally, implementing dynamic service recovery models that acknowledge loyal customers' grievances and offer customized solutions can reinforce commitment and trust to reduce negative responses, even in crises (Lam & Wong, 2020). Such strategies are particularly valuable in domestic tourism markets, where emotional ties and cultural values heighten expectations and influence post-consumption behaviors.

To address dissatisfaction stemming from service failures, DMOs could integrate smart tourism technologies (Buhalis & Amaranggana, 2015) to allow real-time monitoring and support

systems to minimize emotional escalation. AI-powered tools for sentiment tracking and chatbots providing immediate assistance can detect early indications of dissatisfaction and swiftly resolve any issues. Moreover, VR-based training simulations for staff can enhance their preparedness to manage emotionally charged complaints, improving service delivery and decreasing the chance of negative emotional reactions (Rasouli et al., 2022). These technologies help DMOs bridge service gaps, optimize operations, and enhance overall visitor experiences while establishing long-term resilience against recurring service failures.

Finally, the findings emphasize cultural differences in service failure responses, particularly in emerging domestic tourism markets like Pakistan. These markets are characterized by collectivist values and high levels of emotional investment (Hofstede & McCrae, 2004), where tourists are more likely to perceive service failures as personal betrayals, resulting in revenge behaviors. To address these dynamics, tourism managers should develop culturally tailored service protocols that honor social norms and prioritize emotional reconciliation (Freedman et al., 2017). Additionally, community engagement programs can reinforce trust and cultural ties, thus diffusing negative emotions and preventing escalation. Moreover, adopting apology-based communication models can help repair reputational damage and restore social harmony (Wirtz & Mattila, 2004). Managers can also leverage narrative-based marketing and digital storytelling to align messages with cultural values and emotional expectations, counteracting negative impressions, reframing perceptions, and rebuilding brand equity. Collectively, these strategies support resilience-building and long-term sustainability in domestic tourism markets.

4.5.3 Limitations and future research

Despite offering several novel contributions, this study has limitations. First, we only focused on two emotions: betrayal and anger. However, given the complexity of tourists' responses to service failures, they may involve other emotions, such as frustration, empathy, optimism, or satisfaction. Future research should investigate these additional emotions and classify them by their degree of arousal. Second, the study employed a cross-sectional design, which limited its ability to capture temporal variations in emotions and behaviors. Future research could adopt a longitudinal design to explore the evolution of tourists' responses and evaluate differences in reactions at various stages of the travel experience. Third, although purposive sampling was appropriate for targeting participants with relevant experiences, its use limited the generalizability of findings. Future research should consider employing probability sampling techniques or broader sample populations to enhance representativeness and validity. Fourth, some of the study constructs' regression coefficients were small. Although they indicated

significant relationships, future research should examine psychological and behavioral outcomes with personality traits—such as extraversion, agreeableness, openness, conscientiousness, and neuroticism—as moderators. Understanding these traits will make it possible to develop strategies to reduce service failures.

Fifth, our results did not support some of our hypotheses regarding direct, indirect, and moderation effects. As such, we suggest that future researchers replicate the study quantitatively before validating it qualitatively, following a mixed-method sequential explanatory approach (Ma et al., 2022). Furthermore, future research could broaden the study's scope to encompass various sectors of the tourism industry, including ecotourism, adventure, animal, and urban tourism; this would enable an investigation of the consistency of findings across different contexts. Finally, although the study explored boycotts and revenge intentions, whether these intentions lead to actual behavior is unclear. Future research should investigate how these intentions transform into actual boycotts, as McKercher and Tse (2012) indicated. Incorporating experimental designs could help establish causality and yield deeper insights into behavioral patterns.

4.6 Conclusion

This study has provided a comprehensive theoretical framework that integrates emotional mediation, relationship quality moderation, and cultural influences to explain domestic tourists' psychological and behavioral responses to service failures. The study expands sensemaking theory by underscoring the cruciality of digital platforms in shaping pre-travel perceptions (i.e., ONDEs) and post-consumption behaviors. In doing so, it emphasizes that emotions, such as anger and betrayal, act as key mediators in driving boycott intentions, revenge behaviors, and reduced forbearance. Addressing the emotional and relational dynamics within domestic tourism, this research advances theoretical insights into the cultural and psychological mechanisms that underlie post-consumption behaviors, particularly in collectivist contexts where relational and emotional bonds are significant. These contributions provide a foundation for future research to explore emotional drivers, cultural variations, digital crisis management strategies, and relationship-focused marketing efforts within domestic tourism to mitigate negative experiences and promote resilience.

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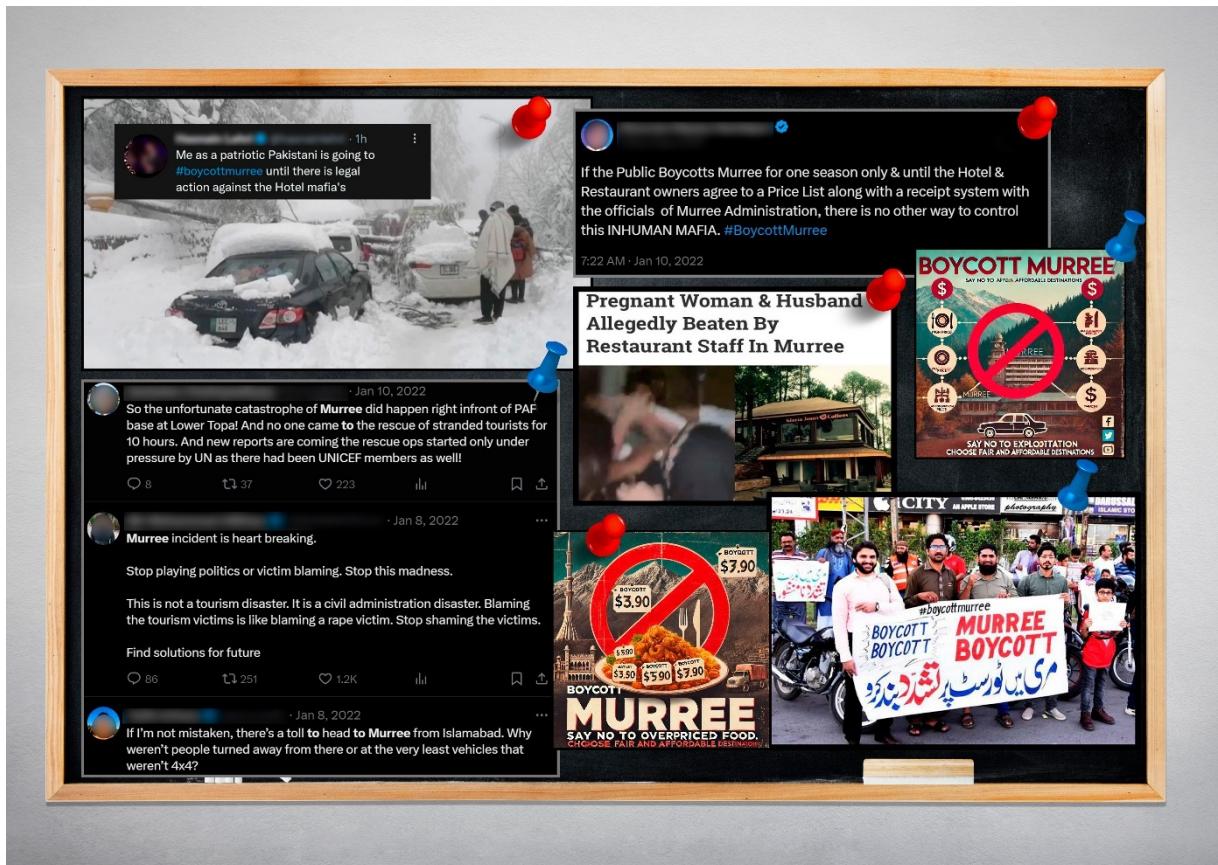
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Appendix Paper 4

Appendix A – Survey stimuli: Images of service failure discussions (eWOM)



Appendix B – Reliability and validity tests
Table A. Reliability and validity tests.

| Constructs with measuring items | Skewness | Kurtosis | Loadings | Cronbach's α | CR | AVE |
|--|----------|----------|----------|---------------------|-------|-------|
| Online negative destination experience (ONDEs) (Kim et al., 2021) | | | | 0.742 | 0.808 | 0.585 |
| Social media posts frequently indicate that restaurant owners at tourist destinations lack business ethics.* | | | 0.379 | | | |
| -0.454 | -0.555 | | | | | |
| Social media posts indicate that hotel rents at the tourist destination used to be too high. | | | 0.747 | | | |
| -0.970 ⁿⁿ | 0.320 | | | | | |
| Social media posts indicate that hotel rents at the tourist destination used to be affordable. ^{R, +} | | | | | | |
| 0.184 | -0.789 | | | | | |
| Social media posts indicate that food prices at the tourist destination used to be too high. | | | 0.833 | | | |
| -0.861 ⁿⁿ | 0.426 | | | | | |
| Social media posts indicate that hotel management at the tourist destination used to be rude. | | | 0.709 | | | |
| -0.241 | -0.415 | | | | | |
| Perceived betrayal (PB) (Su et al., 2022) | | | | 0.891 | 0.863 | 0.558 |
| I feel the people at the tourist destination cheated me. | | | 0.791 | | | |
| -0.200 | -0.717 | | | | | |
| I feel the people at the tourist destination betrayed me. | | | 0.792 | | | |
| -0.081 | -0.758 | | | | | |
| I feel the people at the tourist destination lied to me. | | | 0.755 | | | |
| -0.307 | -0.538 | | | | | |
| I feel the people at the tourist destination are going to take advantage of me. | | | 0.702 | | | |
| -0.258 | -0.674 | | | | | |
| I feel the people at the tourist destination abuse power. | | | 0.689 | | | |
| -0.446 | -0.317 | | | | | |
| Tourists' anger emotions (TAE) (Bonifield & Cole, 2007; Grégoire et al., 2010) | | | | 0.889 | 0.843 | 0.474 |
| The behavior of the service staff makes me feel annoyed.* | | | 0.564 | | | |
| -0.301 | -0.432 | | | | | |
| The behavior of the service staff makes me feel angry. | | | 0.603 | | | |
| -0.019 | -0.746 | | | | | |
| The policies of the local government at the destination make me feel irritated.* | | | 0.536 | | | |
| -0.279 | -0.376 | | | | | |
| The disrespect for human rights at the destination makes me feel outraged. | | | 0.744 | | | |
| -0.267 | -0.493 | | | | | |
| I dislike the destination because of past negative incidents. | | | 0.742 | | | |
| -0.259 | -0.486 | | | | | |
| I dislike the destination because of its history of oppressing other destinations. | | | 0.665 | | | |
| -0.078 | -0.500 | | | | | |
| I dislike the destination because it does not respect women's rights. | | | 0.681 | | | |
| -0.198 | -0.606 | | | | | |
| Generally, I have negative feelings toward this destination. | | | 0.685 | | | |
| -0.076 | -0.599 | | | | | |
| Destination boycott intention (DBI) (Su et al., 2022) | | | | 0.759 | 0.821 | 0.480 |
| I will temporarily choose a different tourist destination. | | | 0.767 | | | |
| -0.492 | -0.201 | | | | | |
| From now on, I will choose an alternative tourist destination. | | | 0.704 | | | |
| -0.363 | -0.371 | | | | | |
| I will temporarily stop going to the tourist destination. | | | 0.594 | | | |
| -0.196 | -0.625 | | | | | |

Table A (continued)

| | | | | | | |
|---|--------|--------|-------|-------|-------|-------|
| I will never again go to the tourist destination. | 0.232 | -0.599 | 0.733 | | | |
| I will take part in the boycott of the tourist destination. | -0.003 | -0.723 | 0.652 | | | |
| It will be difficult for me to take part in the boycott of the tourist destination. ^{R, †} | -0.196 | -0.447 | | 0.884 | 0.899 | 0.597 |
| Desire for revenge (DR) (Grégoire et al., 2010; Lee et al., 2013) | | | | | | |
| Indicate to which extent you want: | | | | | | |
| ...[to do something bad to this destination]. | 0.033 | -1.008 | 0.738 | | | |
| ...[to take actions to get this destination in trouble]. | 0.059 | -1.014 | 0.816 | | | |
| ...[to cause inconvenience to this destination]. | 0.245 | -0.959 | 0.811 | | | |
| ...[to punish this destination in some way]. | 0.043 | -1.066 | 0.755 | | | |
| ...[to make this destination get what it deserves]. | -0.060 | -0.821 | 0.743 | | | |
| ...[to get even with this destination]. | 0.135 | -0.775 | 0.767 | | | |
| Complaining behavior (CB) (Tosun et al., 2022) | | | | 0.753 | 0.845 | 0.646 |
| I would complain to destination managers to address negative experiences for better customer service. | | | 0.781 | | | |
| I would speak to my friends and relatives about my negative tourism experiences. | 0.175 | -0.667 | 0.821 | | | |
| I would share my negative tourism experiences on social media. | 0.153 | -0.611 | 0.808 | | | |
| Forbearance (FRB) (Ho & Liang, 2021) | | | | 0.720 | 0.777 | 0.469 |
| The negative information about the tourist destination did not change my view about it. | | | 0.751 | | | |
| I readily changed my view of the tourist destination based on the negative information about it. ^R | 0.226 | -0.945 | 0.594 | | | |
| The negative information about the tourist destination has no effect on me. | -0.167 | -0.835 | 0.776 | | | |
| The negative information about the tourist destination changed the way I think of it. ^R | 0.359 | -0.872 | 0.597 | | | |
| Relationship quality (RQ) (Su et al., 2022). | -0.450 | -0.641 | | 0.735 | 0.817 | 0.599 |
| I feel the tourist destination is very undependable. ^{R, †} | -0.198 | -0.297 | | | | |
| I am satisfied with the relationship I have with the tourist destination. | -0.121 | -0.389 | 0.720 | | | |
| The relationship with the tourist destination is something I am very committed to. | -0.288 | -0.117 | 0.808 | | | |
| I feel a sense of belonging to the tourist destination. | -0.275 | -0.329 | 0.792 | | | |

Notes: composite reliability (CR), average variance extracted (AVE)

^R Reverse items

ⁿⁿ not normal item

[†] item dropped due to low Cronbach's alpha

^{*} item dropped due to low factor loadings

5 P5. Urban Transport Systems Change

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Abstract

Many cities seek to change their transport systems to reduce negative outcomes. This generally involves measures supporting active and public transport, restricting vehicle use. Infrastructure modification and legislative developments are often perceived as ‘attacks’, and lead to resistance by specific groups. This paper uses critical discourse analysis to evaluate a convenience sample of 185 social media threads opposing Ultra-Low Emission Zones (ULEZ), Clean Air Zones (CAZ), and Low Traffic Neighbourhoods (LTN) in four cities in the UK, Oxford, London, Birmingham, and Bradford. Themes are identified through MaxQDA to determine the range of discursive strategies used, as well as to understand their interrelationships. Findings highlight intersections of populist politics and (sustainable) transport policymaking and planning in UK cities. The understanding of the mechanisms at work can facilitate the development of less divisive strategies for transforming urban transport systems.

Keywords: air pollution; Clean Air Zones; Discourse Analysis; Low traffic neighbourhood; Populism; Ultra-low emission zones

Citation:

Gössling, S., Schweiggart, N., Nieuwenhuijsen, M., McEachan, R. R. C., & Khreis, H. (2024). Urban transport system changes in the UK: In danger of populism?. *Cities*, 153, 105273.

5.1. Introduction

Transport systems remain a barrier to climate change mitigation and clean air (de Blas et al., 2020; Mueller et al., 2020; Nieuwenhuijsen, 2021). Cities are often at the forefront of efforts to reduce emissions and pollutants. Strategies include the promotion of active transportation and public transport, sometimes in tandem with limitations on private vehicle use. For example, cities have implemented play streets, speed limits, cycling infrastructure, and ultra-low emission zones. However, any infrastructure change may be seen as ‘disadvantaging’ vehicle use and can become an arena for heated political debate (Griggs & Howarth, 2008) that ultimately pertains to the spatiality of the city and ideas of spatial justice (Soja, 2013).

Transport politics are an easy target for populists because of their largely technical, abstract, and ‘elite-driven’ nature (Huber, 2020). In recent years, populist parties have gained support in Europe and elsewhere (Müller et al., 2017; Waisbord, 2013). Populist views increasingly lead to social divide (Ginsburgh et al., 2021), in which climate policies feature prominently as a theme (Huber et al., 2020). This has polarized society at local, national and international levels, fueling populist discourse across Europe, North America and in other regions (Fraune & Knodt, 2018; Lockwood, 2018).

Environmental debates are often highly polarized (Wanvik & Haarstad, 2021). Differences become obvious between liberal, left-leaning urbanities and more conservative, right-leaning suburban dwellers (Wanvik & Haarstad, 2021). Typically, populist movements have framed green policies as a conflict between ‘the people’ and ‘the elite’, thereby challenging their validity (Wanvik & Haarstad, 2021), as well as the science behind these policies. Supporting this framing is the potential increased cost or inconvenience for vehicle users. In the context of urban transport planning, populist movements, often fueled by disappointment with the current political system (Huber, 2020), have emerged in opposition to measures such as road tolls, congestion charging, car-free zones, or fuel subsidy removal (Wanvik & Haarstad, 2021). There is thus evidence that urban contexts increasingly serve as arenas in which populist politics are playing out through sustainable transport policies.

Populist conservative movements have often been successful in dismantling environmental laws and regulation (Mostafavi et al., 2022; see also Henderson & Gulsrud, 2019). For instance, the “Yellow Vest” movement in France and Belgium was triggered by a fuel tax hike that subsequently turned into opposition to Emmanuel Macron’s climate agenda (Kinniburgh, 2019). In Norway, the populist “Enough is Enough” (“Nok er Nok”) movement, prominent in the lead-up to the 2019 municipal elections in the city of Bergen, successfully advocated for

the removal of toll road stations. It framed green governance as an agenda of ‘elite’ politicians “out of touch with ‘the people’” (Wanvik & Haarstad, 2021, p. 2097). In January 2024, Farmers in Germany blocked roads throughout the country to protest reductions in fossil fuel subsidies; this caused the government to change its planned policies (Monbiot, 2023). The examples illustrate that ‘resistance’ can be successful in overturning policies, showing that populism can be a driver of opposition, but also represent a practice of opposition.

The understanding of the workings and effects of populism, as well as the associated phenomenon of societal polarization, is arguably vital for the continuation of urban transport system change (UTSC) initiatives. Thus, the purpose of this paper is to examine and analyze debates of UTSC related to improvements in air quality and active travel, and to describe and evaluate the discursive strategies used. Focus is on the UK, where recent introductions of transportation demand management (TDM) policies (CAZ, ULEZ and LTN) have caused conflicts. Based on a critical analysis of social media accounts, the paper investigates the discourses created by opponents to UTSC, their character, as well as their discursive relations, addressing the following research question: “Which discursive strategies are used to oppose UTSC initiatives and which relevance do they have for transport demand management policies and planning?” Findings are used to discuss the importance of measures and communicative strategies that seek to understand opposition, also as a populism practice, and thus help reducing UTSC resistance.

5.2 Literature review

5.2.1 Urban transport system change

Transport planners in cities of various size and form have introduced measures to support active forms of transport or to restrict vehicle-based transport (Ward et al., 2021), with a view to desirable social, environmental and public health outcomes. Policies have the purpose of addressing external costs, or to increase well-being. Changes usually disadvantage vehicles, and in particular the private car, as space is reallocated to accommodate cycle tracks, play streets, or car-free zones, while speed limits are lowered to mitigate air pollution, noise, and injury risks. Restrictions can be imposed for different reasons, to reduce vehicle numbers, or to increase pressure on polluting, loud, or large vehicles; and take various forms, such as bonus/malus systems, congestion charges, or ultra-low emission zones (Habibi et al., 2019; Ma et al., 2021; West & Borjesson, 2020). In some countries, it is also common to charge vehicle users for infrastructure use (highway charges, bridge, or tunnel fees) (Duncan et al., 2020).

Cities are characterized by specific structures that determine how UTSC measures affect different transport mode users. This is captured in the spatiality of cities, a multifaceted concept that involves an understanding as to how physical layout, social structures, and economic systems within urban environments interact and influence each other. For instance, Robinson (2011: 1) distinguishes “wealthier and poorer, capitalist and socialist” cities. Central to urban spatiality is the idea of spatial justice, i.e., the equitable distribution of resources and opportunities across different urban areas (Soja, 2013). The configuration of urban space directly impacts social interactions and accessibility of services, which may increase (or decrease) social inequalities (Lefebvre, 1991).

UTSC is usually framed as a response to pressures, such as growing congestion or high levels of air pollution. Cities strive to enhance quality of life and well-being, supported by substantial evidence indicating that urban green spaces and active mobility contribute positively to physical and mental health (Mueller et al., 2020; Nieuwenhuijsen, 2021). Furthermore, urban planning initiatives aim to mitigate climate change and adapt to the challenges posed by it. For instance, the rising frequency and intensity of heat waves can be mitigated, in part, by an augmentation of urban green spaces (Wong et al., 2021). There are also issues of congestion and safety, all related to welfare and well-being. In general terms, this represents a situation in which pressures lead to the conclusion, grounded in rational argument, that reductions in urban vehicle traffic are desirable, necessary, or even unavoidable. In world cities such as Barcelona, Madrid, Copenhagen, London, or Paris, this has seen initiatives restricting vehicles, specifically the private car (Lebrusan & Toutouh, 2021; Mueller et al., 2020). UTSC designs have usually been successful in reducing negative externalities, though benefits of specific policies may be small (Ma et al., 2021) and nuanced, depending on measurement instrument and the externality’s proxy (Glazener et al., 2022).

Scientific perspectives on the transformation of urban transport systems are nevertheless often met with resistance from groups perceiving themselves to be disadvantaged. Opposition can take very different forms, from social media campaigns to vandalized infrastructure, and political leaders on UTSC have found themselves to be at the center of efforts to oust them from office. These efforts often seem to be personal attacks, embedded in emotional claims. In Paris, Mayor Anne Hildago quit the social media platform X over onslaughts on her urban policies, arguing that the site manipulated and disinforming: “Twitter [...] has in recent years become an impressive tool for destroying our democracies” (Reuters, 2023, no page). In London, mayor Sadiq Khan defended ultra-low emission zones over scientific evidence of 4000 premature deaths per year in the city, blaming criticism on oppositional party ideology: “That’s why they

are desperate to concoct a bogus war on the motorist. Division is both their strategy and overriding priority" (Badshah, 2023, no page). The examples illustrate how populist discourse is interacting with sustainable transport policies within the spatiality of cities.

5.2.2 Populism and polarization

Many European liberal democracies have seen a recent rise in populism and growing political polarization. Mudde (2004, p. 543) defined populism as "an ideology that considers society to be ultimately separated into two homogeneous and antagonistic groups, 'the pure people' versus 'the corrupt elite'". By implication, 'elite politics' do not represent majority views or interests (Wirth et al., 2016), and hence allow for the moral distinction of 'good people' pitched against an 'evil elite' (Hawkins & Kaltwasser, 2018). The 'elite' are characterized by higher academic education or socioeconomic status, and, as a group, use political power and public resources to their advantage (Remme et al., 2022).

Populist discourse uses forms of dispositional blame attribution (Busby et al., 2019) that can be based on highly emotional and simplistic arguments (Mudde, 2004, p. 542), polemics of victimization, and moralization over rational discourse (Olivas Osuna, 2021). Populist debates can invoke "nefarious minorities" (Ostiguy & Casullo, 2017), viewed as the source of corruption of elites and drawing away their attention from the "deserving" but neglected people. Populism offers simplified worldviews, specifically regarding the structures of power in society. 'The people' are seen as the rightful authority (Mudde, 2004), and populist discourse is invariably in the name of 'the people', 'the nation' or 'the local community' – discursively seeking to unite around shared values and beliefs (Griggs & Howarth, 2008). Strong preferences for 'law and order' are also associated with populism, while institutions are distrusted (Ginsburgh et al., 2021). The media has been important to communicate ideas (Engesser et al., 2017; Prior, 2013; Schulze et al., 2020), though social media platforms have more recently taken over the role of echo chambers (Urbinati, 2019).

While populism and polarization are two distinct concepts, they can be mutually self-reinforcing and share similar characteristics (e.g., extreme positions, lack of middle ground, emotional appeals). Polarization is related to populist attitudes (Ginsburgh et al., 2021), and refers to the process by which opinions, beliefs, or groups become divided into extreme or opposing positions. In political contexts, polarization often involves distinct and contrasting views, leading to a sharp divide between different political camps that again is the basis for populist "them vs. us" narratives. Root causes for societal division are seen in the increasing cost of living, job insecurity, and income disparities (Ginsburgh et al., 2021). Populism and

polarization affect democratic stability (Inglehart & Norris, 2017; McCoy & Somer, 2019), with some scholars highlighting signs of democratic regression (Lührmann et al., 2019) that also undermines progress on environmental goals (Mostafavi et al., 2022; Wanvik & Haarstad, 2021).

Even though the focus is here on populism, it is important to acknowledge that populism is not in itself an all-encompassing explanation of opposition to UTSC. As the literature on congestion pricing shows, reasons for opposition vary, depend on values and beliefs, and change over time; addressing issues of fairness, dedication of revenues to specific purposes, incentives, or beliefs in benefits will increase acceptance (Borjesson et al., 2016; Cohen-Blankshtain et al., 2023; Eliasson, 2014; Harrington et al., 2001; Hårsman & Quigley, 2010; Selmoune et al., 2020). The discussion for this returns to underlying factors, such as symbolic and affective vehicle values (Steg, 2005), to provide a deeper analytical foundation for interventions.

5.3 Materials and methods

The aim of a critical discourse analysis (CDA) is to study “text in context” (Van Dijk, 1993, p. 96) and to provide a “systematic theoretical and descriptive account of the structures and strategies, at various levels, of written and spoken discourse”. This also includes relationships between texts and their interactions with “the relevant structures of their cognitive, social, cultural, and historical contexts” (*ibid.*). In doing so, the analysis moves beyond language and also investigates the social and political contexts and roles at play, depicting the attitudes and behaviors of key actors (Hickman & Hannigan, 2023). Through discourse analysis, multiple and competing narratives can be uncovered (Sharp & Richardson, 2001) and reveal how language is used to pursue political objectives and how policies are interpreted by their intended audience (Jacobs, 2006).

Discourse analysis has importance for transport and urban planning (Hickman & Hannigan, 2023; for examples see Haikola & Anshelm, 2023; Jensen et al., 2020; Mown & Bailey, 2022; and Smith, 2016), because diverse interest groups seek to establish specific narratives to achieve political goals (Jacobs, 2006). The understanding of discourses and their subjectivities can help the analysis of differences in viewpoints and interests (Hickman & Hannigan, 2023). These can include those of policymakers, other political actors, media and public, or residents. Focus of this paper is on the views expressed by individuals on social media with the goal of opposing UTSC.

Studies of TDM policies such as ULEZ, CAZ and LTN must be local, as these policies are not implemented nationwide. The UK is currently at the forefront of UTSC efforts, as different TDM policies are implemented in its cities. For this explorative paper, focus is on Ultra Low Emission Zones (ULEZ; Greater London), Clean Air Zones (CAZ; Bradford, Birmingham), and Low Traffic Neighbourhoods (LTN; London, Oxford), i.e. cities that vary in size, population, and structure. For details on ULEZ, CAZ and LTN see also Ding et al. (2023), Ma et al. (2021), McEachan et al. (2022).

TDM policies in these cities have in common that they are unpopular because they change the transport system status quo and restrict behavior (e.g. Lattarulo et al., 2019). The analysis is however not limited to these efforts, it also touches upon other approaches to UTSC, such as the 15-minute-city, which is mentioned in several of the threads included in this study.

To analyze a diverse sample of current communications (text identification), the decision was made to focus on social media, including Reddit and X. A sample of threads was collected and assembled in September 2023, in a deliberate attempt to gather a diverse material. This also included keywords and hashtags (#waroncars, #ULEZ, #LTNs, #BradfordCAZ), as well as a screening of the “Top Tweets” panel on X. It remains unclear if any of the tweets were posted by bots; however, both real and bot accounts contribute to populism. The material is not exhaustive, as the study had no goal of theoretical saturation (Glaser & Strauss, 2017), and thus needs to be considered explorative. For analysis, 185 threads were combined in one Word document, comprising 75 pages of text with 46 photographs. For purposes of definition, a thread consists of individual comments or viewpoints on a specific aspect of UTSC. Threads have been mostly posted by individuals (> 90 % of the material), rather than institutions or agencies. Of the usernames reappearing in the material (n = 10, with three or more posts), six reach out to >1000 followers. Consequently, the analysis does not allow for conclusions regarding the users of social media platforms or the recipients of information.

MaxQDA (Kuckartz & Radiker, 2019; Oswald, 2019) is an established tool for conducting discourse analyses (Leimbigler, 2021) and was used to derive themes that represent exposing, framing, or discursive strategies. Comments were coded based on an inductive approach, i.e. an *in vivo* development of codes (themes). Codes were assigned both to whole entities (i.e., posts), text passages and single words. Memos and comments were added where necessary for the interpretation of the text. The analysis uses Fairclough’s (2013) three-dimensional framework for discourse analysis, including (1) text analysis – the structure of text, vocabulary and grammar cohesion, (2) discursive practice – the analysis of the processes in which

statements are made and feed into other debates, and (3) social practice – a study of discourse in relation to wider power structures and ideology.

The unit of analysis is consequently a specific type of discourse, or a repeated theme, rather than the author or organization behind the comments (Guiver, 2007). It is assumed that authors are “competent language users” who deliberately select language which supports and justifies their own actions and beliefs. The aim of the discourse analysis is to identify prevalent discourses and examine their implication. Quotes are included for illustration. Since these quotes are extracted from spoken language, they may contain disjointed language, can be grammatically incorrect or contain explicit language and swearing.

The analysis of the threads leads to the identification of 12 themes, i. e. the content around which discourses are organized. These are presented in the following under specific labels that reflect on content (thematic summaries; see Kuckartz & Radiker, 2019). Themes are often interrelated, and the quotes will thus often substantiate more than one theme. Cross references between themes have for this reason been included. Linkages between themes are illustrated through a cooccurrence analysis that measures overlap and distance of the coded elements (Leimbägler, 2021). In the Results section, themes are organized in ‘hierarchical’ order, following escalation stages from factually argued viewpoints to emotional calls for violence. It is acknowledged that there are other ways of organizing the themes; here, escalation stages are considered suitable given the paper’s focus on populism and societal polarization outcomes. The presentation of the themes outlines linkages and includes a theoretical embedding where appropriate.

5.4 Results

Findings suggest that various discursive strategies are used to create, maintain, or enhance opposition to UTSC and TDM policies. These strategies are interlinked and can be organized as escalation stages (Table 24). The following sections provide thematic summaries that illustrate the content around which discourses are organized.

Table 24. Themes and main message quotes

| Theme | Main message quotes |
|----------------------------|--|
| 1. Alternative facts | “Bradford doesn’t have an air pollution problem.” |
| 2. Reversal of causalities | “LTNs [...] have proven time and time again to increase congestion/pollution”. |
| 3. Sidelining UTSC | “What about stopping child grooming gangs.” |

Table 24 (continued)

| | |
|---|---|
| 4. Self-victimization | “Absolutely shameful. The true face of @UKLabour making the poor poorer...#labourhypocrisy #ulezexpansion.” |
| 5. Deep values | “We'll now have schools without teachers and roads without shops” |
| 6. Language | “ANOTHER VANITY PROJECT.” |
| 7. Mock indignation | “The AUDACITY!!!!” |
| 8. Ripping off taxpayers | “[...] a money making scheme by introducing CAZ”. |
| 9. The evil state | “We live in a #Stasi state [...]” |
| 10. Resistance | “When is it acceptable for people to rebel against government overreach? When is it allowable for citizens to tear down the symbols of an authoritarian state?” |
| 11. Shame labeling | “you are shameful.” (addressed at a member of the County Council) |
| 12. Endorsement and encouragement of violence | “RIP THEM ALL DOWN.” |

A prominent strategy encountered in threads and texts is to negate rational or scientific findings and arguments, i.e. to establish *alternative facts* (theme 1). Facts are dismissed, and alternative interpretations presented, here in regard to (1) necessity and effectiveness, (2) disruptiveness, (3) health hazards, and (4) welfare losses. Claims (1) can be broad: “It is clear to see for all that they [LNTs] do not work”, and involve “substantiation” by “experts”: “[Name, title] stressed that there is not enough data about pedestrian traffic deaths to understand the causes...”. Challenges to the policies’ disruptive character (2) insinuates that motorized traffic is displaced and public transport slowed down: “Oxford low traffic neighbourhoods make bus journeys slower than walking”. The disrupted transport system thus causes health hazards (3): “Lewisham is gridlocked, asthma rates up.” Welfare losses (4) are invoked: “I bet the City loses more \$ in lost property valuation taxes than it’s worth”, “[c]ycling infrastructure is usually a waste of money”. The theme is linked to reversed causalities (see theme 2), and can be accompanied by calls for “evidence” – a meme that has its own X-hashtag (“#DemandEvidence”) –, or demands for “truth”: “@BBCLondonNews @BBCNews @LBC @cristo_radio... @thetimes @guardian - Isn’t it time that media outlets & papers told the truth?”

A related theme is the reversal of causalities (theme 2), “We all know that it is #cyclists, and cyclists alone, who cause congestion.”, and that drivers will be exposed to pollution if using other transport modes: “[...] if displacement of motorists to the underground occurs, those people are at risk from poor air quality on that form of transport”. Cycling is dismissed, because

it imposes risks on others: “[...] pavement cycling is so common now that many elderly folk walk less as it is so dangerous”. Another claim is that motorists are overcharged in ULEZ, an argument that is also found in the context of fuel taxation or parking: “PER DAY...#ULEZ £12.50 CONgestion Charge £15.00 ...”.

Another discourse seeks to sideline UTSC (theme 3), i.e. to establish that other societal challenges should have higher priority, a mechanism also described as “whataboutism” (Dykstra, 2020). Sidelining is usually based on comparison. For example, “Poor people paying CAZ charges when all this firework pollution [...]” suggests that Clean Air Zones (CAZ) are established at the expense of low-income earners (see also theme 4), while addressing other sources of pollutants should have priority. Comparison can involve literally any issue, as Ultra-Low Emission Zone (ULEZ) discussions in London illustrate: “More money invested in #ULEZ than policing”, and even invoke personal responsibility for pollution: “[...] whilst his busses are major polluters” in reference to London’s mayor.

Drivers often present themselves as victims of transport policies (theme 4) who are treated unfairly. This can also involve generic reference to “the poor”. Many of these discourses are linked to “big government” “robbing” the “working man”, who “[...] put the people [...] out of business and into poverty”. Views also invoke unfairness: “Over 400,000 foreign drivers avoid #ULEZ fines”; “It will force us onto one of the already busiest roads in the UK and means hours more in the car every week”.

Various threads use a strategy of deep value construction (theme 5), linking UTSC to threats against family, older citizens, disabled citizens, education, health, access, and (small) businesses: “I heard about businesses closing and family life being devastated”, (see also theme 6, constructive language). Numerous other quotes invoke family values: “[...] is a disaster for our young family...”; “#ULEZ is isolating the most vulnerable in our society and disconnecting our families.”. The theme is powerful, because it touches upon the central human value, i.e. biological family. In some cases, such as “[...] declared War on Family Visits”, this is discursively reinforced. Notably, a declaration of war justifies the staging of a defense, and potentially even violence directed at an aggressor. Freedom is another deep value in Western society. Here, comments distort. For example, the 15-minute city, designed to be accessible for everybody without access to a private car, is framed as: “15 min city = prison ‘cell’ = ghetto”. Again, language (theme 6) is of importance, as the term ‘ghetto’ is associated with German atrocities during WWII. More common is the word ‘prison’: “It starts as a walkable city. Then slowly they turn into zones that you aren’t allowed to leave. Then it becomes prison”. Claims

can have the character of conspiracy theories: “Cities that are being converted into 15-minute Smart Cities (prison) run by A.I. You better check to see if your city is listed. If not, it will be. This is going worldwide”; “This is what China’s 15 minute cities looks like. A place where you have to scan your QR code COVID passport and your face recognition to get in or out. Dystopian hell.” Deep value discourses also involve statistics of unknown origin: “[...] monitoring shows we’ve had 8–13 % MORE most polluting HGV’s [heavy good vehicles] past since CAZ. LTN’s will push more pollution here. Past homes, multiple schools, hospitals, elder homes, shops, businesses & where kids walk & get buses”.

Language (theme 6) refers to the form in which opinion is expressed. Comments can be emotional, accusing, aggressive, violent, even invoking death: “Bradford my home town is dead to me”; “You’ve destroyed our city”. In other contexts, the tone is insulting, describing policymakers as “robbing twats”, “rest of the scum labour MPs [members of parliament]”, “scumbags”, or “lobbyist puppetmasters” (see also theme 11). Language can also incur oppression: “They love creating these GHETTOs” (as discussed in theme 5), and there is a hashtag “war on cars”, described as “an all-out war against the motorist is in full swing”. Such “despotic decision [...] to force the hated #LTNs [into society]” can lead to calls for insurgence: “The fightback and backlash from this despotic decision [...] has only started. There will be full force opposition until there is absolute local authority capitulation”. Language can also be about textual form (see also theme 7), i.e. the use of capital letters and exclamation marks to add emphasis, or to reflect on the emotional state of the writer; for instance, to convey anger: “Your CAZ charge is a bloody scam !!”.

Mock indignation (theme 7) is another strategy that is related to language (theme 6), though here with the purpose of dismissing UTSC as altogether unworthy of rational consideration. Comments express disbelief and incredulity, often in capital letters to underline the emotional character of the post: “#RIDICULOUS POLICY!!” There can be ridicule and sarcasm: “[...] love this piece of ‘reasoning’ [...] [laughing emoji]”, also by posting photographs in which setbacks to UTSC are celebrated. An example is a burning electric bus, drawing ridicule for causing “bad air”.

Comments infer that restrictions serve the goal of earning money to government, ripping off taxpayers (theme 9): “Don’t wanna give my money to a council with a stupid get rich quick scheme.”; “cash cow opportunity”. This can lead to the conclusion that policymakers are corrupt: “These new taxes in the poorest drivers are morally corrupt.”; “@lambeth_council = where corruption never sleeps”.

The *evil state* (theme 9) is underfed by the idea of “hardworking people” battling “the system”. This discourse paints a morally just struggle aimed at re-establishing democracy (“#DemandDemocracy”). No historical comparison is too grand to serve as a metaphor for the scale of this struggle: “But it’s all for your own safety they keep telling us as they take away our freedom of speech freedom of movement and all the other freedoms our grandparents and great grandparents fought so hard for in 2 World Wars”; “People were cheered for tearing down the Berlin Wall - but touch an #ULEZ camera, and you’ll end up in the clink”. In this view, government is evil, and policymakers criminal or worse: “Still think #WEF TERRORIST @Sadiq Khan is working for Londoner’s instead of his @C40Cities + WEF TERRORIST MATES?”.

Various themes motivate resistance to UTSC (theme 10). Comments portray a common enemy – the evil state and its representatives – against whom opposition needs to be built. Strategies can involve the sharing of injustices online, as well as donations for the common cause: “Share how the #ULEZExpansion has impacted your family and loved ones”, “[Go-fund-me link] If you can afford it donate a day’s charge or an hour pay. Whatever you can afford!”. Readers are encouraged to follow specific hashtags (“Keep fighting #CAZ and #ULEZ”). Resistance in this line of argument sometimes supports democratic form as potential majorities can reverse policies: “There is only one solution now. In May he has to go”; “#Ulezexpansion will end as long as you make the right choice. ANY other vote is a vote for sadiq khan”. Statements can also be ominous: “There’s going to be a backlash.”; “The fightback and backlash from this despotic decision [...] has only started. There will be full force opposition until there is absolute local authority capitulation”.

A common strategy to reduce an opponent’s credibility is to shamelabel the person (theme 11). In the threads analyzed, shame-labelling is evident in the nouns and attributes used (“hypocrite”; “cretinous”), as well as in specific form (“This man needs to be put on the spot for ruining #Oxford”) (followed by photo of a member of County Council). Shamelabeling also dehumanizes “[...] the scum labour mps”, as it infers that a person has a lower value to society because of specific character traits. This lowers moral barriers to attack the person and to justify violence.

The last escalation step endorses violence (theme 12). Technical infrastructure, such as surveillance cameras in ULEZ zones, are the most prominent feature against which violence is

encouraged. For example, “Blade Runners”⁵, are a loose movement of vigilantes vandalizing or stealing surveillance cameras. In November 2023, the London Metropolitan Police reported 987 ULEZ cameras as stolen or damaged (Met, 2023). YouTube clips showing Blade Runners in action are widely available on the Internet and are described as “heroes” and “Robin Hoods”. Organized through social media groups, Blade Runners have crowdsourced maps of camera locations. Comments read: “If only a #bladerunner were here”; “Every #ULEZ camera [...] is there to make you a better marksman. How good are you [...]?” A specific aspect of ULEZ vandalism is that the resistance to the scheme morally normalizes violence and that ULEZ cameras need to be destroyed: “Anti-ULEZ activists are planning to destroy 8 out of 10 cameras in the next four weeks. They have exciting plans that will bring the pollution charge scheme to its knees. NO TO #ULEZExpansion NO TO #RoadUserCharging”. Verbal expressions of support are often interlinked with visualizations, such as pictograms endorsing camera damage: “795 #ULEZ cameras were damaged or stolen in #London between April and September” (followed by flexed-biceps emoji), as well as images, in which predominantly male individuals are photographed or filmed during “raids”. Perpetrators always wear ski masks to render impossible face-recognition, creating the impression of an insurgency: “We must fight the power and crush the imposition of hated, unwanted and unwarranted #LTNs”.

Further MaxQDA co-occurrence analysis shows that alternative facts (theme 1) and deep values (theme 5) represent central nodes in the discourse, branching out to ripping of taxpayers (theme 8), resistance (theme 10), and language (theme 6) (Fig. 21). The most problematic theme, endorsement of violence, is most closely linked to evil state (theme 9) and language (6). Even though the work presented in this paper is based on four cities and a limited number of posts, data suggests that some themes appear more frequently than others (Table 25). Posts questioning facts (theme 1) as well as presenting UTSC measures as designs to rip off vehicle owners (theme 8) dominate, followed by posts addressing deep values and fears (theme 5). These also appear frequently in tandem, as shown in the overlap of themes. For example, themes 5 and 8 are often used in the context of alternative facts, and theme 8 also coexists with victimization and language. While it needs to be confirmed that the pattern is robust, this may indicate that these themes reverberate particularly well with followers.

⁵ The movement is named after the 1982 sci-fi, dystopian film “Blade Runner” where “Blade Runners” are special agents assigned to hunt down escaped (illegal) “replicants”.

5.5 Discussion

The case study of four different cities in the UK has sought to address the question of discursive strategies used to oppose UTSC initiatives. Twelve different themes were identified in posts and comments that provide content for discourses positing that TDM policies are misguided and further disadvantage already vulnerable population groups (Figure 21). Political linguistic research confirms that these themes are regularly employed in populist discourse, including an amalgam of emotions, fears, self-victimization, reversal of causalities, anti-elite sentiments, shaming, and humor (Kelly, 2019; Ott & Dickinson, 2019; Al-Ghazzi, 2021; Sakki & Martikainen, 2021).

Discourses serve different functions. Emotionally charged discourse exploits fears and is a catalyst for populism (Ott & Dickinson, 2019). Affective exaggerations as well as the dismissal of ‘adversary’ arguments represent a departure from the political norm (Stuckey, 2017), and are a means of establishing ‘virtue-based’ justifications for views and actions that are founded in moral superiority over rival parties (Vahter & Jakobson, 2023). Self-victimization plays a crucial role in achieving this, as noted by Al-Ghazzi (2021), while the reversal of logic undermines the identification of common ground in scientific facts (Blassnig et al., 2019).

In tandem with notion of an evil state, populist discourse creates a notion of structural oppression, fostering a sense of vulnerability (Johnson, 2019). This sentiment is reinforced by a vilification of elites and attribution of societal problems to their influence (Pérez-Curiel, 2021). ‘Hardships’ resulting out of ‘elite’ policies absolve of culpability (Kelly, 2019; Neerdaels et al., 2023), and justify opposition and resistance.

Shaming has a critical role in public humiliation and critique of adversaries (Jacobs et al., 2020), and shame-labelling, as well as language that dismisses ‘elites’ (transport planners, politicians) is system delegitimizing, contributing to perceptions of democracy deficit (McCoy & Somer, 2019; Tworzecki, 2019). Public humiliation also represents a departure from established policy norms, again complicating the finding of a consensus based on collaboration and dialogue (Homolar & Lofflmann, 2023). Humor – in this study also involving ridicule – is a means of cultivating anger and polarization, while reinforcing a sense of moral superiority and divisiveness (Sakki & Martikainen, 2021).

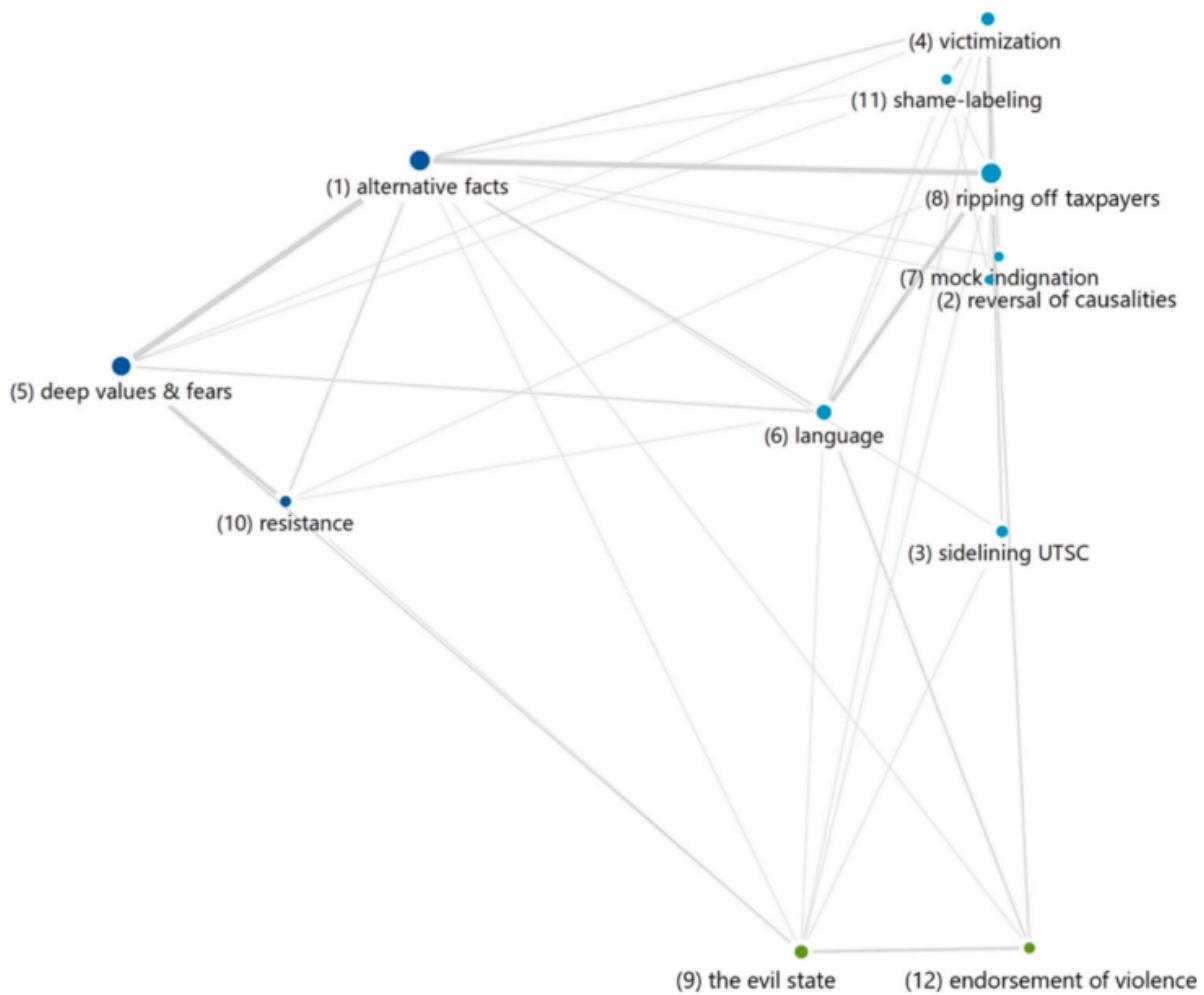


Figure 21. Discursive strategy connections.

Note. Line thickness indicates the frequency of shared discourse. Colors signify clusters. MaxQDA distinguished three theme clusters based on their geodesic distance.

Findings suggest that UTSC has become an arena where populism, as a driver of opposition and as a practice, play out through sustainable transport policies. While these findings pertain to the cities studied, and their specific spatialities, they may nevertheless have relevance for other urban contexts (Robinson, 2011). Populism, i.e. the expression of opinion in aggressive form that delegitimizes opponents, is a threat for democracy, specifically when these are dismissive or question democratically legitimized policies with established social welfare gains (McCoy & Somer, 2019). Hence, notions that populism should be “considered inherent to the transformation process” (Wanvik & Haarstad, 2021, p. 2096) are problematic if considering findings that the urban-rural divide is growing (Jennings & Stoker, 2018; RodríguezPose, 2018) and that TDM policies can also lead to division in the communities where they are implemented. To limit polarization of opinion should thus be a priority in transport planning and politics;

specifically since this study indicates that UTSC can have such relevance that they eclipse other political matters.

Here, spatial justice can serve as a starting point (Soja, 2013). Reasons for resistance to UTSC are usually considered social justice and equity related (Remme et al., 2022; Wågsæther et al., 2022; see also Cohen-Blankshtain et al., 2023). The car is a transport mode on which people depend in the absence of alternatives, also as a result of car-centric transport policies (Hrelja & Rye, 2023). The car also has symbolic and affective values (Steg, 2005) that may, depending on context and situation, outweigh its instrumental functions (Gössling, 2017). Drivers also develop co-identities with their vehicles, and TDM policies may be perceived identity threats (Murtagh et al., 2012). Opposition to UTSC may consequently be multi-dimensional, as evident from the complex, multifaceted discourses identified in this research.

Table 25. Frequency of themes.

| Theme | Frequency |
|------------------------------|-----------|
| (1) Alternative facts | 34 |
| (2) Reversal of causalities | 7 |
| (3) Sidelining UTSC | 13 |
| (4) Victimization | 17 |
| (5) Deep values | 31 |
| (6) Language | 21 |
| (7) Mock indignation | 8 |
| (8) Ripping off | 33 |
| (9) The evil state | 18 |
| (10) Resistance | 12 |
| (11) Shame-labeling | 10 |
| (12) Endorsement of violence | 12 |

Findings have relevance for the future of UTSC. A starting point is to acknowledge that UTSC measures have potentially grave financial implications for low-income groups and may disproportionately affect rural and sub-urban populations (Wanvik & Haarstad, 2021). There is some support for notions that green policies often benefit the more affluent and educated population in urban centers (Anfinsen, 2021; Remme et al., 2022; Wanvik & Haarstad, 2021), while disadvantaging those who may have been forced out of cities because of rising housing costs (Mattioli, 2014; see also Currie & Delbosc, 2011).

This suggests that resistance to UTSC should not be dismissed as a mere nuisance to public order, that transport alternatives need to be offered, and that emotions may reflect on instrumental, symbolic and affective vehicle values endangered by TDM policies. In reflection of the escalation stages identified in this research, policies should be designed with a view to accommodating disadvantaged populations, and with a framing in appropriate communication strategies (van Wee, 2023). For example, it has been suggested that geographically differentiated pricing models can shield vulnerable groups (Creutzig et al., 2020). Even more successful may be strategies that engage with change from the top by targeting those social groups contributing disproportionately to a problem. For example, charges for SUV, based on the argument that these reduce visibility in traffic, require greater shares of scarce parking, or cause more severe injuries, will reverberate with broader populations. Likewise, measures designed to make ways to school safer for children or for elderly people using sidewalks will be perceived as supportive of vulnerable groups.

This underlines the important role of communication strategies in UTSC (Meeks, 2023). Where vocal anti-policy voices spread negative views and misinformation on TDM policies, this can drown out majority views in favour of such policies. Participatory planning approaches that engage opposing voices into the co-design of less divisive policies may help addressing such concerns. Communication strategies may also focus on direct benefits for residents, such as more accessible, affordable, healthy, and quiet neighbourhoods, where costly automobility is an option, but not needed. Further research is needed to better understand these interrelationships, including the design of interventions and communication strategies.

5.6 Conclusions

This paper investigates discursive strategies used to oppose urban transport system change in the specific context of ULEZ, CAZ, and LTN implemented in four cities in the UK. Findings show that multiple, interlinked social media discourses drive opposition, but also represent a practice of opposition. The analysis suggests that some of these discourses are particularly important, including alternative facts, ripping off drivers, and deep values, the latter addressing fears related to family, older citizens, education, health, or access. Analysis also sees these discourses as hierarchical, with evidence that social media posts encourage violence.

To prevent conflicts related to UTSC, it is crucial to not only analyze the outcomes of TDM policies, rather than to understand the instrumental, symbolic, and affective values of cars that are at risk in the perception of vehicle owners and drivers. This allows for a deeper analytical

understanding of resistance to UTSC and the design of communication strategies and transport policies that can minimize conflict.

Findings in this paper are limited by the non-exhaustive nature of searches and identification of text from selected social media platforms and focus on a few cities in just one country. The analysis is therefore exploratory in nature but paves the way for further in-depth and expanded inquiries. It is recommended that future research include representative or exhaustive sampling, an assessment of recurrent social media actors, the legitimacy of their claims, their influence, the authenticity of social media accounts (e.g., by quantitative big data mining), and data from interventions in other countries and regions. Finally, it would be meaningful to study discourses from proponents of UTSC and identify their strategies and whether these increase or bridge the gap with opponents.

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6 P6. Dynamics in Accommodation Feature Preferences

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Abstract

Purpose: This study aims to explore the use of time series analyses to examine changes in travelers' preferences in accommodation features by disentangling seasonal, trend and the COVID-19 pandemic's once-off disruptive effects.

Design/methodology/approach: Longitudinal data are retrieved by online traveler reviews ($n = 519,200$) from the Canary Islands, Spain, over a period of seven years (2015 to 2022). A time series analysis decomposes the seasonal, trend and disruptive effects of six prominent accommodation features (view, terrace, pool, shop, location and room).

Findings: Single accommodation features reveal different seasonal patterns. Trend analyses indicate long-term trend effects and short-term disruption effects caused by Covid-19. In contrast, no long-term effect of the pandemic was found.

Practical implications: The findings stress the need to address seasonality at the single accommodation feature level. Beyond targeting specific features at different guest groups, new approaches could allow dynamic price optimization. Real-time insight can be used for the targeted marketing of platform providers and accommodation owners.

Originality/value: A novel application of a time series perspective reveals trends and seasonal changes in travelers' accommodation feature preferences. The findings help better address travelers' needs in P2P offerings.

Keywords: Time series analysis; Text Mining; Seasonality; Accommodation features; Sharing Economy

Citation:

Teichert, T., González-Martel, C., Hernández, J. M., & Schweiggart, N. (2024). Dynamics in accommodation feature preferences: exploring the use of time series analysis of online reviews for decomposing temporal effects. *International Journal of Contemporary Hospitality Management*, 36(7), 2521-2541.

6.1 Introduction

Accommodation features are known for their enduring assets but exist in a dynamic context with evolving traveler preferences. Accommodation facilities need to cater to a broad spectrum of demand patterns from travelers across different seasons and preferences (Calantone and Johar, 1984). In addition, they need to adapt to shifting traveler preferences due to long-term trends or disruptive incidents, such as the COVID-19 pandemic. Thus, a thorough understanding of the ever-evolving relevance of accommodation features is vital for hosts to effectively meet travelers' needs in the future and make well-informed long-term investments. The use of big data analyses such as machine learning and "feature mining" promises to offer valuable opportunities for personalization (Li et al., 2022) and demand forecasting, thereby increasing the hospitality industry's economic performance (Cheng et al., 2023b), which has become especially relevant in a post-pandemic world.

This is especially true for newly emerging accommodation modes, such as peer-to-peer (P2P) accommodations, where new traveler booking heuristics have been observed (Guttentag and Smith, 2022). Moreover, a more pronounced knowledge of time-specific preferences for single accommodation features may benefit price setting and revenue management, especially as scholars (Vives and Jacob, 2021) call for more individualized pricing policies.

Research has confirmed the relevance of online reviews in evaluating customer satisfaction, as review comments reflect consumers' experiences (Xiang et al., 2015). Therefore, text mining of user-generated content provides valuable insights into customers' experiences and satisfaction, for both hotel (Cheng et al., 2019; Tussyadiah and Zach, 2016) and P2P environments (Lee et al., 2023). While most of previous studies apply standard methods of static data analysis (Mody et al., 2021), such as topic modeling or sentiment analyses (Cheng and Yin, 2019; Jain et al., 2021), the underlying longitudinal data also allows for deriving insights about the dynamics of accommodation features' importance that may shift with changing seasons, long-term trends or disruption effects.

Time series data provides a valid tool for measuring cyclical and seasonal effects, as well as long-term upward or downward trends (Burger et al., 2001). Time series analyses offer insights into different components: secular trends, seasonal variations and irregular variations. This methodology is well-established (Song et al., 2019; Wu et al., 2017), especially in the field of econometrics. However, typical longitudinal studies are based on panel studies or "hard" data of revenue or other accounting data generated by companies or tourist organizations. Only recent studies have begun using search engine queries as a forecasting basis (Li et al., 2017).

Few works have used user-generated content or customer reviews in forecasting methods, and those have been limited to price predictions (Kalehbasti et al., 2021). Thus, we aim to further explore the potential of these methods for analyzing travelers' unstructured online reviews.

This study presents a novel methodological approach: It applies time series analysis in the context of online traveler reviews to investigate the dynamics of single accommodations' feature importance. In a case-study setting (P2P accommodation in the Canary Islands), we use Airbnb reviews between January 2015 and April 2022 to disentangle seasonal, trend and once-off effects impacting accommodation features' importance by using time series analysis. Grounded in big data research, text mining is used for the analysis (Li et al., 2018). Robust analyses are applied as text data is inherently limited in scaling (nominal scales of verbal data). By applying such a novel method to the P2P field, we aim to bridge the sphere of econometricians with those of statistically less sophisticated users of trend analyses.

In our case-study setting, we find that single accommodation features are subject to pronounced seasonal variations and recurring demand patterns. Furthermore, we identify long-term trend effects in single accommodation features' relevance that began well before the pandemic. In contrast, the one-time disruptions caused by the COVID-19 pandemics seem to be limited to temporary effects only.

6.2 Literature Review

6.2.1 Applications of time series analyses: A brief overview

Forecasting tourism demand has been a key research endeavor for the past decades. It is primarily applied to predict tourist flows, pricing issues and visitor frequency (Song et al., 2019). Several forecasting methods exist (econometric, AI-based, judgmental models) (Hu and Song, 2020). Time series models are often applied due to their ease of implementation and their ability to capture historic patterns (Song et al., 2019). Time-series models decompose the timely variations of a focal variable by analyzing its own past patterns to explore long-term trends, as well as short-term patterns like seasonality. Recently, forecasting has gained even more relevance as scholars have attempted to predict the recovery of tourism from the pandemic (Zhang et al., 2021), supported by the wide-spread availability of internet data (such as search engine data, see e.g. Hu and Song, 2020).

Song et al. (2019) report on several new techniques and applications. Time series, among other indicators such as Gini indicator, or Theil index, has also been used to measure seasonality (Yabanci, 2023). More specifically, Ye et al. (2018) use temporal data of online travel reviews

and time series to unveil seasonal traveler preferences and Kaya et al. (2022) use hotel features to enhance the time series models of forecasting. However, the combination of forecasting methods based on text mining in the P2P market, as applied in this study, seems to be a relatively unexplored approach. Therefore, our study offers a complementary perspective on demand modeling by using text mining to identify the dynamics of single accommodation features.

Previous studies used time series analyses to forecast demand in P2P setting as well. For instance, Curto et al. (2022) investigated the growth rate of Airbnb to predict the market forecast for P2P. Similarly, Ghosh et al. (2023) and Peng et al. (2020) developed a price prediction model for P2P rentals. Peng et al. (2020) also include customer reviews, accommodation features and geographical data as price predictive factors while other authors predicted Airbnb listing prices using amenities-driven features only (Islam et al., 2022; Kalehbasti et al., 2021). Islam et al. (2022) report that the number of bedrooms, accommodations, property types and the total number of reviews positively influence the listing price.

However, to the best of our knowledge, very little is known about forecasting the demand for specific tourism accommodation features. Insights about the dynamics of single accommodation features could be beneficial for professionals in forecasting and decision-making, thereby improving the performance of their rentals. To gain easy access to the required data, we rely on online reviews as the basis. Hence, this study is the first to apply the time series methodology to forecast single tourism accommodation features. The underlying research question is how time series analysis of online reviews can be used to identify and decompose temporal effects for different accommodation features.

6.2.2 Seasonal effects: Recurring importance patterns

Seasonality describes the concentration of tourism flows in relatively short periods of the year due to temporal variation. This issue and its implications are of key concern for the tourism industry (Butler, 1998; Cannas, 2012). Most tourist destinations exhibit systematic and recurring patterns of fluctuation in tourism activities throughout the year (Higham and Hinch, 2002), caused e.g. by weather changes, calendar effects or (school) holidays (Parrilla et al., 2007; Vergori, 2017). Furthermore, seasonality is influenced by both demand and supply factors. Hereby, scholars typically differentiate between three seasons, with either one (e.g. summer), two (e.g. summer and winter) or no peak season per year (Vergori, 2017). Analyses typically focus on the influence of seasonality on pricing (Espinet et al., 2012).

Studies indicate that Airbnb alters the way seasonal demand is accommodated: While hotels' seasonal pricing dampens the underlying demand, Airbnb's seasonal supply (i.e. more listings during high-demand seasons) helps resolve the conflict between cyclical demand and fixed hotel capacity to better meet seasonal demand (Li and Srinivasan, 2019). Furthermore, demand in the P2P market is less subject to seasonality than the hotel market (Benítez-Aurioles, 2022) and prices display a smoother seasonal pattern than hotels (Saló et al., 2012).

Across seasons, guests have diverse motives for traveling (Calantone and Johar, 1984). Scholars thus suggest customizing tourism products in different seasons to tourists with different motives to attract visitors outside of peak months (Šegota and Mihalic, 2018). In line hereto, we hypothesize that different accommodation features are subject to varying seasonality. We investigate distinct seasonal effects for travelers' preferences of single accommodation features through a time series analysis of online reviews. Linking the influence of seasonality or other timing effects at this fine-grained level has previously not been investigated. While research analyzed overall demand for accommodation features, its seasonality issues are one of the least concerned aspects (Wang et al., 2019). Therefore, a clear need arises for differentiating the impact of seasonality across accommodation features.

6.2.3 Trend effects: emerging feature importance

Beyond seasonal effects, accommodation features may also be influenced by trend effects, i.e. patterns of gradual changes over time. This study investigates whether trend effects can be observed in travelers' perceptions of the importance of accommodation features. P2P accommodation offerings have transformed the hospitality industry, and their popularity has grown considerably (Anwar, 2018). While cost benefits initially were a primary motivation to choose P2P settings (Hamari et al., 2016), they have become less influential in travelers' decision-making process (Wang and Jeong, 2018) as P2P accommodations became more extravagant and cater to consumers' individualization aspirations (Hardy and Dolnicar, 2018). The desire to immerse oneself in a foreign environment has been identified as a key motivation to use P2P accommodations, which are typically located in more residential, less touristy areas than hotels (Hamari et al., 2016). In addition, the availability of more space and home benefits are driving factors for choosing P2P accommodation (Guttentag et al., 2018). Thus, the importance of various accommodation features may have evolved. This study investigates whether systematic changes can be identified for single accommodation features. By conducting a time series analysis of online reviews, we aim to differentiate the patterns of underlying long-term trends of the importance of single accommodation features.

6.2.4 Disruption effects: The Covid-19 pandemic as disruptive event

The relevance of accommodation features can also be influenced by one-time disruptive events. The COVID-19 pandemic had unprecedented effects on the size and structure of travel demand, impacting both the hotel industry and P2P market (Cheng et al., 2023a). Therefore, the COVID-19 pandemic is chosen as an application case for disruption effects. In the specific case of the Canary Islands, the Spanish Government was forced to take decisive action (Han et al., 2020): On 14 March 2020, the Spanish Government declared a nationwide state of alarm, which imposed stringent lockdown measures. This initial lockdown was gradually eased in stages starting in May 2020. Subsequently, the Spanish Government adopted a more region-specific approach to manage localized outbreaks, reopening the borders in July 2020. These measures included regional restrictions, curfews, capacity limits in public places, social distancing guidelines and mask mandates (Frontur, 2019).

The COVID-19 pandemic, therefore, aligns with Kilkki et al.'s (2018) definition of disruption. Owing to lockdowns, travel fear and uncertain quarantine measures, consumers were significantly restricted in their vacationing choices, leading to an adapted decision set for tourism accommodation choices. For instance, travelers were reluctant to book shared flats in late 2020 (Bresciani et al., 2021) and the importance of hotel attributes shifted during different phases of the pandemic (Hu et al., 2021). Enhanced preventive measures provided by hosts positively influenced consumers' attitudes (Qi and Chen, 2022). Ye et al. (2022) confirm preference shifts between conventional hotels and P2P accommodation for key accommodation value attributes, such as location.

As the importance of single accommodation features was clearly influenced by disruption effects, this study examines the effects of the COVID-19 pandemic on the importance of single accommodation features. We aim to distinguish short-term from lasting trend effects that arise from this one-time incident.

6.3 Methodology

6.3.1 Case description: Canary Islands

A data set of 519,200 traveler reviews from Airbnb accommodations in the Canary Islands was collected through Web scraping. The Spanish archipelago located in the Atlantic Ocean offers a highly diverse range of tourism experiences, including sun-and-beach vacations, nature-based holidays and city trips (Eugenio-Martin et al., 2019). With more than 15 million tourist arrivals in 2018 (Frontur, 2019), it is one of the most popular tourist destinations in Europe. As it offers

mild to high temperatures all year round, it is a non-peak season destination, showing atypical seasonal patterns influenced more by timing and calendar effects in the source market than by climate variations.

For this reason, the Canary Islands were chosen as an “extreme” case in terms of traditional seasonal pattern models to demonstrate the effects of seasonality in atypical, non-peak beach destinations. Due to stable climatic conditions, fluctuations in demand patterns are most likely to be influenced mainly by travelers’ preferences, which change throughout the year. Official tourism statistics (ISTAC, 2018) indicate that more mature travelers visit the Canary Islands in winter, while younger families are expected to visit during the summer school holidays. In the winter, tourists often prefer nature-oriented activities (e.g. hiking), while in the summer, the beaches and pools are the most popular attractions.

6.3.2 Data collection and processing

The raw data was obtained from AirDNA, an Airbnb data provider, and included publicly accessible review comments between November 2014 and April 2022. This data set contained a total of 1,043,112 review comments. The Cdl2 R package (Ooms, 2022) was used to identify and select English language reviews only, as language processing tools for English are more robust. For estimation stability, the sample was limited to reviews published after January 2015, as very few reviews were available before this date. Finally, 519,200 comments were selected. As shown by Smironva et al. (2020), online accommodation reviews do not suffer from more pronounced non-response bias in comparison to offline reviews.

Using the text mining software R, time series analyses were performed to investigate changes over time (seasons, trends, and the disruptive event that was COVID-19) on the occurrence (i.e. mentioning) of different accommodation features as we assumed that the frequency of mentions of single accommodation features indicates the importance travelers give to these attributes, as it is common practice in examining customer opinions in mined text (Hu et al., 2021; Liu et al., 2017). Similarly to other studies, this study used the mentioning frequency within a specified period to identify an attribute’s importance within that period. We manually checked reviews to ensure the mentioning of single accommodation features was indeed related to aspects of relevance and not occurring randomly. Table 26 presents the distribution of reviews over the specified time period and reveals that review comments are more frequent in winter than in summer. Notably, a disruptive effect of COVID-19 is evident.

6.3.3 Variable selection

To identify suitable features for the analysis, the authors performed a literature review on accommodation attributes, which covered both traditional and P2P perspectives, as previous studies (Cheng and Yin, 2019) found that travelers consider both traditional hotel and specific P2P attributes when choosing P2P accommodations. Mody et al. (2022) find evidence supporting the convergence of attributes considered important to consumers across accommodation segments (hotels and P2P). The most crucial attributes are quality and service factors, followed by amenities (i.e. kitchen, pool) and accessibility and safety. However, for P2P accommodations, the concept of accommodation experiences expands beyond the room's interior. It also includes aspects such as the overall facilities of the whole apartment or the local neighborhood (Guttentag et al., 2018). Furthermore, P2P guests perceive their stay as providing a more authentic local experience than staying in a hotel (Birinci et al., 2018). For our analysis, we adopt a framework comprising four dimensions:

- (1) interior (room, cleanliness, household furnishings and equipment, etc.);
- (2) exterior dimension of the room(s) (e.g. facilities such as a terrace and view);
- (3) the overall complex of the accommodation (e.g. pool); and
- (4) the surroundings (relating to the location and accessibility of tourist attractions).

To select appropriate feature examples for each dimension, the authors conduct a frequency analysis to identify key attributes.

Table 26. Frequency occurrence of English reviews of Canarian Airbnb accommodations from April 2015 to April 2022.

| Month | Year | | | | | | | |
|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
| Jan | 1,489 | 4,031 | 9,737 | 12,165 | 13,214 | 11,865 | 5,270 | 14,238 |
| Feb | 1,301 | 3,878 | 8,842 | 9,971 | 11,887 | 11,616 | 3,876 | 13,596 |
| Mar | 1,480 | 4,314 | 10,133 | 11,624 | 13,216 | 7,357 | 5,151 | 15,030 |
| Apr | 1,083 | 2,889 | 6,934 | 6,877 | 7,982 | 136 | 5,524 | 6,251 |
| May | 771 | 2,133 | 4,741 | 4,869 | 5,375 | 102 | 5,633 | |
| Jun | 664 | 1,614 | 3,610 | 4,246 | 4,368 | 258 | 3,721 | |
| Jul | 711 | 2,129 | 4,089 | 4,410 | 4,442 | 2,152 | 4,572 | |
| Aug | 941 | 2,806 | 4,518 | 5,002 | 4,733 | 3,303 | 5,653 | |
| Sep | 1,109 | 3,343 | 5,468 | 5,862 | 5,457 | 1,999 | 6,041 | |
| Oct | 1,513 | 4,341 | 6,440 | 7,203 | 6,633 | 2,158 | 8,594 | |
| Nov | 2,542 | 7,281 | 9,878 | 10,811 | 10,054 | 5,012 | 13,562 | |
| Dec | 2,947 | 7,416 | 9,949 | 10,995 | 10,082 | 5,669 | 12,318 | |

6.3.4 Frequency analysis of key attributes

Text mining was used to identify the key attributes of P2P accommodation feature relevance in the sample. Previous works have shown the effectiveness of text mining in analyzing review data to determine feature relevance in the hospitality industry (Cavique et al., 2022). For instance, Liu et al. (2017) used user-generated reviews on TripAdvisor to evaluate hotel attributes, Hu et al. (2021) used hotel reviews to assess attribute importance during the COVID-19 pandemic and Hu et al. (2019) scrutinized accommodation reviews to investigate repeat patronage.

Before conducting the time series analysis, we carried out a pre-test and a data check. As shown by scholars (Liu et al., 2017; Vu et al., 2019), the frequency of mentions of single accommodation features indicates the importance travelers give to these attributes. Thus, we regarded the mentioning of specific features in reviews as an indicator of their importance. Consequently, we performed a keyword analysis of absolute incidences of features, screening for proxies with particular prominence in the analysis context. The screening revealed six key features with specific relevance in the dataset: room, terrace, view, pool, location and shop.

The authors then examined the mean occurrence of each feature in all reviews, indicating how often each feature was mentioned in the sample. As shown in Table 27, “location” was mentioned most often (approximately 25% of reviews), while “terrace” and “shop” were mentioned in about 10% of the reviews in the sample. In the context of COVID-19, it is worth acknowledging that two exterior (terrace, view) and two surrounding dimension features (location, shops) demonstrated relatively high relevance of features outside the interior dimension.

Regarding monthly variations, “view” exhibits the highest fluctuation (delta $\sqrt{4}$ 0.186) over the analyzed period, while “shop” shows the lowest fluctuation (delta $\sqrt{4}$ 0.0866). These meaningful variances in the mentioning frequency of each specific feature allowed for a longitudinal data analysis of relative changes in reviews over time. This analysis focuses on relative rather than absolute numbers, thereby overcoming possible limitations of text mining, such as sample selection or omission biases (Humphreys and Wang, 2018).

6.3.5 Data decomposition

A decomposition analysis of the time series is conducted for each of the variables. This statistical technique is used to disentangle a time series into its underlying components, including trend, seasonal, and irregular or random variations. The decomposition of a time

series provides valuable insights into the data's patterns and behavior, which can be useful in forecasting, anomaly detection, and decision-making (Hyndman and Athanasopoulos, 2018).

Table 27. Feature occurrence per time period
(percentage of monthly reviews mentioning the specific feature)

| Feature | Mean | Max | Min |
|----------|--------|--------|--------|
| View | 21.49% | 33.33% | 14.73% |
| Terrace | 08.68% | 12.38% | 4.65% |
| Pool | 14.02% | 22.54% | 6.59% |
| Shop | 08.31% | 11.37% | 2.71% |
| location | 25.89% | 32.92% | 19.38% |
| Room | 13.14% | 21.14% | 6.20% |

Multiscaling (Zhang et al., 2022) is commonly used in tourism demand forecasting due to its ability to capture the nonlinear and non-stationarity characteristics of time series through several steps, combining decomposition and prediction. Examples of such methods include empirical mode decomposition (EMD) and seasonal trend decomposition (STL). Multiscaling methods have been found suitable for demand forecasting as well (Li and Law, 2020; Xie et al., 2020), although filtering methods have also shown their suitability for forecasting tourism demand in the world's top 20 destinations (Liu et al., 2023). Given its extensive use (Cleveland et al., 1990), we choose STL as the decomposition method for the time series of the review comments.

First, the researcher has to choose between an additive or multiplicative model. The choice between these models depends on the nature of the underlying time series components. Typically, an additive model is appropriate when the seasonal fluctuations or the random variation around the trend remain constant over time, regardless of the level of the time series. To test this point, we regressed the standard deviation as a function of the mean for the six accommodation features. The results show that the relationship between standard deviation and mean is null at the 99% level of significance for all features, justifying the use of the additive model. It can be written as follows:

$$y(t) = \text{Trend}(t) + \text{Seasonal}(t) + \text{Residual}(t)$$

where $y(t)$ is the value of the time series at time t , $\text{Trend}(t)$ is the trend component at time t $\text{Seasonal}(t)$ is the seasonal component at time t and $\text{Residual}(t)$ is the residual or random component at time t , calculated by subtracting the estimated seasonal and trend components.

In the STL method, the trend and seasonal fluctuations are calculated by using local weighted regression. Results are visualized by locally estimated scatterplot smoothing (LOESS). The decomposition analysis was conducted by using the R package “stats,” which allowed the authors to separate the temporal development of accommodation features into trend and seasonal development. In addition, we inspected the remaining data (i.e. the fluctuations that cannot be explained by seasonal or trend aspects). Figure 22 presents the results of this variance decomposition.

Subsequently, we analyze the occurrence of features based on seasonal and trend decomposition. Figure 23 illustrates the seasonal occurrence for each feature. The results show that specific recurring patterns can be identified for each feature. Some features (i.e. shop, location) exhibit high fluctuations throughout the year, while others (i.e. room, pool) show only moderate changes in occurrence. Therefore, we proceeded to further analyze seasonal effects at the level of single features.

6.4 Findings and Discussion

6.4.1 Seasonal effects

Seasonal patterns across each 12-month period for different accommodation features are summarized in Figure 24. The analysis reveals that the seasonality patterns for each feature differ significantly. The importance of “pool” reaches its peak during the summer, while other features such as “view” and “terrace” peak in spring and autumn, and “room” peaks in the winter period. This indicates that an aggregated (shared) view of seasons is not applicable. Instead, it emphasizes the need to separately assess and evaluate the seasonal effects for each of the six accommodation features.

For the features “view” and “terrace,” we observe recurring peaks in spring (March, April, and May) and autumn every year, with a low point in June. One interpretation thereof may be that, in spring and autumn, active, nature-seeking travelers value the view from their accommodation relatively more than beach seeking families on their summer holidays. The “pool” category shows the highest peak during the summer months of July and August, with above-mean occurrence in the shoulder seasons on either side of the summer season (April to June and September to October). The relevance of a pool seems to be highest for summer vacationers (as well as travelers) to the Canary Islands during Easter and fall holidays (e.g. families with school children). These findings are in line with previous research that reports a high preference for

swimming pools among children on holiday and highlights that their preference is taken into account by their parents (Curtale, 2018).

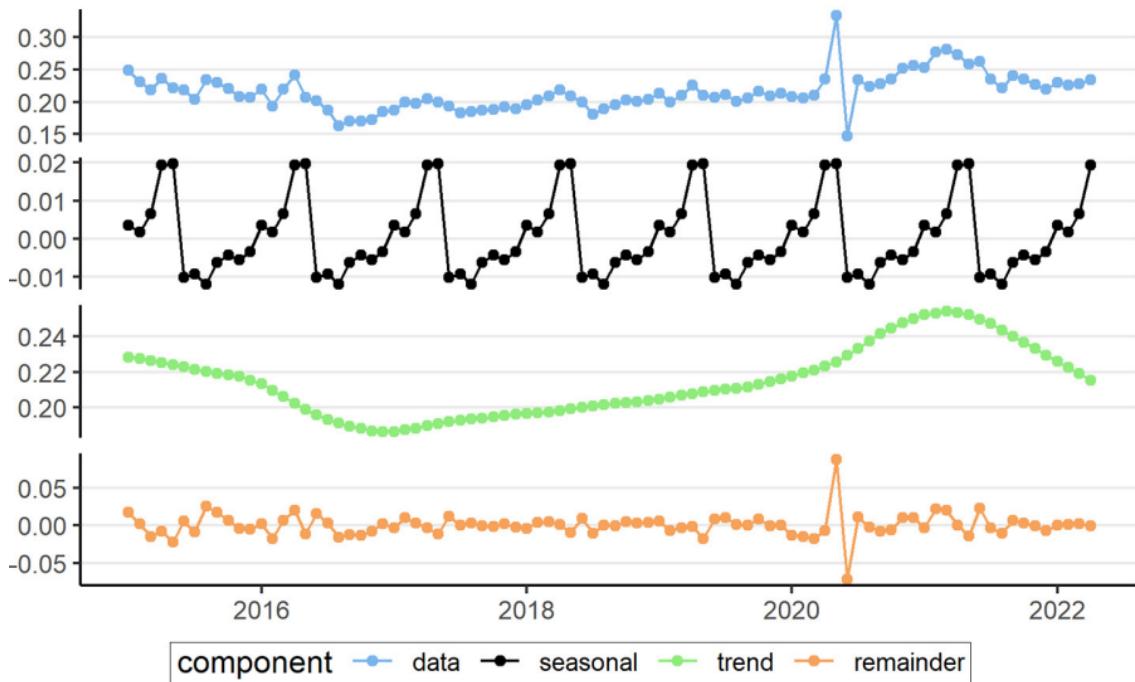


Figure 22. Occurrence of “view” in Airbnb reviews from an overall, seasonal, trend and disruption perspective. Own creation.

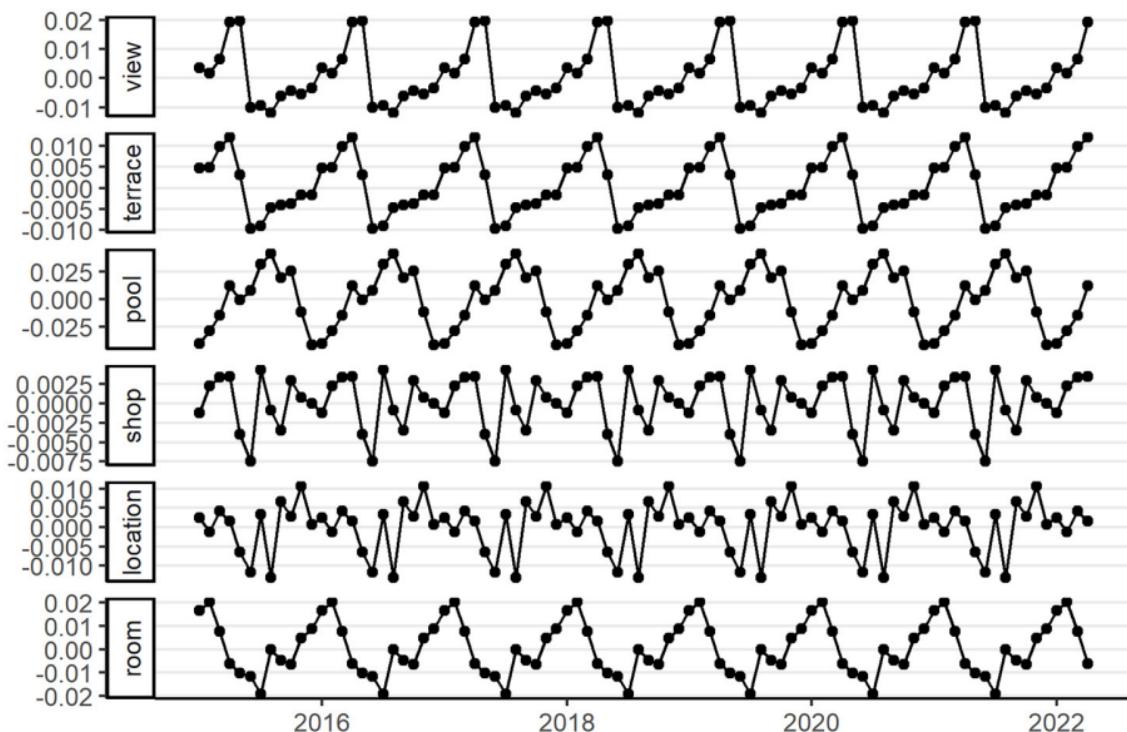


Figure 23. Seasonal decomposition of accommodation features. Own creation.

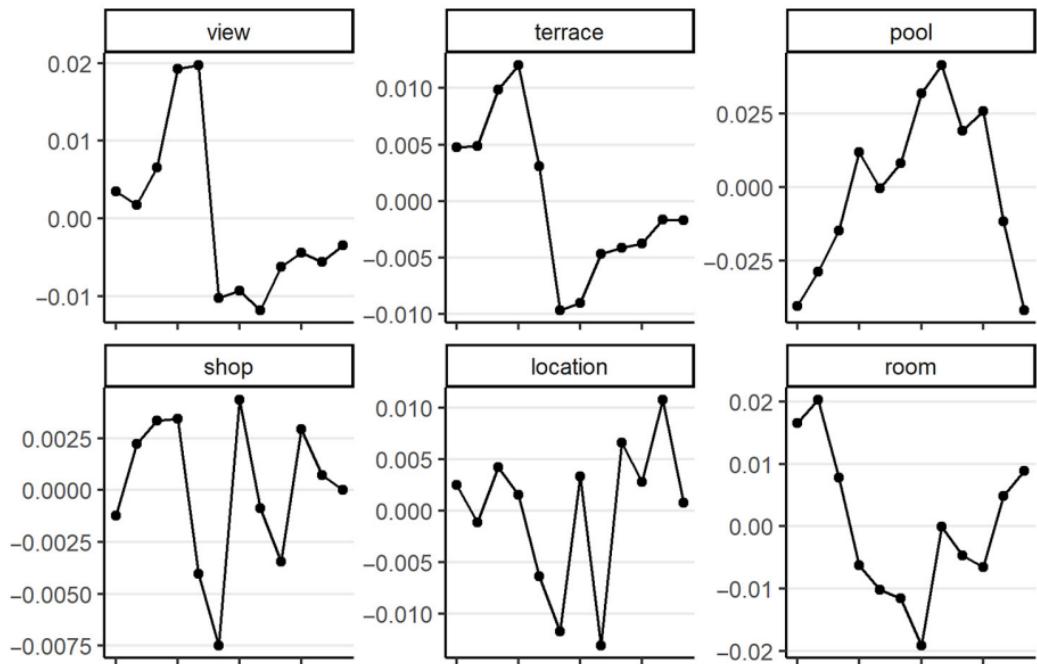


Figure 24. Seasonal patterns for accommodation features (January to December). Own creation.

Regarding the “room” variable, we observe a peak in the winter months. During this colder period of the year, travelers spend more time indoors and, consequently, place a higher value on the importance of the interior and amenities. In addition, winter tourists are often pensioners with higher expectations for the quality of the room and its amenities. These interpretations align with research by Ananth et al. (1992) and Caber and Albayrak (2014), who find that mature travelers value different accommodation attributes compared with younger travelers. Indeed, these findings confirm the importance of segmentation for hotel attributes (Wong and Chi-Yung, 2002).

As hypothesized, we were able to identify distinct seasonal effects on travelers’ assessment of single accommodation features, in terms of both magnitude and timing, through a time series analysis of online reviews. The only fluctuation that cannot be explained by face validity is the “shop” category with peaks in March, April, July and October.

6.4.2 Trend effects

Next, we analyzed the sample based on a trend perspective. Figure 25 depicts the trend development for each feature between the years 2015 and 2022. We observe both features with enduring downward (shop, room) and upward trends (location), as well as features exhibiting changing trend patterns over the years (pool, terrace, view). Regarding the latter, both the “view” and the “terrace” categories show an initial decline starting in 2016 and a period of

stagnation before increasing in 2021, specifically from May 2020 to mid-2021. The initial drop in 2016 can be associated with the establishment of Airbnb in the European market. The increase in the occurrence of “view” and “terrace” in 2021 coincides with the climax of the COVID-19 pandemic and its measures of social distancing.

The “room” and “shop” categories exhibit a persistent downward trend from 2017 onward. Particularly, the “room” feature (e.g. equipment, furnishings, design, size, atmosphere) seems to have lost relevance. Interpreting the data in light of trend effects, one could argue that, during Airbnb’s early years, the rooms were perceived as novelty benefit. Travelers were possibly intrigued by the novelty of the business model and by extravagant or unique accommodations (Guttentag et al., 2018). For instance, Guttentag and Smith (2022) found that early Airbnb adopters were less interested in hotel-like features and more inclined to use alternative, nonhotel lodging options. By contrast, late adopters were seeking less novelty and innovation, suggesting a saturation of Airbnb’s novelty benefits. More professional accommodation offerings as well as travelers’ familiarity with platforms like Airbnb may have led to a decrease in feature relevance.

Moreover, we observe an ongoing upward trend for the “location” feature, which typically refers to the accommodation being conveniently close to tourist attractions, transportation, and points of interest (Shoval et al., 2011). We find a considerable increase of location’s relevance between 2015 and 2019, presumably as travelers seek more individuality and uniqueness (Berrada, 2017). This may be also be explained by an increased spatial distribution of Airbnb rentals over time, transitioning from a concentration in tourist centers to a center–periphery structure (Zhang and Fu, 2022) and, thus, offering travelers more options in terms of locations. In sum, the data shows that the relevance of different accommodation features is indeed influenced by long-term trend effects, as exemplified by Airbnb’s market penetration.

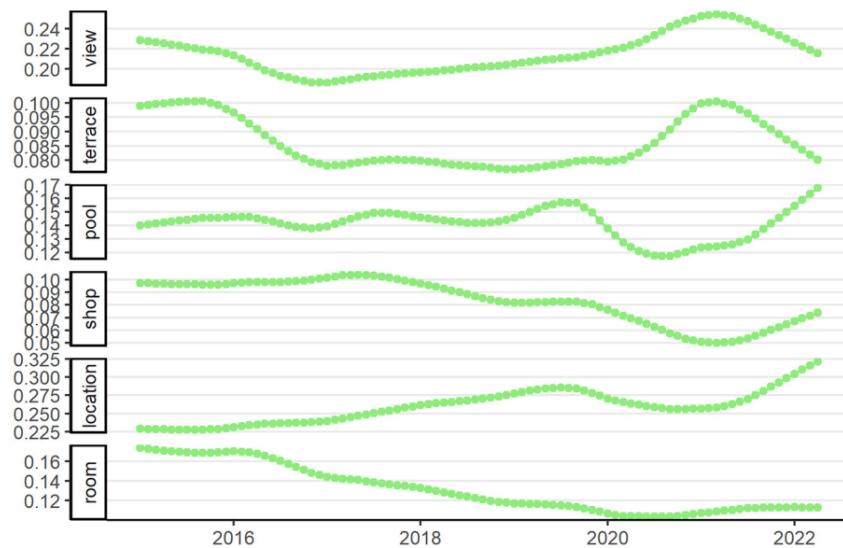


Figure 25. Seasonal patterns for accommodation features (January to December). Own creation.

As hypothesized, we could differentiate the patterns of underlying long-term trends of single accommodation features' importance through a time series analysis of online reviews. Looking at the first year of COVID-19 (the pandemic's impact on European tourism became palpable in March 2020), we find a steep decline in the occurrence of the "pool" and "location" categories. For "location," the generally consistent increase was interrupted by a brief decline in 2020, but it increased again in 2021 and 2022. The occurrence of "pool" returned already in late 2020. There was also a higher occurrence of "view" and "terrace" in 2020, followed by a decline after 2021. This already hints towards diminishing long-term effects of the COVID-19 pandemics, as will be discussed in Section 6.4.4.

6.4.3 Single-time disruption effects caused by Covid-19

An analysis of the remainder is used to identify one-time disruptions in the time series (Figure 26). The residual variance is especially high in the period from April to June 2020, i.e. the first lockdown phase in Europe, when traveling was virtually impossible, and subsequently decreased in the following months of COVID-19 restrictions. Zheng et al. (2021) provide a possible explanation, showing that COVID-19 generated an unprecedented level of fear caused by the severity of and susceptibility to the threat. This led to new (protective) travel behaviors immediately after the outbreak of the pandemic.

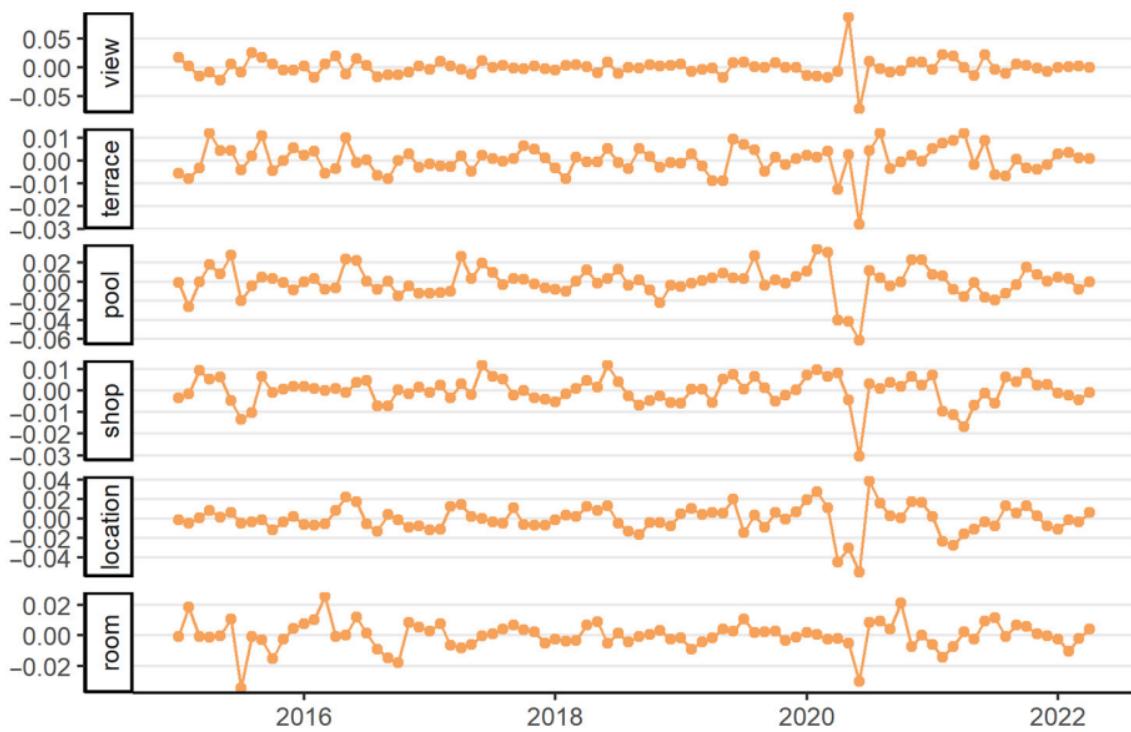


Figure 26. Remainder of decomposition. Own creation.

Both the “view” and “terrace” categories exhibit notably large unexplained deviations in May 2020 and June 2020. These values indicate that neither seasonality nor trend effects were responsible for the change in keyword occurrence in the reviews. Simultaneously, a shift in the long-term trend can also be observed with steep increases as of May 2020 (Figure 26). This hints at the influence of external factors in the early stages of the COVID-19 pandemic on European tourism in the spring of 2020. These findings enrich findings of enhanced seasonal fluctuations in tourism demand due to COVID-19 (Yabanci, 2023). They align with previous studies that claim customers’ preferences for specific hotel attributes changed, such as increased demand for hotels and rooms with access to or views of blue spaces due to COVID-19, while the importance of location decreased (Srivastava and Kumar, 2021). However, they contradict more recent findings by Ye et al. (2022).

The remaining data of the “pool” category suggests a nonexplainable development in April, May and June 2020, indicating a significant impact of COVID-19. Similar effects are observed in the trend development for the relevance of shops close to accommodation facilities, with the lowest point in the spring of 2020 and an increase in 2021. Consequently, we can conclude that COVID-19 caused one-time disruption effects on the relative importance of accommodation features, with the effects varying in terms of magnitude and duration.

6.4.4 Long-term effects caused by the pandemic

Trend shifts before and after the spreading of COVID-19 indicate possible long-term effects caused by the pandemic. However, no definitive effect could be observed. By contrast, several non-lasting effects are revealed as almost all trend patterns reverse after the immediate COVID-19 situation, and the old trends are re-established. For instance, the occurrence of the “view” category decreased before COVID-19, then increased again to peak in May 2021 before becoming less relevant. This suggests a non-persistence in the disruption effect. With the onset of the COVID-19 pandemic, tourists who traveled again after experiencing containment and various regional lockdowns may have felt a stronger desire for nature and a sense of freedom of movement, as reported e.g. by Jarratt (2021). The decline in popularity of the “view” category after 2021 might indicate a changed interest among people after most restrictions were removed. Comments then focused on reinstated social activities, such as enjoying the pool, shopping and seeking a good location.

The same could be assumed for the “terrace” category, which shows a slow decline after a potential novelty effect in 2016, followed by a steep increase from May 2020 to mid-2021 during the pandemic. During the time, guests possibly placed a higher value on outdoor space, perhaps half-expecting quarantine measures due to changing travel restrictions. However, data suggests that access to a terrace became less relevant after 2021, when most restrictions and quarantine measures were lifted.

The “pool” feature (e.g. private or shared pool) experienced its lowest occurrence in the spring of 2020, coinciding with the advent of the pandemic in Europe. We assume that preventative and protective measures, such as physical distancing and mask-wearing, along with pool closures, led to the diminished relevance of pools. According to the data, travelers seemed to be more comfortable using pools in 2021, which may be attributed due to the general availability of COVID-19 vaccines in Europe (Gössling and Schweiggart, 2022).

The relevance of “location” declined at the beginning of the pandemic, which can be interpreted as an indication that the location’s proximity to sightseeing spots or city centers became less relevant to travelers. During that time, travelers preferred more secluded areas where it was easier to maintain physical distance and manage their fear of contamination. With fewer restrictions in 2021, “location” became more relevant again since attractions in the surroundings were once again accessible. These findings align with the research of Park et al. (2021), who show that travelers had a diminished preference for crowded places during the pandemic.

6.5 Conclusions

6.5.1 Summary and conclusion

In this case study application, we demonstrate how time series can disentangle different temporal effects by decomposing seasonal, trend and disruption effects. A new perspective on seasonality is provided by showing that accommodation features possess different seasonality patterns. Findings also identify several trend effects which can be linked to the diffusion of P2P accommodation offers. Finally, in the context of the COVID-19 pandemic in the Canary Islands, our case study reveals notable short-term disruption effects, however no lasting long-term effects. Method-wise, we present a novel application of the time series analysis method. While established decomposition/forecasting analyses rely on “hard data” such as revenue or sales data (see e.g. Song et al., 2019), our study applies robust analyses to investigate “soft data” of written reviews. In so doing, we explore the method’s potential for unstructured content, specifically user-generated online reviews by travelers.

6.5.2 Theoretical implications

The findings demonstrate the need to look beyond the traditional two-peak seasonality and show that different seasonal effects influence individual preferences for accommodation features. This highlights the need for a more nuanced approach to seasons, based on different guest groups and their motives for traveling. Scholars like Ananth et al. (1992) have already shown that accommodation features’ relevance differs between age groups. Researchers could further assess single accommodation features’ temporal relevance for different guest groups (segments) throughout the year.

By examining accommodation features’ relevance over multiple years and differentiating between temporary and permanent importance shifts, we identify long-term trend effects and one-time disruption effects due to COVID-19. Trend analyses indicate important shifts in accommodation features’ relevance well before the COVID-19 pandemic’s disruption effects. In contrast, the pandemic’s effects seem to be limited to short-term temporal changes in accommodation features’ relevance, since no long-lasting effects were verified.

Our study demonstrates the potential of time series analysis for analyzing unstructured content from user-generated content. The data and the methodology indicate fluctuations in and trend effects of accommodation features’ importance. As such, the latter is applicable to a larger data sample, which allows more long-term changes to be interpreted.

Since accommodation managers specifically aim to promote “green” practices (Yang et al., 2023) to address and monetarize current consumer preferences (Gupta et al., 2023), our time series approach could be extended to also investigate sustainability features. Forecasting travelers’ needs in a temporal dimension could include pro-environmental attitudes, thereby differentiating specific target groups. However, caution should be maintained regarding not engaging in greenwashing practices (Majeed and Kim, 2023).

6.5.3 Practical implications

This study has valuable insights for both practitioners and students. They can use our method to identify accommodation features’ seasonal dependencies by examining the guest reviews of these features closely to infer specific seasonal patterns. While many accommodation providers might have intuitively applied this practice, a more structured approach could potentially increase profits. Improving time-specific advertising campaigns for accommodation and highlighting distinct features across different communication channels could help differentiate between target groups.

On a more conceptual level, the results address an important, but underexplored, issue in pricing research by indicating seasonal demand issues (Vives et al., 2018). The evidence of seasonal variations at the attribute level might offer new approaches to price optimization: Future models might include seasonal discrepancies between static supply and seasonally varying demand for different accommodation features. Price differentials between two market offerings, for example, a room with a view and one without, should not be fixed the entire year, but depend on the feature’s seasonal relevance for travelers. That is, a higher price should be charged for a room with a view in spring and fall (important months for “views”), while asking a (relatively) smaller surcharge in the summer months (less important for “views”). Hence, future price optimization techniques could include an attribute-based seasonal price discrimination.

P2P platforms could leverage this knowledge further and develop a tool for accommodation providers that monitors trends based on guest reviews or searches continuously (Haldar et al., 2020 for initial ideas). This allows real-time recommendations derived from trend and seasonal analyses to be used for demand optimization, price and product management in P2P networks (Benítez-Aurioles, 2022). In turn, accommodation providers can better address customers’ seasonal wants and needs, as well as market and highlight specific seasons’ accommodation features. Daily marketing can even be used to target insights (e.g. “Demand for pools is currently rising. You should now highlight this feature in your house description”).

Consequently, we consider our work an initial step toward the implementation of a real-time forecasting model for tourist accommodation features.

6.5.4 Limitations and future research

Despite its novel contributions, our study also has limitations. While the authors selected relevant accommodation features based on a literature review, they only examined six features due to their respective prominence in the sample data. Future research could build composite models across different accommodation features (Pan and Yang, 2017) and add other data sources, as e.g. website traffic, weather (Li et al., 2017), to create a joint model for assessing temporal variations of accommodation feature preferences.

While there are multiple variants of time series analysis (Song et al., 2019), the contingency principle implies that used methods need to fit to study objectives. Our decomposition of traveler reviews sought to identify temporal variations of accommodation features' relevance. Future studies can further insight by addressing forecasting issues with more sophisticated methods.

This study examined seasonality for a limited geographic area and specific climate conditions, being P2P accommodations in the Canary Islands. Future studies could expand the trend and seasonality analyses of accommodation features to hotel settings and other destinations with different seasonal characteristics (one-peak, two-peak or multiple-peak), climate conditions, or target groups. Finally, keyword occurrence is neutral and does not provide a positive or negative assessment of the specific feature. To link this research to satisfaction studies, consumer sentiment needs to be integrated (Wang et al., 2018), while potential non-response biases have to be addressed. Such future analyses might provide insights into the dynamics of consumer satisfaction.

Despite these limitations, this study lays the groundwork for scholars and practitioners aiming to better anticipate tourist accommodations according to the preferences of different guest structures and target groups. Time series analysis can be a valuable tool for tourism forecasters, allowing them to observe both long-term and cyclical trends in visitor behavior. Future research could use this first application case to build more elaborate models for analyzing and even forecasting demand for specific accommodation features. Continuous implementation of more elaborate forecasting through text mining of time-series data could significantly enhance real-time monitoring and management of tourist accommodation.

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7 P7. Two Years of COVID-19 and Tourism: What We Learned, and What We Should Have Learned

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Abstract

In January 2020, infections with a novel coronavirus were confirmed in China. Two years into the pandemic, countries continue to struggle with fifth and sixth waves, new virus variants, and varying degrees of success in vaccinating national populations. Travel restrictions continue to persist, and the global tourism industry looks into a third year of uncertainty. There is a consensus that the COVID crisis should be a turning point, to “build back better”, and that a return to pre-pandemic overtourism phenomena is undesirable. Yet, there is very limited evidence that the crisis has changed or will change tourism beyond the micro-scale. In regard to many issues, such as new debt, global tourism has become more vulnerable. Against the background of the climate crisis, the purpose of this paper is to take stock: Which lessons can be learned from the pandemic for global warming? To achieve this, relevant papers are discussed, along with a dissection of the development of the crisis in Germany, as an example of ad hoc crisis management. Findings are interpreted as an analogue to climate change, suggesting that our common interest should be to put every possible effort into mitigation and the avoidance of a $> 1.5^{\circ}\text{C}$ future.

Citation:

Gössling, S., & Schweiggart, N. (2022). Two years of COVID-19 and tourism: What we learned, and what we should have learned. *Journal of Sustainable Tourism*, 30(4), 915-931.

7.1 Introduction: Two years of COVID-19

Almost two years after the outbreak of the COVID-19 coronavirus in Wuhan, China, and about 20 months after the spread of the virus to most countries in the world, the availability of vaccines has made the global pandemic more manageable in some countries, but the crisis is far from over (WHO, 2021). Struggling with fifth, and sixth waves, new highly infectious virus variants such as Omicron, the unavailability of vaccines in poor economies, and the protests of the “antivaxxers” in significant parts of the population in industrialized countries, COVID-19 continues to affect national economies, businesses, health services and social life. While tourism advocacy organizations (WTTC, 2021a) and academics (Deb & Nafi, 2020; Dias et al., 2021; Dube et al., 2021; Gu et al., 2021; Mensah & Boakye, 2021) have been swift to discuss global recovery pathways, it is currently unclear when to expect a lasting recovery. For the pandemic to become manageable, i.e. for COVID-19 patients to no longer clog emergency beds, it will be necessary for a large share of the population to be vaccinated or to have recovered from an infection. As evident from Figure 27, the pandemic followed very different trajectories, involving double (India) and multiple (Spain) waves, with observable (United Arab Emirates) and inconclusive vaccination-effects.



Figure 27. Infection trajectories in four different countries. Source: WHO (2021)

Depending on the situation, national tourism systems have been affected by travel restrictions, lockdowns, quarantines, and mandatory testing, creating volatile and unpredictable business and travel environments. Notable developments included, on the demand side, the turn of business travelers to videoconferencing, as well as the willingness – in an acknowledged absence of alternatives – of significant parts of the population in industrialized countries to embark on domestic holidays (Adinolfi et al., 2020; Jacobsen et al., 2021). All the while, travel restrictions, test requirements, and quarantines made international travel complicated and demanding. This included both the 2020 and 2021 summer seasons in Europe and North

America, for example, with significant implications for shifts in spending, from which export markets profited as money was retained within national economies, while destinations suffered.

These developments are mirrored in GDP changes, which ranged from -56.3% (Macao SAR, China) to $+43.5\%$ (Guyana), and an overall global GDP decline by 3.4% between 2019 and 2020 (World Bank, 2021a). Tourism-dependent Small Islands and Developing States (SIDS) are the most affected by the crisis, with nations including the Maldives, Turks and Caicos, St. Lucia, Fiji, Barbados, Dominica, The Bahamas, Antigua & Barbuda, Mauritius, Cabo Verde, Belize, Grenada, St. Kitts & Nevis, or Seychelles all reporting a significant decline in GDP, by 11% (Seychelles) to 32% (Maldives) (World Bank, 2021a). Figure 28 illustrates this relationship for the least/most affected nations, showing that, as a general principle, a greater economic reliance on international tourism has resulted in more substantial GDP losses. Tourism-dependent (long-haul) destinations in particular are vulnerable to disruptions in global traveler flows.

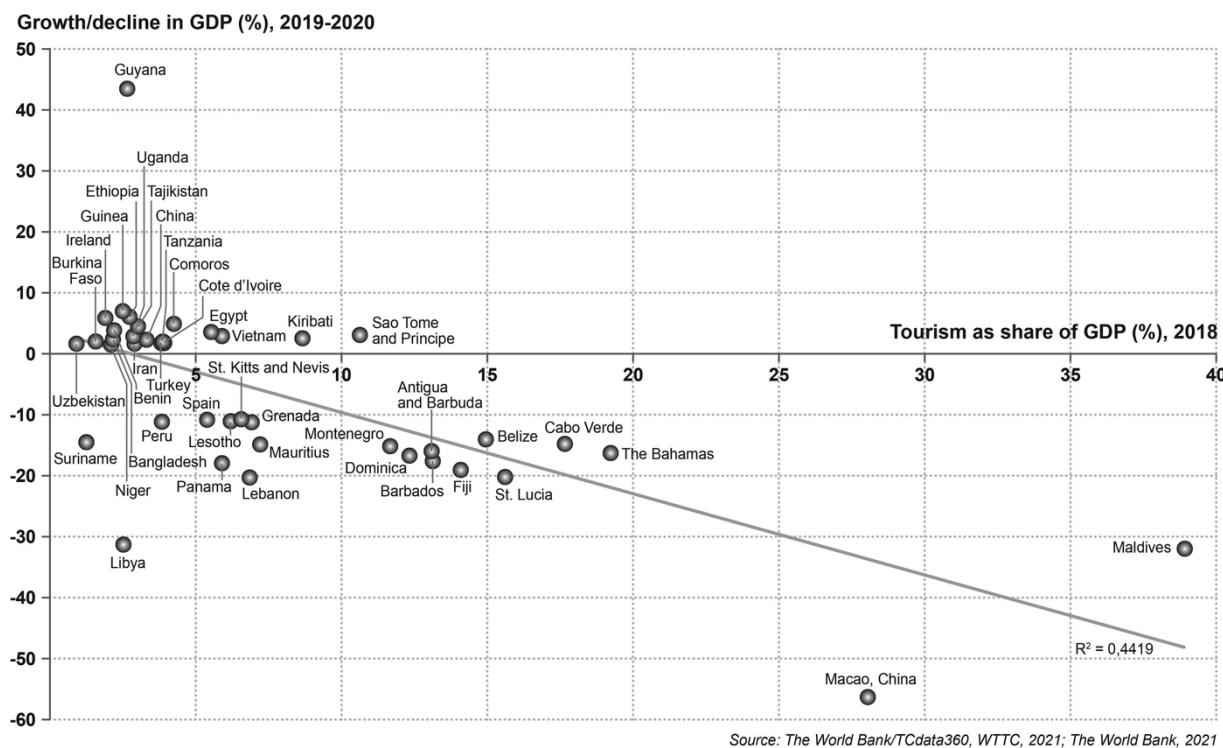


Figure 28. Tourism dependence and growth/decline in 2020 GDP. Source: The World Bank Group, 2021a, 2021bb, WTTC, 2021b (own illustration).

On the supply side, impacts on tourism have included bankruptcies and new debt, specifically among airlines and cruise operators (ITF OECD, 2020; OECD, 2021). ITF OECD (2020) estimated that in October 2020, the maritime shipping industry had already received €8.3 billion in support packages; while loans and guarantees, fiscal transfers, equity and hybrid debt forwarded to the aviation sector amounted to €119.8 billion (March 2020 to March 2021)

(OECD, 2021). These amounts are notable bearing in mind difficulties to find funding for climate change mitigation. For comparison, the EU LIFE Climate Change Mitigation and Adaptation program is endowed with grants amounting to €0.9 billion over the period 2021-2027 (EC, 2021a).

Tourism businesses responded to the crisis with product diversification, rebates, workforce reductions, and new marketing strategies (Rogerson, 2021; Sharma et al., 2021), though it seems clear that the effects of income losses and new debt will be felt for a considerable time. Employment in tourism was also affected by restrictions, closures, and re-openings causing on-off employment situations. Self-victimization prevailed, with for instance airlines repeatedly presenting themselves as victims of the pandemic, omitting that they acted as carriers of the virus (Gössling et al., 2021), accelerating the spread of new strains such as Delta or Omicron.

Self-victimization is evident in the sector's communication. In 2020, the World Tourism Council (2020) suggested that in excess of 100 million jobs in tourism were at risk. In comparison, the Airports Council International saw 46 million aviation and tourism jobs at risk, or 43% of the 87.7 million jobs supported by "aviation and the tourism it facilitates" (ACI, 2020: no page). The WTTC (2021c) later concluded that 62 million tourism jobs were lost in 2020. However, not all employment was "lost". Many countries observed fluctuations in workforce entries and exits (Tourism HR Canada, 2021). Significant shares of the tourism and hospitality workforce sought (and found) new employment, with for example one fifth of gastronomy workers in Germany (Grundner, 2021) and 15% of those in Austria (ÖGZ, 2021) leaving tourism employment. The re-opening tourism economy then presented the sector with problems of finding staff (Zukunftsinstut, 2021).

Beyond this more descriptive discussion of the crisis and its outcomes, there are more profound lessons to be learned. As has been proposed earlier (Gössling et al., 2021) and echoed by others (Cole & Dodds, 2021; Prideaux et al., 2020; Sigala, 2020), COVID-19 should be considered an analogue to climate change. There are differences: the pandemic erupted within a few months, while climate change has been acknowledged as an ongoing crisis for decades. The effects of COVID-19 became immediately felt on a global scale, while climate change impacts have mostly had local or regional relevance, for instance in the context of flooding events, storms, wildfires, or heat waves (UNCCS, 2019). Yet, there are commonalities. With expectations that climate change will be more economically and socially disruptive than the pandemic, as well as largely irreversible, it is meaningful to study the pandemic with a view to gain insights for the management of climate change.

7.2 Method

In response to the COVID-19 pandemic, significant numbers of academic papers have been published across all fields. In tourism studies, articles were published within months of the outbreak. Tourism academics have engaged in “response research” before, for instance in the context of terrorism (Krajňák, 2020), disruptions such as Airbnb (Guttentag, 2019), or overtourism phenomena (e.g. Milano et al., 2019). However, the speed of the academic response as measured in paper output is unprecedented, as platforms such as Google Scholar already list thousands of articles on the topic.

To consider the insights that have so far accumulated, the paper sets out with a discussion of the literature on tourism and COVID-2019. Two reviews of the field have already been published, by Yang et al. (2021) and Zopiatis et al. (2021), and this paper does not seek to provide a third systematic or thematic review. Rather, key insights as already presented by Yang et al. (2021) and Zopiatis et al. (2021) are complemented with an integrative review, based on reflexivity, more selective foci, and problematization (Alvesson & Sandberg, 2020). To achieve this, a sample of papers is considered, including all papers that cite Gössling et al. (2021), as one of the earliest comments on the pandemic. The sample includes papers published between April 2020 and September 2021 ($n = 1,953$), accessed through Google Scholar’s tracking function that links each citation to a source. This process revealed a large number of references in reports and other non-academic outputs, which are excluded, reducing the number of items published in journals or in book chapters to $n = 589$. Papers were then assessed on an individual basis to determine their relevance. “Relevant” here refers to either new themes or interpretations of content that add to insights as presented by Yang et al. (2021) and Zopiatis et al. (2021). The process is subjective and was carried out individually by the two authors to ensure that the discussion would be as inclusive as possible.

As highlighted by Zopiatis et al. (2021) and Yang et al. (2021), many tourism and COVID-19 publications are characterized by poorly conceived methodologies, speculation, “promotion” of individual research agendas, personal bias, and ethical and academic integrity issues” (Zopiatis et al., 2021, p. 279), as well as a “a lack of theoretical engagement” (Yang et al., 2021, p. 14). Their relevance for tourism studies is limited, because many are commentaries, short communications, or using “available” datasets (Yang et al., 2021). This calls for a different approach to interpretation. Here, we turn to a critical geography perspective (Bauder & Engel-Di Mauro, 2008), complemented with perspectives founded in political science (Marsh & Stoker, 1995). Critical geography is explicitly normative and seeks to connect theory and

practice, in connection to space, and in discussing bi-directional outcomes of human interaction with Earth systems. This represents a wider perspective on economic-social-environmental systems, here combined with a view on the implications for state and citizenship. Links to tourism are detailed, heeding the call for tourism studies to be critical and transformative (Ateljevic et al., 2011), and with the explicit purpose of deconstructing the dynamics of crises that act, and will act, as barriers to considered responses. In deconstructing the general understanding of key tourism institutions (and some academics) that a tourism rebound is desirable – even with the caveat of “building back better” (UNWTO, 2021), – a key endeavor is to excavate insights that have relevance for the management of climate change.

Climate change has been described as a “super wicked” problem, because of the limited time left to decarbonize the world economy; the dilemma of those causing the problem also being the ones in charge of defining the solutions; the lack (or weakness) of a central authority to address the problem; and the discounting of the future in policy responses (Levin et al., 2012).

Cole and Dodds (2021) propose that these aspects also characterize pandemics, while climate change, biodiversity loss, land-use change, and the emergence of novel infectious diseases also interact in self-reinforcing ways. To link the ongoing crisis to unabated climate change futures is thus meaningful, as this will improve the understanding of the complexity of the challenge humanity needs to prepare for.

The paper probes a national policy response, in Germany, as most insights in regard to crisis management may be derived at this scale of analysis. The country is one of the world’s most important tourism export markets, and its volatile management interventions in the unfolding crisis are well documented in the media. The paper also discusses outcomes for the democratic nation state and its foundation (constitution, fundamental rights, public trust). Throughout, linkages to tourism are considered and highlighted.

Any discussion of a crisis cannot avoid specific viewpoints, and alternative narratives are possible. Even though the authors have sought to balance their perspectives within the normative dimensions of climate change – the global consensus that warming be limited –, views as to how the pandemic is to be evaluated in regard to this phenomenon may vary, and subjectivity in interpretation is acknowledged here.

7.3 What we have learned

Two review papers have sought to structure the great number of tourism-related COVID-19 papers that have appeared over the past 18 months. Zopiatis et al. (2021) evaluate n=362

articles and identify three distinct themes: impacts of the pandemic on the tourism industry; post-COVID recovery perspectives; tourist perceptions and behaviour. In concluding that the research focus of COVID-19 and tourism research is narrow, the authors outline six research gaps. The first relates to workforce (“human resource management”). Since the review was published, a number of publications have addressed this aspect, for instance in terms of psychological pressure on employees (Chen, 2021; Ozdemir, 2020; Said et al., 2021). Another gap, “finance and economics”, refers to changes in tourist spending, investor confidence, corporate financial tools – including bankruptcy models –, and the impact of government stimulus and aid packages (Zopiatis et al., 2021: 279). This gap has significant relevance, as new debt will determine economic vulnerabilities, competitiveness, and price levels – all with great relevance for the future of tourism. State aid in its different forms means that governments, banks and investors are now financially involved in tourism sub-systems, specifically cruises and airlines. To probe these interrelationships has considerable relevance for climate change, as this may mean that transport companies have to show greater commitment on mitigation, or, as governments seek to return to pre-pandemic volume growth models, growing conflicts with decarbonization goals.

Research gaps related to “education and research” comprise “post-pandemic research agendas and paradigm shifts, educational technologies, experiential learning activities, and the expansion of the discipline’s conceptual boundaries via the development of a post-COVID curriculum” (Zopiatis et al., 2021, p. 279). “Marketing” covers “expectations, perceptions and attitudes of post-pandemic travelers”, such as those related to travel interest, risk perceptions, or psychological effects on travelers (*ibid.*: 279). Some of these aspects have been covered in the meantime (Byrd et al., 2021; Dedeoğlu & Boğan, 2021; Meng et al., 2021; Villacé-Molinero et al., 2021). In the context of “operations”, digitalization, robot use, health and safety practice, as well as yield and revenue management are listed as gaps, along with more general issues of innovation. Again, some of these topics have received attention, such as health and safety practices (Khatib et al., 2020; Rosemberg, 2020). Last, “destination” gaps include image restoration, post-pandemic crisis management, as well as “politics and government interventions, sustainability and transformation, and operational strategies for travel service providers (intermediaries)” (Zopiatis et al., 2021, p. 279). This is a rather large field. “Sustainability” alone comprises, in the context of this paper, issues as diverse as post-COVID net-zero emission trajectories (Scott & Gössling, 2021), the decline in specific travel segments such as business travel, along with emissions (Le et al., 2020), and the rise in virtual travel interest (Lu et al., 2021; Zhang et al., 2022); growing pressure on ecosystems as a result of

changing interest in outdoor activities (Jackson et al., 2021; Mutz & Gerke, 2021; Schweizer et al., 2021), declining pressure on ecosystems as a result of lockdowns (Lele et al., 2021), or loss of income for protected areas in emerging economies (Smith et al., 2021).

Yang et al. (2021) analyze $n=249$ papers on tourism and COVID-19 and identify five major research themes. These include (i) psychological effects and behavior; (ii) responses, strategies and resilience: organization and government; (iii) sustainable futures; (iv) impact monitoring, valuation and forecasting; and (v) technology adoption. Yang et al. (2021) confirm that many of the articles and commentaries are descriptive. They also propose that the field of tourism studies is caught in a binary of “recovery” and “reform”, with contrasting viewpoints that either support a return to the volume-growth tourism model of the past or that advocate for its transformation (*ibid*). Yang et al. (2021, pp. 11–12) also bemoan that “few [authors] offer a clear path forward for the industry”, recommending that “scholarship be more reflective of the role of the pandemic in transformative tourism rather than aiming for transformation as an outcome of the pandemic”. This latter suggestion reflects on the importance of distinguishing theoretical vis-à-vis applied research contributions. Against the background of climate change, all the evidence is that tourism needs to transform if it is to remain a viable option for future generations (Scott et al., 2019). Indeed, much cited commentaries have echoed this sentiment (Sigala, 2020). At the same time, the pandemic has implied changes that are transformative of tourism, as exemplified by the decline in business travel and the widespread adoption of videoconferencing.

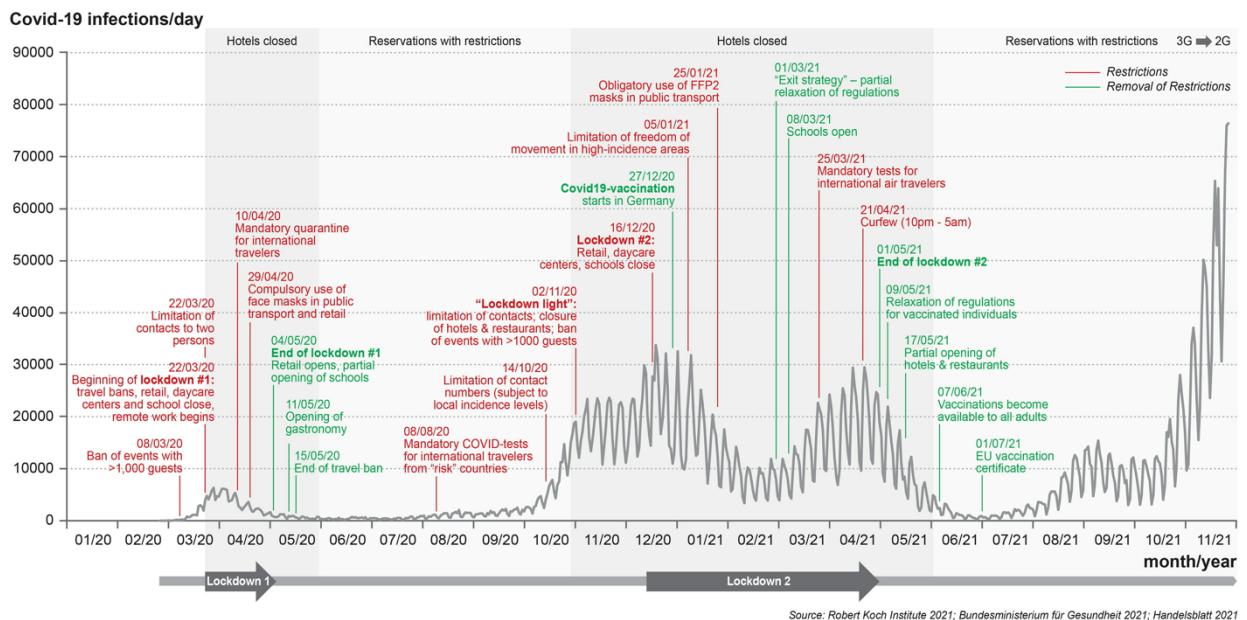
Our own integrative analysis suggests that various of the gaps proposed by Zoppiatis et al. and Yang et al. (2021) have started to fill. We also find that a large share of papers is concerned with responses (Kreiner & Ram, 2021; Pham et al., 2021; Sharma et al., 2021; Zhang et al., 2021) and rebound (Dube et al., 2021; Rasoolimanesh et al., 2021; Vu & Hartley, 2021), even though many recovery-related findings are premature, in the sense that it is not as yet clear how long the crisis will last, whether behavioral change is permanent, or what the new economic realities of travel and tourism will be. The following section is thus concerned with a meta-perspective that interprets COVID-19 related findings in the wider context of governance in times of crisis. Further findings from the integrative review are introduced here.

7.4 What we should have learned

7.4.1 “Crisis management” – or “panic”? A national perspective

Crisis and disaster management is an established field in tourism studies that has focused on the analysis of and responses to events ranging from earlier pandemics, to terrorism, military coups, or environmental disaster (Ritchie, 2004). Berbekova et al. (2021) distinguish eight major themes in the crisis literature, including vulnerability & resilience, outcomes, tourist perceptions, models, marketing, communication, media relevance, and dark tourism. Pathogen distribution has been discussed in various contexts, highlighting the role of modern transport systems, specifically aviation, as vectors (Gössling, 2002; Hall et al., 2020). While several highly problematic incidences of virus distribution have occurred in recent years, COVID-19 proved altogether more difficult to contain because of its characteristics of being highly contagious, yet difficult to detect in early stages; the emergence of new virus strains; and the comparably costly and time-consuming treatment of a share of patients, and relatively high fatality rates. This led to heterogeneous responses by national governments. The following analysis discusses developments as these unfolded in Germany.

Germany moved through five infection waves over the first 20 months of the pandemic, to which it responded with two lockdowns, business and school closures, and event and activity bans (Figure 29). Tourism, including incoming, outgoing, and domestic travel, was affected by travel restrictions, quarantines and test mandates. Virtually all measures were implemented on an ad hoc basis, trailing infection rate developments. In March 2020, comparably low infection levels led to a first lockdown, with a palpable nervousness in the population, as evident in clearance sales of toilet paper (Spiegel, 2020). This phenomenon was also reported in other countries and repeated itself before the second lockdown in October 2020. It had such significance that it became a topic of research on personality types (Garbe et al., 2020), and suggests that the crisis was considered existential by many people.



Source: Robert Koch Institut 2021; Bundesministerium für Gesundheit 2021; Handelsblatt 2021

Figure 29. COVID-19-related restrictions and their impacts on tourism, Germany. Own illustration. Source: Bundesministerium für Gesundheit, 2021; Handelsblatt, 2021; Robert Koch Institut, 2021

Major tourism-related developments included the repatriation of Germans on holiday in other countries, at a cost of €94 million, in March 2020. A majority of the 240,000 travelers later refused to pay a share of this cost, not considering themselves liable (Euronews, 2020). Tourists also endured other inconveniences. Travelers arriving from red list countries or testing positive for COVID-19 were held in “quarantine hotels”, and had to pay accommodation bills (The Guardian, 2021a). Travelers trapped onboard cruise ships generated global media headlines (Cruise Law News, 2020; Sekizuka et al., 2020). Changing restrictions and rules, and the economic losses and cancellations these entailed also caused a flurry in lawsuits, including a supreme court decision on the legality of COVID-19 actions as taken by government (Bundesverfassungsgericht, 2021). The supreme court however concluded that lockdowns and other actions by government were backed by the constitution.

In the first year of the pandemic, significant financial support was forwarded to companies and individuals, with a cost of €397.1 billion to Germany’s Economic Stabilization Fund. The total cost of the pandemic, including lost revenue, is estimated at €1.3 trillion (ZDF., 2020a), a sum that does not include the cost of hospitalizations and vaccinations, mental health issues, or lost education. The cost of the pandemic can be compared to the German pre-pandemic GDP of €3.473 trillion (in 2019; Destatis, 2020), revealing the very significant new debt the crisis has incurred for nations. Notably, while inflation already affects low-income households, the fortunes of the very wealthy grew rapidly during the crisis, both inside and outside Germany (UBS/PWC., 2020).

The first German lockdown ended in May 2020, when retailers opened again, and schools partially, for older students. During the summer, and up to October 2020, travel was possible within Europe, depending on rules in receiving countries; visits in “at risk” countries implied two-week quarantines. As an effect of these policies, the share of Germans holidaying at home increased considerably, possibly also because of official recommendations to stay in the country (ZDF, 2020b). As Germany is one of the largest tourism export markets and a comparably small destination for international tourists, demand exceeded supply during the summer 2020, with positive catch-up effects for tourism businesses. However, continuously changing COVID-19 rules as well as the threat of new travel restrictions represented major planning barriers for both travelers and industry (ZDF, 2020b), prompting the national hotel and gastronomy association to “demand an end of the regulation chaos” (DEHOGA, 2020, no page).

The winter period 2020/2021 saw a second lockdown, implemented when infection rates started to climb again in October 2020. Retailers, schools, and hotels had to close (in mid-December, affecting the Christmas sales period), and movement in high-incidence areas was restricted, cumulating in a curfew in April 2021. Vaccinations, which began in late December 2020, prioritized the older population, and it was uncertain when and under which conditions tourism would resume. Debates over the EU’s failure to order enough COVID-19 vaccine emerged in January 2021 (The Guardian, 2021b). It was only in June 2021 that vaccinations became available to all adults, with the implication that second jabs could only be had four weeks later, in July 2021, making summer holiday planning changes largely impossible. Demand for vaccinations was nevertheless instantaneous, and in particular younger people lined up at vaccination centers to regain travel freedoms. During the summer, travel abroad was characterized by frequently changing rules regarding border crossings, conditions for stays, and returns (negative tests, quarantines). In Germany, hotels and restaurants often required a negative test, a situation that extended over and beyond the second lockdown, with negative repercussions for many businesses. Events were banned completely. As vaccinated older people were free to travel, while families faced travel difficulties also because of specific rules regarding unvaccinated children, COVID-19 justice debates ensued (ZDF, 2021). After a relatively quiet summer with low infection rates, these again began to climb in August 2021, reaching a ratio of almost 500 infections per 100,000 citizens and day towards the end of the year. In between an outgoing and an incoming government, a strengthening of rules from “3 G” to “2 G” was the only measure to address infection rate growth at the end of November 2021, i.e. allowing only vaccinated and recovered citizens to enter non-food stores (3 G accepted

negative tests; the three German “Gs” refer to “geimpft” (vaccinated), “genesen” (recovered), or “getested” (tested negatively)).

Why is it important to recall these developments? First, it is evident that the German government’s crisis management over close to two years resembled panic behavior, defined here as an ad hoc response to a phenomenon triggered by fear. This perhaps had to be expected, as there was no guideline to rely on. The most recent pre-COVID national pandemic plan (RKI, 2017) was modelled on influenza; a document of 72 pages that offers limited insights for a crisis of COVID-19 dimensions. Hence, governmental responses had to be devised on the run, in political processes trailing the actual development of the pandemic, and with no vision as to how to end the crisis. Second, the government apparently felt that it had to justify its actions. Conservative newspaper *Die Welt* (2021) reports that scientists were pressured to develop a worst-case scenario projecting one million deaths, to stifle an anticipated public outcry in response to restrictions. This justification of the “strong state” also functioned as a mechanism to establish state authority, aided by surveillance technologies such as the Corona-warn-app tracing infection chains (downloaded 37.9 million times as of 6 December 2021, according to the developer). In restaurants and cafés, the “luca” app was used to track patrons. The pandemic consequently saw the establishment of new surveillance structures, justified on the basis of stimulated fears. Third, lockdowns and curfews may also have been considered in terms of their political appeal to the older population, with a view to this large group’s considerable influence on election outcomes. In contrast, very limited attention was given to the potential mental health impacts of lockdowns on children, teenagers, and young adults, who were barred from daycare centers, schools and universities, leisure activities, and even meetings with friends. Negative educational implications are evident (Lütje-Klose et al., 2021). Fourth, as governments scrambled to justify restrictions, many countries initially relied on the opinion of individual advisers, the state epidemiologists. Countries with alternative strategies, such as The Netherlands (initially seeking herd immunity) or Sweden (relying on citizens to heed recommendations), were portrayed as irresponsible, a process in which the media played an important role (The Guardian, 2020).

As evident from this discussion, limited preparedness to a crisis is likely to have negative outcomes, as ad hoc fear responses (Gray, 1987) are necessarily less than perfect. There is a parallel to climate change, where it took several years of hurricanes (Caribbean, USA), wildfires (USA, Australia, New Zealand, Sweden, Paraguay), or heavy rainfall (Canada, Germany) for populations to begin to understand the implications of global warming. When disaster hit, responses were devised on the run – even though risks are known (e.g., EC, 2021b). This also

holds true for tourism. As highlighted by Becken et al. (2020), there are few countries with mitigation or adaptation plans, ignoring the scientific evidence of vulnerabilities (Scott et al., 2019). In this context, the German Supreme Court's ruling gains importance, as it entitles the government to severely restrict citizen rights in the event of an existential crisis (Bundesverfassungsgericht, 2021). As climate change represents such a crisis, the ruling should have relevance for mitigation, because it underlines that governments can act, deliberately and anticipatory, if they choose to.

7.4.2 Citizen rights, the strong state, and mental health: an international perspective

The preceding sections suggest that in a crisis, there is a likely reaction of “everyone for himself” at various scales, from governments to political parties to individuals. This highlights another set of interdependent affairs, i.e. the interrelationships of border closures, restrictions of citizen rights, and concomitant outcomes for trust in government. As Cole and Dodds (2021) observe, states reacted individually rather than collectively to the pandemic, weakening international cooperation. National borders quickly became impenetrable, as freedoms of movement were curtailed. An associated risk of xenophobia became evident, as specific traveler nationalities attained pariah status. For example, Swedish tourists were refused entry to other countries, as the country’s media portrayal of succumbing to high infection-rates caused fears. For the same reason, Sweden also saw a massive decline in international tourist arrivals. The class of the wealthy, on the other hand, made headlines when it sought refuge in its private islands, to later on catch up on “lost” holiday time, relying on private air travel (The Washington Post, 2021).

Border closures, mobility restrictions, lockdowns, quarantines, curfews, and the closure of educational institutions represent significant infringements on citizen rights and civil liberties that increase economic insecurity and reduce social capital (Fetzer et al., 2021). While constitutional, measures could have been considered oppressive by civil society, with potentially negative outcomes for trust in government. For example, the large “antivaxxer” share of the population in Europe was unforeseen. As resistance to vaccinations often took very organized forms, antivaxxer stances may at least partially be explained as a form of rebellion against the state. However, in contrast to these expectations, studies have consistently found that trust in government and democracy increased during the pandemic (Bol et al., 2021; Esaiasson et al., 2021; Goldfinch et al., 2021; Gozgor, 2021; Rieger & Wang, 2021). Schraff (2021) cautions that this should be interpreted as an outcome of collective angst as a response to the existential threat of growing COVID-19 numbers, and not a support of lockdowns. Yet,

studies seem to indicate that in an existential crisis, the state is expected to act, and that such action will increase trust in government. As the Financial Times (2021, no page) commented, the pandemic marks “the close of an era in which power and responsibility migrated from states to markets”.

While measures increased trust in government, lockdowns and the closure of schools also came at a very significant psychological cost. For example, social isolation and the perception of loneliness are associated with suicidal ideation (Calati et al., 2019). In the USA, the CDC (2021, 888) reports that suicide attempts of teenagers have increased since May 2020, specifically among girls. While the CDC cautions that linkages to COVID-19 are unclear, it highlights that young people have been affected by concerns as diverse as lack of connectedness, barriers to mental health treatment, increases in substance use, and anxieties in regard to family health and economic problems (CDC, 2021, p. 889). The CDC also notes that Emergency Department visits for mental health issues as well as suspected child abuse and neglect increased in 2020. Studies in the USA and UK suggest that child and adolescent eating disorder cases have almost doubled in numbers (Otto et al., 2021; Solmi et al., 2021). This is echoed in the wider literature, linking COVID-19 with psychiatric disorders, sleep disorders, depression, anxiety and distress, domestic abuse (Casagrande et al., 2020; Sher, 2020). Quarantines have also been found to affect children and parents, with symptoms including difficulties to concentrate, boredom, irritability, restlessness, nervousness, loneliness, uneasiness and worries (Orgilés et al., 2020). A representative study of the impacts of COVID-19 on youth (14-29 years) in Germany confirms negative health effects of the pandemic. It concludes that there is a perceived loss of control in this age group, with expectations that government secure a “livable”, stable economic future (Schnetzer & Hurrelmann, 2021). These findings underscore the massive mental health implications of the pandemic, which are overlooked in management responses that handle a crisis on a day-to-day basis. They also emphasize expectations that governments act.

7.5 A note on the future

The preceding discussion suggests that the global response to the pandemic has in many ways been imperfect. Governments will seek short-term system stabilization, making available significant state aid, while working towards a return to the old normal. Critical questions regarding the system’s vulnerabilities are not raised, and the interest to consider the crisis as an opportunity for change is limited, also because of industry’s powerful narratives of employment and revenue loss. Nationally, a tendency to protect “one’s own” is reflected in border closures or new rules of entry for foreign nationals. Longer-term challenges like climate change loose

relevance, and the implications of fiscal stabilization policies for future generations remain ignored. Mental health issues are overlooked. Upward distribution in the economy is accepted, as the very wealthy increase their fortunes disproportionately. While there is support of a strong state, there are also signs of polarization and radicalization, as evident in the “antivaxxers”. Science, it appears, can only contribute so much to the understanding of a crisis, underlining the importance of anticipatory planning and management.

These more general insights are reflected in tourism. Here, research indicates significant vulnerabilities, specifically in tourism-dependent economies as well as on the side of airlines and cruises. Accommodation and gastronomy also belong to the vulnerable sub-sectors, as lockdowns and test-requirements affected patron numbers and finances. The most resilient component in the tourism system are the tourists themselves, who have shown great willingness to switch to domestic holidays and to engage in new leisure activities. Virtual travel becomes more attractive, adding to the growth in gaming that was pushed during pandemic lockdowns (King et al., 2020). The crisis also caused a rise in the gig-economy, with its short-notice, pay-per-job structures. For instance, food delivery and package delivery services boomed during the pandemic (Gavilan et al., 2021). This latter trend suggests growing economic vulnerabilities.

These developments can be compared to anticipated outcomes of unabated climate change. Figure 30 distinguishes biophysical, economic, social and political dimensions, with many linkages to tourism. A shortcoming of this comparison is that there is no specific point in time at which climate change outcomes will become felt at grander scales, as this depends on emission trajectories, adaptation, and so far insufficiently understood system responses. For example, some 14% of the world’s coral reefs have already been lost in the decade 2009–2018 (GCRMN & ICRI, 2020), and there is an expectation that even under a more ambitious 1.5 °C maximum warming scenario, 70-90% of all coral reefs will disappear by the end of the century (IPCC, 2018). This will affect the livelihoods of millions, with implications for coastal tourism. Compounding this, there is a prospect of infrastructure loss due to sea level rise and extreme events (Scott et al., 2012). In Europe, scenarios suggest that snow may vanish entirely below elevations of 1200 m towards the end of the century (Marty et al., 2017). These are examples of longer-term, gradual changes that will have significant negative repercussions for tourism. In comparison, disruptive events, including storms, wildfires, heavy rainfall events and flooding, drought and heat waves will be felt more immediately and locally. The prospect is that entire countries will become less desirable as destinations, for interrelated reasons of asset

and ecosystem loss, unpredictable weather conditions, or socioeconomic instability (Scott et al., 2019).

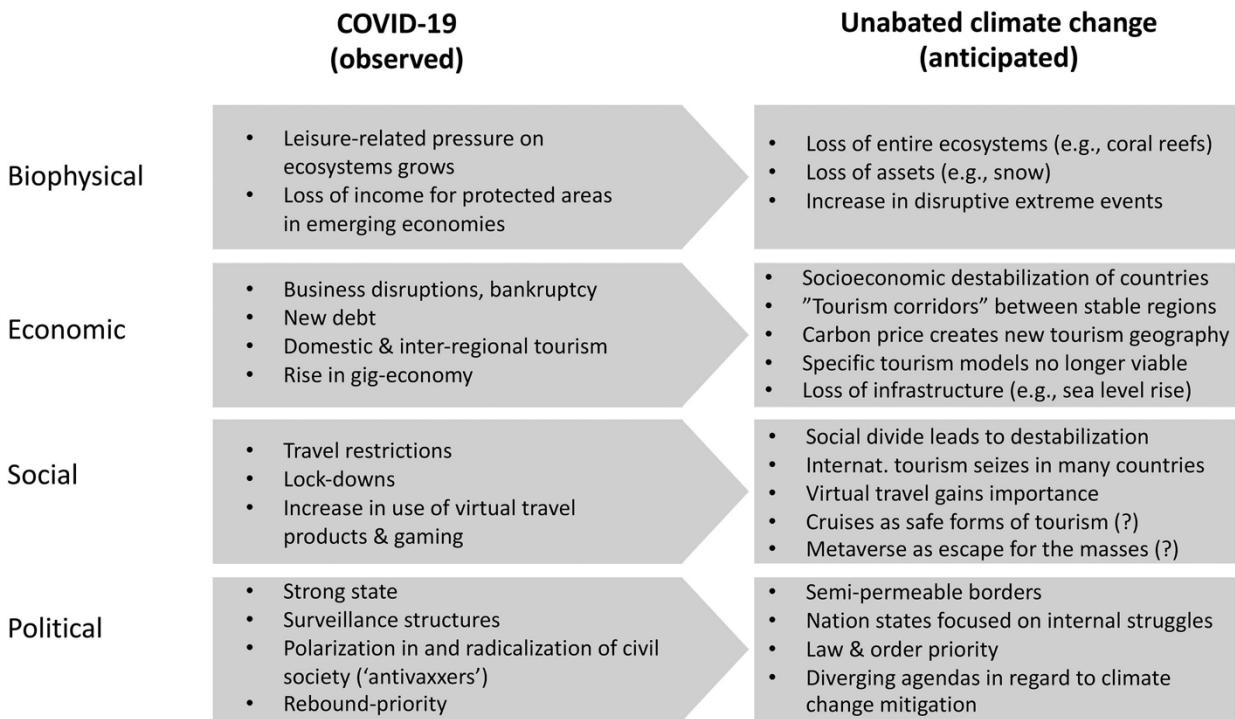


Figure 30. COVID-19 as an analogue to climate change. Own illustration.

Should there be more significant threats to socioeconomic stability as economies collapse, it is possible that tourism corridors continue to exist between the stable tourism regions, as observed during the pandemic for “low risk” destinations (e.g. UK Department for Transport, 2020). In a dystopian climate change scenario, borders may become semi-permeable, favoring those with economic resources or power. In such unstable worlds, cruises may become more relevant, as ships provide “floating safety” in controlled holiday environments (much in contrast to the current situation with continued outbreaks of the virus onboard cruise ships). Whether such holidays remain economically viable will depend on carbon policies, as cruises require vast amounts of energy and may become too expensive for mass markets. The very wealthy already own super-yachts the size of cruise ships, and there is a new model of shared ships, in which “cabins” of up to 800 m² are used by a total number of up to 100 guests in ships exceeding the size of cruise ships carrying 2600 passengers (Spiegel, 2021). These moving islands may become important destinations of the future, though for a very small share of humanity.

Travel cost, instability and anxieties related to travel may also foster virtual travel, as observed during the pandemic. This suggests a growing interest in the Metaverse and its opportunities for escape. The idea of a parallel, virtual world (the Metaverse) was originally presented in Neal Stephenson’s 1992 science fiction novel “Snow Crash”, and has since re-emerged in other

novels, such as “Ready Player One” (author: Ernest Cline, 2011). It is imaginable that the virtual world will become an increasingly more desirable place, specifically if the real world is characterized by biophysical and socioeconomic destabilization. This makes it important to understand the Metaverse as an offer of withdrawal to a “stable” world with set rules by corporate authorities. The Metaverse is the antithesis of civil society, and its opportunity and need for engagement. It is introduced at a time when a significant share of young adults no longer plan to have children (Hickman et al., 2021), the ultimate expression of distrust in the future. In many ways, the Metaverse is the anticipation, acceptance and acceleration of the real world’s decline in its biophysical, social and political forms.

With growing instability, nations may be increasingly occupied with internal struggles, as currently evident in the USA (McKay, 2021). This may lead to diverging agendas in regard to climate change mitigation: countries such as Australia or Saudi Arabia already refuse to support global mitigation efforts. Again, the overall perspective is one of growing vulnerabilities.

Will tourism stakeholders understand the challenge? Zurab Pololikashvili, UNWTO Secretary-General, proposed that:

“The crisis is an opportunity to rethink the tourism sector and its contribution to the people and planet; an opportunity to build back better towards a more sustainable, inclusive and resilient tourism sector that ensue the benefits of tourism are enjoyed widely and fairly” (UNWTO, 2021, no page).

But what does this mean in practice, “to rethink tourism”? In all of its public statements, UNWTO supports a pro-growth agenda that pays lip service to net-zero ambitions (Scott & Gössling, 2021). As Demiroz and Haase (2019) propose, systems can bounce back to the status quo, or bounce forward to a new equilibrium in response to a disturbance. It may be argued that in tourism, there is a discourse of bouncing forward and a reality of bouncing back. By implication, vulnerabilities will increase. It will take systemic change, not an improvement of existing models, to achieve climate change mitigation and to build more robust tourism systems (Gössling & Higham, 2020; Rosenbloom et al., 2020). This is the lesson that should have been learned from the pandemic: In a world that engages in serious efforts to mitigate, the global tourism economy will change (Peeters & Landré, 2011). It will also be more stable and benefit a larger number of people. This would seem a price worth paying.

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8 Synopsis

The synopsis of this dissertation is structured to synthesize the key findings from the seven studies and to reflect on their broader theoretical, practical, and methodological implications, guided by the three research questions. *First*, the main results are consolidated to answer the overarching research questions, highlighting how crises reshape the selected actor networks in tourism and the interconnections between economic, environmental, and social sustainability. *Second*, in the implications section, the methodological and theoretical contributions of this research are discussed, particularly in relation to crisis management in tourism, the Actor-Network Theory, and the Triple Bottom Line framework. This section also briefly outlines practical implications for tourism businesses, policymakers, and destination managers. This is followed by a critical reflection on methodological strengths and limitations and proposing directions for future research.

8.1 Results

In the introductory chapter, three main overarching objectives were formulated (RQ1-3). These can be aligned with the elements provided by ANT: ordering, materiality, multiplicity. Materiality helps identify and connect actors within crises (RQ1), ordering explains how crises restructure tourism and transport through sustainability dimensions (RQ2), and multiplicity highlights the different ways actors react, adapt, or resist change (RQ3).

1) Who are the key actors in the selected tourism and transportation crises and how do they interact? (materiality)

The element of materiality in ANT emphasizes that networks are composed of both human and non-human actors (van der Duim et al., 2013); it provides a useful lens for examining these interdependencies, highlighting how crises serve as catalysts for reordering relationships within tourism networks. The actors identified in the seven studies span a diverse range of human and non-human entities, whose interconnections are shaped and reconfigured through crises.

Across the selected studies, it becomes clear that crises in tourism and transportation are not shaped by human actors alone, but rather by dynamic assemblages of human, institutional, technological, and non-human entities. Tourists, policymakers, destination managers, and academics represent the human actors who interpret, respond to, and often initiate discourse around crisis events. Institutional actors such as health authorities, policy frameworks, and

destination management organizations structure formal responses and shape the governance landscape. Technological systems, including online booking platforms, social media, warning interventions, and surveillance tools, serve not merely as intermediaries but as active shapers of perception and behavior. Finally, non-human actors like extreme weather, viruses, animals, and urban infrastructure are not passive backdrops, but materially shape crisis trajectories and decision-making.

This categorization underscores the relevance of a relational, non-anthropocentric lens such as ANT, which allows for a symmetrical consideration of all actants in the crisis network. By categorizing actors not by sector or institution but by functional role and ontological type, we gain a clearer view of how crises emerge from interdependent actor constellations, and how their resolution or escalation depends on interactions across these categories. This reframing invites us to go beyond “who was involved” and ask how agency is distributed and mediated across hybrid networks.

**2) How are these crises affecting industry players and consumer behavior as framed by the economic, environmental, and social dimensions of sustainability?
(*ordering*)**

Ordering refers to the process of structuring and restructuring networks (van der Duim et al., 2013) – in this case, how crises disrupt and reconfigure tourism and transport systems along economic, environmental, and social dimensions. Crises act as turning points that reconfigure actor relationships, challenging traditional roles and making previously invisible actors newly salient. For example, in the studies on Covid-19 (P6, P7), digital platforms transition from being seen as neutral infrastructure to becoming strategic agents of data control and behavioral influence, as accommodation providers increasingly rely on their analytics to adapt to changing tourist preferences. Similarly, in the wildlife tourism context (P1, P2), animals and biodiversity gain new discursive presence, shifting from scenic backdrop to moral subject and symbol of systemic neglect, particularly when mediated through academic narratives.

Moreover, the agency of tourists shifts dramatically across cases: from passive consumers (P6) to moral actors and empowered digital publics (P3, P4), using social media to articulate accountability claims and co-construct destination reputation. These reconfigurations suggest that crises not only expose system vulnerabilities, but also redistribute visibility and voice, elevating new actors. A crisis-sensitive analysis should therefore move beyond actor

identification to focus on how roles are fluidly reshaped in the crisis moment, revealing underlying power structures.

Economic Impacts

Two key insights regarding economic impacts emerge from the case studies examined in this dissertation. First, economic circumstances shape the tourism actors' reactions to various crises: In P1 and P2, economic pressures, particularly in tourism-dependent economies, may facilitate animal welfare violations, as tourists' spending patterns and preferences directly influence welfare outcomes. Solutions in the forms of regulatory shifts toward stricter animal welfare policies could impose financial constraints on wildlife tourism operators but may also temporarily deprive economically disadvantaged animal owners in tourism destinations of their livelihoods (Stone & Nyaupane, 2017). In parallel vein, the studies in P3 and P4 have highlighted how one-sided focus on profit maximization may lead to opportunistic mismanagement with little consideration of human well-being and facilitate incisive, immoral outcomes. Conversely, consumer boycotts and reputational damage following reckless behavior may then lead to revenue losses, although such an analysis is beyond the scope of this dissertation.

A second observation concerns the financial strain triggered by the Covid-19 pandemic, which caused severe losses in the tourism sector, particularly in small, tourism-dependent economies, resulting in long-term disruptions to employment and business models (P7). These pressures illustrate a persistent tension within sustainability governance, where economic concerns often override or delay environmental goals (Ekins, 1993). In the case of urban transport policy (P5), resistance to sustainable mobility is frequently framed in economic terms, with car-owning groups employing self-victimization narratives that amplify public anxieties and slow down policy implementation.

Environmental Impacts

Such financial constraints may therefore impact the implementation of sustainable transformation, e.g., in the transport sector (P5), which plays a critical role in tourism's environmental footprint (Peeters et al., 2019). Studies have shown that urban mobility policies can significantly reduce carbon emissions (Nieuwenhuijsen, 2020). However, their implementation often faces political and societal resistance, highlighting a broader challenge in societal acceptance in environmental sustainability.

Further, the tourism industry's environmental impact extends beyond carbon emissions, encompassing biodiversity loss, habitat destruction, and ecosystem degradation, as discussed in P1 and P2. The continued demand for wildlife-based tourism experiences - often with poor animal welfare standards - contributes to environmental degradation, placing further strain on already fragile ecosystems. Despite growing awareness, research and policy interventions remain fragmented, with significant gaps in interdisciplinary integration and practical solutions to address these issues. A more holistic approach to sustainability, incorporating both ecological and ethical considerations, is necessary to mitigate tourism's role in biodiversity loss. Some scholars have argued that the Covid-19 pandemic would represent a pivotal moment for wildlife tourism, trade, and endangered species - a "watershed moment in global awareness" (Newsome, 2021, p. 298) regarding sustainability and biodiversity vulnerabilities; however, truly disruptive changes in the post-pandemic industry have yet to materialize.

Social Impacts

As a key insight into the social dimension, it becomes evident that crises are highly interconnected (see RQ1). For instance, research indicates that habitat loss and environmental degradation, partly driven by tourism, can contribute to biodiversity decline and increase zoonotic disease risks, with potential implications for human health (Carlson et al., 2022).

Second, the link between sustainability and societal well-being also emerges in the context of urban transport policies (P5). Although measures aimed at reducing CO₂ emissions may offer public health and quality-of-life benefits, they frequently encounter political pushback. Some populist and right-wing actors have framed such policies as restrictive or elitist, turning them into sites of ideological contestation. This underscores the tensions between environmental governance and social acceptance.

Third, social crises in the tourism sector often bring questions of ethics, accountability, and public trust to the fore. As shown in P3 and P4, management failures under crisis conditions can pose risks to visitor safety and provoke strong public responses, including calls for boycotts and regulatory changes. Social media serves as a key mechanism for amplifying such reactions and pressuring stakeholders. These dynamics highlight the importance of transparent governance.

To summarize, the TBL framework aligns with ANT's recognition of interwoven human and non-human agency. Economic, social, and environmental dimensions interact dynamically, with crises continuously reshaping the balance of power among actors in tourism networks.

3) What strategies do stakeholders use to mitigate negative impacts and promote resilience? (*multiplicity*)

Multiplicity in ANT suggests that there is no single, fixed reality (van der Duim et al., 2013), but rather multiple, coexisting ways in which actors perceive, experience, and respond to crises. According to ANT, adaptation strategies of the selected tourism actors therefore are shaped by their position within the network, their agenda as well as the scale and nature of the crisis. The case studies demonstrate divergent crisis adaptions – embracing the pandemic “new normal”, reverting to pre-crisis models, or fighting urban transport transformation. This variation in responses shows that adaption is not uniform but contingent on different actors, contexts, and network configurations.

Tourism businesses and destination managers in the case studies adopted largely tactical responses to reputational threats and market shifts; however, it is important to note that a longitudinal analysis was not part of the dissertation. In the context of service failure (P3 & P4), crisis communication strategies aimed to contain consumer backlash, primarily through social and traditional media. During the Covid-19 pandemic (P6 & P7), hygiene upgrades (e.g., implementing enhanced hygiene measures to align with shifting traveler preferences (Rawal et al., 2020; Zhong et al., 2021)) and digital transformation could reflect short-term responsiveness rather than systemic change. Indeed, scholars found that the broader tourism system continues to prioritize short-term economic recovery and sustained growth over long-term resilience and sustainability (Higgins-Desbiolles, 2018). This indicates that, while crises may disrupt existing actor relationships, they may not necessarily lead to systemic change unless reinforced by sustained policy interventions and industry-wide commitments.

Policy responses within the case studies seem to be characterized by reactive governance and contested authority. Sustainable transport initiatives (P5) were obstructed by ideological opposition, particularly from populist actors who framed environmental policy as elitist. The role of policymakers in the studies in crisis response is marked by both ambition and constraint. In some cases, opposition has escalated into threats against individual policymakers, demonstrating how sustainability policies can become highly politicized and vulnerable to

revocation. Covid-related government actions (P7) revealed institutional fragility, as crisis preparedness seems to have remained limited, and decision-making was driven by short-term political pressure rather than strategic foresight.

Tourists and publics played a dual role as both subjects and agents of crisis. On the consumer side, sustainability awareness is increasing, but behavioral change remains inconsistent (ElHaffar et al., 2020). Despite growing moral awareness (P1 & P2), consistent behavioral change seems to be limited, although such an analysis was not undertaken in the realm of this dissertation. However, digital activism (P3) enabled consumers to mobilize reputational pressure on businesses, amplifying public discontent and accelerating accountability dynamics (Cammaerts, 2015). Large-scale consumer boycotts can result from collective dissatisfaction and outrage, demonstrating how digital platforms amplify public responses to crises. While such activism can pressure businesses into corrective actions (Nøjgaard, 2023), its long-term effectiveness in driving structural change remains uncertain.

8.2 Implications and concluding remarks

This dissertation provides important methodological, theoretical, and practical contributions to sustainability research in tourism. First, the methodological contributions of the individual studies are briefly synthesized. Subsequently, the theoretical implications on relational power dynamics and post-anthropocentrism perspectives are presented, followed by a condensed selection of practical implications.

8.2.1 Individual methodological contributions

This dissertation employs a diverse array of methodological approaches to examine sustainability challenges in tourism and transport networks, offering significant contributions to the field through novel analytical techniques and interdisciplinary applications. While the individual methodological contributions are outlined in full length in the individual studies, the main methodological contributions are summarized subsequently.

In P1, a bibliometric co-occurrence analysis is applied to systematically examine how animal welfare is conceptualized within tourism research. This study represents the first bibliometric analysis conducted in the fields of tourism and animal welfare research. It incorporates studies on animal welfare outcomes and tourism in various scientific disciplines and therefore allows for a holistic overview over the issue. This method hence allows for the identification of

dominant research streams and overlooked topics, providing a structured foundation for future interdisciplinary studies integrating tourism, ecology, and ethics.

P2 introduces the Single-Category Implicit Association Test (SC-IAT) to tourism research to assess tourists' subconscious attitudes toward close wildlife interactions. This method, rarely applied in tourism research, demonstrates how implicit attitudes can be influenced by warning interventions, highlighting the potential for behavioral change through targeted messaging. As a significant contribution, this study successfully standardized different indicators of implicit and explicit scales using Cohen's d , thereby enabling a comparison of effect sizes. Additionally, the introduction of the Animal Attitude Scale is a novel contribution to the investigation of implicit attitudes towards animals and animal activities.

P3 and P4 employ social media data mining techniques, including topic modeling and sentiment analysis of big data, to investigate public reactions to crises such as immoral service failures. P3 advances tourism crisis management research by leveraging machine learning and text mining to analyze real-time tourist perceptions from social media, addressing a gap in secondary data analysis. By integrating Fink's crisis model with the Emotional Stages of a Disaster framework, it offers a novel approach to understanding crisis-induced emotional shifts and attribution narratives. P4 makes key methodological contributions by integrating sensemaking theory with mediation and moderation models to analyze tourists' psychological and behavioral responses to service failures. By employing statistical modeling, it examines how perceived betrayal and anger mediate the relationship between online negative destination experiences and retaliatory behaviors while also assessing the moderating role of tourist–destination relationship quality.

P5 applies discourse analysis and policy framing techniques to explore how populist narratives shape public opposition to urban transport reforms. Methodologically, this study contributes through its application of critical discourse analysis to social media discussions around urban transport policies. By using Fairclough's three-dimensional framework, the study explores the relationship between language, power structures, and societal issues, providing a nuanced understanding of public attitudes toward these policies. Through inductive coding, it identifies recurring discourses and themes, as well as their interconnections. This approach aids in understanding resistance to sustainable transport policies, revealing the role of digital rhetoric in shaping policy debates.

P6 employs time series analysis of online accommodation reviews, using seasonal-trend decomposition to track changes in traveler preferences before, during, and after the Covid-19 pandemic. This study makes key methodological contributions by applying time series analysis to unstructured user-generated content, specifically online travel reviews, to decompose seasonal, trend, and disruption effects. Unlike traditional approaches that rely on "hard data" like revenue or sales, this method uncovers temporal shifts in accommodation feature preferences, distinguishing between long-term trends and short-term disruptions. This novel application demonstrates the potential of time series analysis for understanding evolving consumer preferences in tourism, offering a scalable approach for future research on market dynamics and sustainability trends.

P7 employs a qualitative meta-approach, synthesizing insights from academic literature, policy documents, and media reports to evaluate the tourism sector's response to the Covid-19 crisis. Its methodological contribution lies in its integrative review approach. Instead of a systematic review, an analysis of early works, alongside a critical geography perspective and political science theories, is employed to offer a broader understanding of the crisis and its implications for tourism and climate change. An additional contribution of this study lies in demonstrating how the Covid-19 crisis and climate change can be treated analogously, drawing a parallel between the two global crises.

8.2.2 Theoretical implications

While each individual study outlines its theoretical contributions, two overarching implications emerge when viewing the dissertation as a whole: (1) the relational nature of power in tourism crisis contexts, and (2) the need to expand justice considerations beyond the human domain.

Relational power shifts in crisis contexts. By applying ANT as a meta-framework, this dissertation emphasizes that power in tourism networks is not static or actor-bound, but relational and contingent (Albrecht, 2013). Crises such as the Covid-19 pandemic (P5, P7) or tourism-related service failures (P3, P4) reveal how actor configurations are destabilized: governments, businesses, tourists, and local communities continuously re-negotiate their roles and influence. For instance, findings from the #BoycottMurree case (P3) illustrate how tourists, empowered by social media platforms, challenge traditional governance through bottom-up pressure. ANT provides a useful lens here, highlighting how both human (e.g., users) and non-human actors (e.g., algorithms, hashtags) shape discourse and outcomes. Moreover, across several studies (e.g., P6, P7), economic priorities often override social and environmental

concerns during recovery processes, underscoring the tension inherent in the Triple Bottom Line logic (Elkington, 1997) and revealing structural biases towards economic resilience.

Extending justice beyond the human. A second implication concerns the conceptual boundaries of justice definitions in tourism. While social sustainability often focuses on human well-being, findings from studies P1 and P2 foreground the ethical tensions of wildlife-based tourism. Tourists' ambivalence towards animal welfare (P2) and the invisibility of animal interests in tourism discourse (P1) call for an expanded justice framework that includes non-human actors. This aligns with recent scholarship in posthumanist tourism studies (Cohen, 2019; Fennell & Sheppard, 2021) and complements ANT's inclusive ontology. ANT does not assign moral value per se but sensitizes researchers to the presence and effects of non-human actants, such as animals, environments, or material infrastructures, in shaping tourism realities. Traditional perspectives in tourism and sustainability focus primarily on community well-being, labor rights, and cultural preservation (see e.g., Diekmann & McCabe, 2011). In this sense, the findings underscore the importance of acknowledging animals not merely as tourism objects.

8.2.3 Practical implications

Finally, the combined findings of this dissertation have practical implications for various stakeholders in the tourism sector. While the individual practical implications have been discussed in each individual article, learnings on a meta level, including adapting to intersecting crises, reputation management, and resilience building, are outlined subsequently.

Integrating systemic crisis interdependencies into tourism governance

This dissertation demonstrates that crises in tourism are rarely isolated events. Empirical findings (P1, P5, P7) show that environmental degradation, public health threats, and socio-economic instability are interconnected, requiring integrated crisis management. For instance, biodiversity loss and habitat destruction (P1) increase zoonotic risks, while the Covid-19 pandemic (P7) triggered economic shocks that challenged tourism resilience. Consequently, effective governance should move beyond sector-specific strategies toward coordinated policy responses that align environmental, economic, and public health goals (Zang et al., 2021; Schneider et al., 2021).

Resistance to sustainability policies, as seen in P5, often stems from perceived inequalities and populist narratives that frame environmental reforms as elitist. This highlights the need to

communicate social and economic co-benefits (e.g., health, jobs, urban quality of life) and to adopt inclusive, participatory governance models (Newig et al., 2018). Several studies (P3–P5) implicitly underline the importance of early stakeholder engagement and strategic communication to counter misinformation and build trust. Public participation is crucial, as resistance often stems from a perceived lack of inclusion in decision-making processes. Engaging local communities and tourism stakeholders early through participatory governance models, under the right conditions, may improve policy acceptance (Fung & Wright, 2001; Newig et al., 2018).

In sum, tourism crisis governance should address both structural vulnerabilities and social divides. Crises not only expose system fragility but also reconfigure actor relations. Understanding these dynamics is key to embedding sustainability and resilience into the operational core of tourism systems, rather than treating them as reactive add-ons.

Reputation management in crisis contexts

The findings of this dissertation (particularly P3 and P4) demonstrate that tourism crises involving unethical service practices can trigger strong emotional responses among tourists, including feelings of betrayal, anger, and calls for boycotts. As seen in the #BoycottMurree case (P3), negative perceptions of a destination can spread rapidly via social media, causing severe reputational damage. Similarly, Study P4 shows that such crises can lead to behavioral consequences like revenge intentions, particularly when trust has already eroded.

Reputation management thus becomes a central task in contexts where proactive crisis prevention fails (Christensen & Lægreid, 2020; Insch & Avraham, 2014). The findings suggest that building strong tourist-destination relationships may offer some protection, as loyal tourists exhibit greater resilience to negative incidents (P4). This highlights the importance of long-term trust-building as part of destination strategy (Greyser, 2009).

In practical terms, businesses and DMOs should ensure transparent, timely communication during crises and act accountably in the public eye. As studies and prior literature show (Greyser, 2009; Helm & Tolsdorf, 2013), crisis communication that acknowledges fault, conveys empathy, and addresses stakeholder concerns can mitigate reputational risks. Ethical failings, such as exploitative pricing or neglect of community interests, cannot be resolved by PR alone but require substantive behavioral and policy responses.

Resilience building in tourism governance

The concept of resilience - defined as the capacity of systems, communities, or organizations to absorb shocks while maintaining core functions and adapting to change - has gained prominence in tourism scholarship (Cochrane, 2010; Luthe & Wyss, 2014), particularly in light of the Covid-19 pandemic (Ntounis et al., 2022; Sharma et al., 2021). Studies such as P7 demonstrate how fragmented and reactive government responses often failed to build systemic resilience, focusing instead on short-term stabilization. This supports Sharma et al. (2021), who emphasize the need for anticipatory governance and institutionalized crisis preparedness. Beyond individual business innovation, coordinated collaboration at local and regional levels is essential for building adaptive capacities (Sharma et al., 2021; Traskevich & Fontanari, 2023).

Resilience is equally critical in the context of climate change, which poses long-term risks to destination sustainability through extreme weather events, rising sea levels, and shifts in demand patterns. As highlighted in the literature (Becken, 2013; Scott et al., 2016; Dogru et al., 2019), the tourism industry remains disproportionately vulnerable, particularly in low-income regions where adaptive capacities are weakest (Dogru et al., 2019). Findings from this dissertation (P6, P7) suggest that climate resilience requires structural transformation beyond mitigation: integrating environmental risk into planning, fostering low-impact tourism niches (e.g., ecotourism), and leveraging international agreements such as the Paris Accord to enhance cross-border collaboration (Wyss et al., 2015). In this context, mobility justice (as emphasized by Sheller, 2021) should be recognized as a guiding principle to ensure that climate resilience strategies do not exacerbate existing inequalities.

8.2.4 Limitations and outlook

This dissertation employs a pluralistic, mixed-method methodological approach, based on individual case studies, integrating both qualitative and quantitative methods, including text mining, surveys, discourse analysis, and time-series analyses, to capture the complexity of sustainability crises in tourism and transport from multiple analytical perspectives. This section critically reflects on the methodological limitations of the studies included in this dissertation. While each paper makes distinct contributions to the discourse on sustainability and crisis resilience in tourism and transport, certain methodological constraints must be acknowledged. First, the individual limitations of each study are summarized, then, a meta reflection outlines key limitations, proposes potential improvements, and situates these methodological considerations within the broader research agenda.

Limitations of individual studies

The first study is restricted to peer-reviewed journal articles, excluding books and other sources that might offer additional insights. Future literature reviews could benefit from incorporating book chapters or full-text analyses. Also, the study focuses exclusively on English-language publications, which is common in bibliometric research but may overlook relevant findings in other languages. Additionally, as with any qualitative study, some degree of subjectivity in interpretation cannot be fully eliminated. However, the mixed-method approach used here helps mitigate this issue by combining qualitative review with quantitative verification. Moreover, due to the nature of bibliometric research, this study provides a snapshot of existing literature at a specific point in time, meaning that new developments and ongoing scholarly discussions are not captured.

The second study is limited in its research design, which did not allow for an extensive exploration of covariates, as participants saw the warning message before completing the survey. A pre-post design could further assess attitude shifts over time. Second, while gender was recorded, the study did not account for sexual orientation, gender constructs, or intersectionality, which may influence attitudes toward wildlife interactions. Third, the study measured attitudes but not actual behavior change—future research should examine real-world tourist decisions. Lastly, limitations of the SC-IAT method should be acknowledged, as contextual factors may influence implicit attitude measurements.

The third study is restricted in its focus on a single crisis case (#BoycottMurree), which limits the generalizability of findings to other tourism crises. Future research should analyze similar boycott movements across different cultural and political contexts. Second, the study relies on social media data from Twitter (X), which may not fully represent the broader public sentiment, as engagement levels and demographics vary across platforms. Expanding the analysis to other social media and news sources could provide a more comprehensive picture. Third, traditional sentiment analysis and topic modeling—while valuable tools—have inherent limitations in detecting sarcasm, context nuances, and implicit meanings in text data. Future research could integrate qualitative methods, such as interviews or discourse analysis, to validate the findings.

Study 4 has several limitations. First, it focuses on only two emotions - betrayal and anger - for practical reasons while other relevant emotions (e.g., frustration, empathy) were not examined. Future research could explore a broader range of emotional responses. Second, the study employs a cross-sectional design, which limits insights into how emotions and behaviors evolve

over time. A longitudinal approach could provide a deeper understanding of changes in tourist reactions. Third, the use of purposive sampling - while appropriate for targeting relevant participants - limits generalizability. Probability sampling could enhance the representativeness of future studies. Additionally, some regression coefficients were small, suggesting that psychological and behavioral outcomes might be better understood by integrating personality traits as moderators. Finally, while the study examined boycott and revenge intentions, it did not assess whether these intentions translate into actual behavior. Future research should incorporate experimental or real-world observations to establish a clearer link between attitudes and actions.

The fifth study is restricted by its focus on urban transport resistance in the UK, specifically in four cities (Oxford, London, Birmingham, and Bradford), which may limit the generalizability of the findings to other contexts with different political, social, and transport infrastructures. Second, the study relies on a convenience sample of social media threads, meaning the dataset might not fully capture offline public opinion or perspectives from diverse stakeholder groups. Third, while critical discourse analysis is valuable for understanding narratives, it does not measure behavioral outcomes, making it difficult to determine how online discourse translates into real-world policy support or opposition.

The sixth study is limited to a specific geographic area (the Canary Islands) and climate conditions, which may not generalize to other destinations with different seasonal patterns. Future research should explore diverse settings, including regions with single-peak, two-peak, or multiple-peak tourism seasons. Second, the study examines only six accommodation features, selected based on prior literature. Expanding the analysis to additional features and integrating other data sources (e.g., website traffic or weather conditions) could enhance predictive accuracy. Third, keyword occurrences were analyzed neutrally, meaning that consumer sentiment toward specific features was not assessed. Future studies could incorporate sentiment analysis to better understand how feature preferences influence satisfaction. Finally, while time series analysis offers valuable insights into temporal trends, more advanced forecasting methods, using Artificial Intelligence, could further refine predictions for accommodation demand.

Finally, study 7 was conducted during the Covid-19 pandemic, meaning its findings are shaped by the knowledge and perspectives available in 2022. Future research should examine post-pandemic developments to assess long-term shifts in tourism resilience. Second, the study focuses primarily on policy responses and governance failures but does not systematically

analyze traveler behavior during and after the crisis. Third, the research relies on existing literature and policy analysis, rather than primary data collection, which limits direct insights from industry stakeholders and travelers. Future studies should incorporate interviews, surveys, or case studies to enrich the findings. Finally, while the study applies a governance perspective, integrating other theoretical frameworks, such as resilience theory or systems thinking, could provide a more comprehensive understanding of crisis adaptation in tourism.

Broader methodological constraints

Sampling and generalizability. In sum, several studies rely on case-specific, geographically constrained samples, which limits the external validity of their findings. These settings provide valuable contextual insights but restrict broader generalization to global tourism markets. Future research could benefit from multi-site studies across diverse cultural and economic settings to enhance representativeness.

Cross-sectional vs. longitudinal designs. Many of the included studies adopt cross-sectional research designs, which, while suitable for capturing a snapshot of attitudes and behaviors, do not account for temporal shifts. For instance, studies on consumer behavior and crisis responses would have benefited from longitudinal tracking to observe evolving sentiments and behavioral adaptations over time. Implementing panel studies or repeated measures designs could provide more robust insights into long-term trends and structural shifts in tourism dynamics.

Data limitations. Several studies face inherent limitations in data availability and coverage. The bibliometric analysis in P1, for instance, focuses on English-language publications, potentially excluding relevant non-English contributions. Similarly, P3 and P4 rely on social media sentiment analysis, which is susceptible to algorithmic biases and demographic skewness in online engagement. Future research should incorporate multilingual datasets and alternative sources, such as expert interviews or observational studies, to mitigate these biases and enrich the robustness of findings.

This methodological reflection underscores the strengths and limitations inherent in the research approaches employed throughout this dissertation. While the mixed-methods approach has provided comprehensive insights, future research should aim for greater methodological diversity, including longitudinal designs, multilingual and multi-regional datasets, and broader theoretical integrations. Addressing these gaps will enhance the robustness of future inquiries into sustainability and crisis resilience in tourism and transport, ultimately contributing to more adaptive and ethically sound tourism governance structures.

Theoretical and conceptual considerations

Framework scope and integration. While this dissertation employs ANT as an overarching analytical framework, to properly perform an ANT analysis, more in-depth steps would be necessary (see e.g., Deason et al., 2022; Williams, 2020). Some studies (e.g., P7) acknowledge the potential value of integrating additional governance perspectives, particularly in multi-crisis contexts. Expanding theoretical models to encompass interdependencies between crises - such as climate change, economic downturns, and pandemics - could provide a more holistic understanding of resilience and sustainability in tourism.

Anthropocentric limitations. The research on animal welfare in tourism (P1, P2) highlights the persistent anthropocentric framing of justice in tourism studies. While these studies address ethical considerations, they stop short of fully integrating systemic post-humanist or multi-species perspectives. Future research should engage more deeply with non-human agency and ecological justice frameworks to advance the discourse beyond human-centered ethics.

Concluding remarks

Tourism can simultaneously act as a contributor to, a victim of, and a recovery tool for crises. This paradox has been widely observed during the Covid-19 pandemic: while the industry facilitated the global spread of the virus, particularly through aviation (Hopkins, 2021; Iaquinto, 2020), it was also among the most severely affected (Plzáková & Smeral, 2022; Scarlett, 2021), and subsequently positioned as a driver of economic recovery (Ertaş et al., 2021; Sheller, 2021). The relationship between crises and tourism therefore may take multiple forms (Hopkins, 2021).

This dissertation argues that crises represent more than temporary interruptions; they serve as critical junctures for structural transformation within tourism networks. While the pandemic created conditions for a potential reconfiguration of industry practices, the empirical studies (e.g., P5, P7) indicate that many actors may have reverted to conventional models, limiting transformative potential. These findings challenge dominant narratives of resilience and recovery, suggesting that tourism systems remain predominantly reactive and resistant to fundamental change.

The dissertation contributes to theoretical debates on Actor-Network Theory, sustainability, and post-anthropocentric perspectives by conceptualizing crises as moments of relational instability and power renegotiation. It underscores the importance of recognizing both human and non-human agents as integral to tourism governance. For future research, this calls for expanded justice frameworks that encompass animal and climate justice, as well as longitudinal analyses

to assess whether post-crisis adaptations lead to enduring transformation or short-term adjustments.

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Selbstdeklaration bei kumulativen Promotionen

Konzeption / Planung: Formulierung des grundlegenden wissenschaftlichen Problems, basierend auf bisher unbeantworteten theoretischen Fragestellungen inklusive der Zusammenfassung der generellen Fragen, die anhand von Analysen oder Experimenten/Untersuchungen beantwortbar sind. Planung der Experimente/ Analysen und Formulierung der methodischen Vorgehensweise, inklusive Wahl der Methode und unabhängige methodologische Entwicklung.

Durchführung: Grad der Einbindung in die konkreten Untersuchungen bzw. Analysen.

Manuskripterstellung: Präsentation, Interpretation und Diskussion der erzielten Ergebnisse in Form eines wissenschaftlichen Artikels.

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Eidesstattliche Versicherung

Ich, Nadja Schweiggart, versichere [1] an Eides statt, dass ich die Dissertation mit dem Titel „Navigating A Crisis-Prone World: Essays on Sustainability Issues in the Tourism and Transport Network“ selbst und bei einer Zusammenarbeit mit anderen Wissenschaftlerinnen oder Wissenschaftlern gemäß den beigefügten Darlegungen nach § 6 Abs. 3 der Promotionsordnung der Fakultät Wirtschafts- und Sozialwissenschaften vom 18.01.2017 verfasst habe. [2] Andere als die angegebenen Hilfsmittel habe ich nicht benutzt. [3]

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Anhang A: Zusammenfassung / Summary

Summary

This cumulative dissertation explores the challenges posed by sustainability crises in the tourism and transport industries. Seven individual studies examine how tourism and transport actors are affected by and adapt to recent crises, including the Covid-19 pandemic, climate change, and immoral service failures. Both quantitative and qualitative research methods are employed. In the larger context, sustainability is analyzed through the Triple Bottom Line framework, encompassing economic, environmental, and social dimensions, with each study addressing one or multiple aspects of sustainability.

Two first two articles focus on the role of animal welfare in tourism and the larger context of the biodiversity crisis. The first study analyzes the overlooked role of animal welfare in tourism research, demonstrating that tourism contributes to species extinction and biodiversity loss, while industry and academia frequently neglect the ethical implications of using animals in attractions. Through bibliometric analysis, the study identifies four key research streams and underscores the need for integrated approaches to animal welfare in tourism. The second study extends this focus by examining tourists' attitudes towards close animal interactions through experimental research, revealing that warning messages about animal welfare violations can effectively discourage visits to harmful attractions.

The third and fourth studies investigate consumer responses to immoral service failures using the #BoycottMurree case, in which economic greed amid extreme weather conditions in a Pakistani tourism destination led to the tragic deaths of 23 tourists, including 10 children. The findings illustrate how immoral crisis management—prioritizing profit over human life—provokes severe public backlash, with social media amplifying outrage and calls for boycotts. From a managerial perspective, the studies highlight the importance of reputation management in crisis contexts and suggest that strong tourist-destination relationships can mitigate negative effects.

The fifth study focuses on the urban transport sector, revealing how populist narratives obstruct sustainable mobility initiatives by framing them as elitist or undemocratic. The study underscores the need for inclusive communication strategies to align public perception with policy goals, ensuring broader acceptance of sustainable transport reforms.

The sixth study examines consumer accommodation preferences during the Covid-19 pandemic, showing that crises can temporarily shift consumer priorities toward safety, hygiene,

and isolated locations. However, using time-series analysis, the study finds that these shifts are short-lived, with no substantial long-term changes in traveler behavior beyond the pandemic. Notably, the sixth study also proves that single accommodation features have distinct seasonality.

The final study assesses the impact of Covid-19 on global tourism, drawing lessons for climate crisis management. It argues that reactive crisis responses shown during the pandemic are insufficient and calls for proactive, systemic changes to enhance tourism resilience. The study emphasizes that post-pandemic recovery efforts must integrate sustainability and equity, positioning the pandemic as a pivotal moment for long-term transformation in tourism governance.

These individual studies are synthesized within the broader research framework outlined in Chapter 0, with a concluding synopsis in Chapter 8. The dissertation addresses three overarching research questions by: 1) Identifying key actors and their interconnections in times of crisis, 2) analyzing how they are affected by these crises, and 3) exploring how they respond or adapt to these challenges. Guided by Actor-Network Theory (ANT) as its primary analytical lens in the synoptical discussion, the dissertation ultimately examines how both human and non-human actors in the tourism and transport industries navigate crises. By analyzing how actor relationships shift and adapt under external pressures, it contributes to a deeper understanding of sustainability challenges in an era of increasing environmental and social uncertainty. The dissertation concludes with recommendations for future research, advocating for more interdisciplinary approaches to address the ethical, environmental, and social dimensions of tourism sustainability.

Zusammenfassung

Die vorliegende kumulative Dissertation untersucht die Herausforderungen verschiedener Nachhaltigkeitskrisen auf die Tourismus- und Transportbranche. In sieben individuellen Einzelstudien wird analysiert, wie Akteure des Tourismus- und Transportsektors von aktuellen Krisen – einschließlich der Covid-19-Pandemie, des Klimawandels und unmoralischer Dienstleistungsfehler – betroffen sind und auf diese reagieren. Die einzelnen Studien nutzen dabei quantitative oder qualitative Forschungsmethoden zum Erkenntnisgewinn. Nachhaltigkeit wird dabei im übergeordneten Kontext anhand des Triple Bottom Line-Frameworks betrachtet, der die wirtschaftlichen, ökologischen und sozialen Dimensionen umfasst; jede der Studien fokussiert entweder eine oder mehrere Nachhaltigkeitsdimensionen.

Die ersten beiden Artikel heben die Bedeutung von Tierwohl im Tourismus hervor und betrachten diese im Kontext der Biodiversitätskrise. Die erste Studie analysiert die oftmals übersehene Rolle des Tierschutzes in der Tourismusforschung. Sie zeigt, dass der Tourismus zum Artensterben und zum Verlust der Biodiversität beiträgt, während sowohl die Forschung als auch die Tourismusbranche die moralischen Implikationen des Einsatzes von Tieren in touristischen Attraktionen häufig vernachlässigen. Durch eine bibliometrische Analyse identifiziert die Studie vier zentrale Forschungsstränge und betont die Notwendigkeit integrierter Ansätze zur Berücksichtigung des Tierschutzes im Tourismus. Die zweite Studie vertieft dieses Thema, indem sie mithilfe experimenteller Forschung die Einstellungen von Tourist:innen hinsichtlich kommerzieller, physischer Mensch-Tier-Interaktionen untersucht. Die Ergebnisse zeigen, dass Warnhinweise mit Hinweisen auf negative Externalitäten auf das Tierwohl durch solche Interaktionen wirksam dazu beitragen können, Tourist:innen von Besuchen in schädlichen Tierattraktionen abzuhalten.

Die dritte und vierte Studie untersuchen die Reaktionen von Reisenden auf unmoralische Dienstleistungsfehler anhand der #BoycottMurree-Kampagne. In diesem realen Fallbeispiel aus dem Jahr 2022 führte wirtschaftliche Gier während extremer Wetterbedingungen in der pakistanischen Tourismusdestination Murree zum tragischen Tod von 23 Tourist:innen, darunter 10 Kinder, denen Obdach aufgrund finanzieller Interessen verwehrt wurde. Die Ergebnisse verdeutlichen, dass unmoralisches Krisenmanagement, das wirtschaftliche Interessen über Menschenleben stellt, zu erheblichem öffentlichem Widerstand führt, wobei soziale Medien Empörung verstärken, und Boykottaufrufe verbreiten. Aus Managementperspektive zeigen die Studien, dass Reputationsmanagement in Krisensituationen

entscheidend ist und dass starke Beziehungen zwischen Tourist:innen und Destination negative Effekte abmildern können.

Die fünfte Studie widmet sich der Nachhaltigkeit im urbanen Transportsektor und zeigt, wie populistische Narrative nachhaltige Mobilitätsinitiativen behindern, indem nachhaltige Verkehrspolitik als elitär oder undemokratisch dargestellt wird. Die Studie unterstreicht die Notwendigkeit inklusiver Kommunikationsstrategien, um die öffentliche Wahrnehmung mit politischen Zielen in Einklang zu bringen und eine breitere Akzeptanz nachhaltiger Verkehrspolitik zu fördern.

Die sechste Studie untersucht die Unterkunftspräferenzen von Reisenden während der Covid-19-Pandemie und zeigt, dass die Krise die Konsumprioritäten vorübergehend auf Sicherheit, Hygiene und isolierte Unterkünfte verlagert hat. Mithilfe einer Zeitreihenanalyse stellt die Studie jedoch fest, dass diese Veränderungen nur kurzfristiger Natur sind und sich langfristig keine nachhaltigen Veränderungen in den Unterkunftspräferenzen aufgrund der Pandemie abzeichnen. Zentral in dieser Studie ist ebenso, dass es erstmals gelang, empirisch aufzuzeigen, dass einzelne Unterkunftsmerkmale individuelle Saisonalitäten aufweisen.

Die letzte Studie bewertet die Auswirkungen von Covid-19 auf den globalen Tourismus und zieht daraus Lehren für das Management der Klimakrise. Sie argumentiert, dass die während der Pandemie gezeigten reaktiven Krisenreaktionen unzureichend sind, und fordert proaktive, systemische Veränderungen zur Stärkung der Krisenresilienz im Tourismus. Die Studie hebt hervor, dass die Erholung des Tourismussektors nach der Pandemie Nachhaltigkeit und soziale Gerechtigkeit integrieren muss, wenn die Krise als Wendepunkt für eine langfristige Transformation im Tourismusmanagement genutzt werden soll.

Diese Einzelstudien werden in einem übergeordneten Forschungsrahmen (Kapitel 0) synthetisiert und mit einer abschließenden Synopse in Kapitel 8 betrachtet. Diese adressieren drei zentrale Forschungsfragen, die auf Basis der vorliegenden Einzelstudien beantwortet werden: 1) Identifizierung der zentralen Akteure und ihrer Interaktionen in Krisenzeiten, 2) Analyse der Auswirkungen der Krisen auf diese Akteure, und 3) Untersuchung der Reaktionen und Anpassungsstrategien dieser Akteure. Als übergeordnete analytische Perspektive dient die Akteur-Netzwerk-Theory (Actor-Network Theory, ANT), die es ermöglicht, sowohl menschliche als auch nicht-menschliche Akteure der Tourismus- und Transportbranche im Krisenkontext zu untersuchen. Durch die Analyse der dynamischen Veränderungen in den Beziehungen zwischen Akteuren trägt die Dissertation zu einem tieferen Verständnis der Herausforderungen der Nachhaltigkeit in einer Zeit zunehmender ökologischer und sozialer

Unsicherheiten bei. Abschließend gibt die Dissertation Empfehlungen für zukünftige Forschung und plädiert für interdisziplinäre Ansätze, um die ethischen, ökologischen und sozialen Herausforderungen der Tourismusbranche ganzheitlich zu adressieren.

Anhang B: Management summary of studies

Study 1: Mapping the role of animal welfare in tourism

The article "Mapping the role of animal welfare in tourism" focuses on the intersection of animal welfare and tourism research using a bibliometric co-occurrence analysis of 405 publications from 1994 to 2023. The study ultimately seeks to address the limited attention paid to animal welfare in tourism studies despite the increasing use of animals in the industry and despite ample evidence of negative welfare effects existing in other research disciplines. Summarizing the existing research articles on animal welfare and tourism through co-occurrence analysis of article keywords, it highlights how animals, used in zoos, aquariums, wildlife experiences, and as working animals, often suffer physically and psychologically from their involvement in tourism.

Key findings from the analysis reveal that research on this topic spans various disciplines such as social, veterinary, and environmental sciences, but the tourism field itself has only recently increased its focus on the subject, with a notable rise in publications since 2020, which coincides with the beginning of the Covid-19 pandemic, potentially hinting towards heightened attention for biodiversity issues with the start of the pandemic. Four primary research streams with regards to studies investigating the dimensions of animal welfare and tourism were identified: (1) *wildlife conservation*, (2) *anthropogenic impacts on animal behavior*, (3) *visitor perspectives on human-animal interactions*, and (4) the *welfare of working animals*.

Synoptically, the paper calls for a more integrated approach between tourism research and animal welfare considerations to better address the moral implications of using animals for tourism purposes. It also emphasizes the need for further interdisciplinary research, as well as practical applications, such as creating sustainable tourism models that minimize harm to animals and biodiversity. The study serves as a foundation for future inquiries into tourism's impact on animals and stresses the importance of ongoing ethical discussions in the field.

Study 2: Tourists' attitudes towards animal activities

Following the call-to-action in Study 1, this research explores tourists' implicit and explicit attitudes toward close wildlife interactions. While animal-based tourism generates significant economic benefits, it often imposes severe welfare challenges on captive wildlife, leading to physical and psychological harm. Traditional research into tourists' attitudes toward these activities has primarily relied on explicit self-reporting, which is prone to social desirability bias. To address this limitation, the study incorporates the Single-Category Implicit Association Test (SC-IAT) to measure underlying implicit attitudes, alongside explicit questionnaire-based methods.

The study investigates whether exposure to a negatively framed warning message about animal welfare impacts can influence tourists' attitudes. Data was collected from 1,219 respondents in Germany and the UK, divided into two groups—only one of them presented with the warning message. The findings reveal that participants without the warning message exhibit largely neutral implicit attitudes toward close wildlife interactions, while explicit attitudes tend to be slightly negative. The intervention significantly decreases both implicit and explicit attitudes, with stronger effects observed among women. Interestingly, implicit attitudes, often considered stable, were also notably affected by the priming intervention, challenging existing assumptions about their resistance to external influences.

The study further identifies a moderate negative correlation between general attitudes toward animal welfare, as measured by the Animal Attitude Scale (AAS), and attitudes toward wildlife interactions. Women and respondents with higher AAS scores are more likely to hold negative attitudes and are more susceptible to the warning message, highlighting gender and moral awareness as key variables.

These findings have practical implications for conservation organizations, policymakers, and destination managers. Implementing warning messages or labels highlighting animal welfare concerns could effectively discourage participation in harmful wildlife attractions. Theoretically, the research underscores the value of combining implicit and explicit measures to comprehensively understand tourists' attitudes and decision-making processes. Future studies could explore behavioral outcomes and refine methodologies to better capture the complex interplay between ethics, emotions, and tourism choices.

Study 3: #BoycottMurree campaign on Twitter

Study 3 and 4 examine an especially condemnable incident that took place in a popular Pakistani tourist destination in 2022 whereby the moral failure, greed, and negligence of tourism service providers in response to a severe weather incident caused the death of 23 individuals following a snowstorm in Murree, Pakistan. On this background, the first of two studies investigates public responses to such immoral service failures that occur during crises, focusing on how these events are discussed and perceived on social media.

Utilizing a dataset of 89,897 tweets related to the “Murree crisis”, the researchers employed text mining techniques including topic modeling and sentiment analysis. The aim was to uncover the themes, sentiments, and dynamics of public discussions across different stages of the crisis as defined by Fink’s four-stage model: prodromal, acute, chronic, and termination stage.

Findings reveal that the volume of tweets significantly increased during the chronic phase, with the majority of public sentiment being negative. Notable themes prominent in the conversations included criticisms of local service providers, expressions of anger, fear, and sadness, and calls for boycotts against Murree as a tourism destination. The data indicated that emotional engagement changed over the crisis life cycle, with anger being the dominant emotion in the acute phase, followed by sadness as the situation progressed.

Additionally, the study presents practical implications for tourism management, emphasizing the need for proactive crisis management strategies. Destination managers and service providers are encouraged to monitor social media discussions actively and engage with the community to mitigate negative perceptions. Aside from recommended proactive crisis avoidance and a shift towards sustainability-centric management practices, immediate management responses to such crises should involve transparent communication, acknowledgment of faults, and clear actions to restore trust.

The research contributes valuable insights into the dynamics of social media interactions in crisis contexts, demonstrating how public sentiment can influence destination reputation and provide critical data for crisis management strategies. It highlights the importance of understanding internal crises—events caused by service failures—as distinct from external crises, emphasizing that the tourism industry must adapt to the changing landscape of public perceptions shaped by digital discourse.

Study 4: Tourists' responses to tourism service failures

Building upon the insights from Study 3 and the case example of #BoycottMurree, this study explores how unethical service failures in the tourism sector affect former visitors' emotional and behavioral responses, particularly through social media. Utilizing sense-making theory, the research examines how these negative experiences lead to psychological reactions such as perceived betrayal and anger, and further result in actions like the desire to boycott the destination, seeking revenge, complaining, or showing forbearance in tourists who had visited the destination before the tragic incident. The research highlights the moderating role of the strength of tourist-destination relationships in mitigating these negative impacts.

The study employs structural equation modeling (SEM) to analyze data collected from 307 tourists who shared their experiences of service failures with the destination Murree on social media. The findings indicate that negative destination experiences significantly contribute to feelings of betrayal and anger among tourists who had previously visited the destination. These emotions subsequently amplify behavioral responses, including greater intentions to boycott the destination, a heightened desire for revenge, and reduced willingness to tolerate the situation. The results establish that perceived betrayal and emotions of anger mediate the relationship between the negative online experience and intentions toward boycott and revenge, while strong emotional bonds with the destination reduce feelings of betrayal and anger.

The implications of this research are relevant for tourism crisis management strategies. Above and beyond condemning and avoiding such greedy practices altogether, findings suggest that destination marketers and managers should be aware of how service failures can trigger strong negative emotions and subsequent retaliatory behaviors. By fostering strong relationships with tourists, destinations may alleviate negative sentiments and promote forbearance for unmanageable crises, thus enhancing resilience against the reputational damage caused by service failures.

Study 5: Urban transport systems change

On the background of the climate crisis, this fifth article, titled "Urban Transport System Changes in the UK: In Danger of Populism?", taps into another form of active resistance and analyzes the resistance faced by urban transport reforms aimed at reducing pollution and promoting sustainable travel in cities. London, Oxford, Birmingham, and Bradford are used as case examples to examine pro-environmental policy initiatives like Ultra-Low Emission Zones (ULEZ), Clean Air Zones (CAZ), and Low Traffic Neighborhoods (LTN), highlighting the significant opposition they encounter, particularly from populist movements.

Utilizing critical discourse analysis, the researchers explored 185 social media threads to uncover the nature of this opposition. The findings indicate that populist discourse plays a central role in resisting these transport policies. Opponents often characterize these reforms as elite-driven, claiming they unfairly target 'ordinary' citizens, especially within low-income demographics. This rhetoric frames the reforms as threats to personal freedom, local economy, family life, and the rights of vehicle owners, which creates a narrative of victimization. Key discursive strategies employed by opponents include the dismissal of scientific evidence supporting the need for such reforms and the effectiveness of such policies, asserting without credible backing that they worsen congestion or disproportionately affect the lower-income population. Another common strategy features a reversal of causality, positing cyclists and pedestrians as the true 'culprits' behind congestion and accidents instead of motorized vehicles. Populist rhetoric emphasizes perceived injustices, portraying additional costs from ULEZ charges as government exploitation of working-class individuals. Emotional appeals are prevalent within these discourses, with opponents presenting themselves as defenders of family values, vulnerable communities, and small businesses. They argue that pro-environmental transport reforms isolate communities and undermine social cohesion, invoking fears surrounding the loss of democratic rights. The study also identifies a hierarchy of opposition that moves from fact-based arguments to emotional reactions, sometimes escalating to instances of vandalism, such as the defacement of ULEZ cameras, which are glorified online. The rhetoric often casts policymakers in a negative light, labeling them as corrupt, undemocratic, or authoritarian and employing shame-labeling techniques to delegitimize advocates of the reforms.

The analysis reveals how intertwined populist narratives are with the opposition against "green" urban transport policies, highlighting significant societal polarization. Consequently, populist

movements capitalize on the division between ‘the people’ and ‘the elite’, using urban transport reforms as a battleground for these tensions.

To diminish resistance, it is suggested that policymakers engage with and refute these discursive strategies, developing more inclusive communication and policy designs. Additionally, implementing targeted policies, such as subsidies for vulnerable groups and flexible pricing schemes, may alleviate some financial concerns and the general fear of “being left behind” raised by opponents.

Study 6: Dynamics in accommodation feature preference

Taking a managerial perspective, the study titled "Dynamics in Accommodation Feature Preferences: Exploring the Use of Time Series Analysis of Online Reviews for Decomposing Temporal Effects" aimed to analyze changes in travelers' preferences for accommodation features during the COVID-19 pandemic by employing time series analysis to disentangle seasonal, trend, and disruption effects. Utilizing a substantial dataset derived from 519,200 online traveler reviews from the Canary Islands that spans seven years (2015-2022), the research dissects the significance of six selected accommodation features: view, terrace, pool, shop, location, and room.

The findings indicate that individual accommodation features exhibit distinct seasonal patterns, representing a novel concept and empirical validation. Trend analysis reveals continual relevance shifts in these features, with the most significant impacts observed during the pandemic. Notably, while short-term disruptions due to COVID-19 are recognized, the lack of long-term effects suggests that traveler preferences are more resilient than anticipated.

Practically, the study highlights the importance of addressing seasonality at the accommodation feature level. Accommodation providers can benefit from understanding seasonal trends and optimizing pricing strategies based on the temporal relevance of features. Real-time insights drawn from this analysis can aid in tailoring marketing efforts, thus improving occupancy rates and customer satisfaction. It also illustrates that considerations for accommodation must go beyond conventional seasonal models, revealing the layers of complexity that exist at the individual feature level. Theoretically, this research contributes to the literature by applying a novel time series perspective on travelers' accommodation preferences, demonstrating how these patterns can be influenced by external factors shock, such as the pandemic, while also showcasing the utility of online traveler reviews as a mechanism for tracking changes in customer sentiment and preferences. In conclusion, the study delineates that while the COVID-19 pandemic had significant short-term impacts on accommodation feature preferences, the overall trends indicate a return to prior preferences, reaffirming that traveler behavior remains dynamic yet predictable to an extent.

Study 7: Two years of Covid-19 and tourism

The last of seven papers discusses the ongoing (2022) impacts of the COVID-19 pandemic on the global tourism industry and draws parallels to climate change, suggesting that lessons learned during the pandemic can inform future strategies for mitigating global warming.

Since COVID-19's onset in January 2020, the tourism sector has faced ongoing instability due to infections, vaccine challenges, and travel restrictions. Despite calls to "build back better," evidence of significant transformation remains limited. The paper argues that the pandemic should be viewed as an analogy for climate change, as both crises reflect vulnerabilities in global systems and highlight the necessity of proactive management. The authors emphasize that immediate responses to the pandemic often exhibited panic behavior rather than strategic planning, paralleling how many governments have approached climate change. The German government's handling of the pandemic serves as a case study, revealing the limitations and temporary nature of actions taken in response to an unfolding crisis.

Key lessons from the pandemic include the need for anticipatory crisis management rather than reactive measures, as well as the acknowledgment of citizens' rights during emergencies. Looking to the future, the paper underscores the importance of recognizing the interconnectedness of various global challenges, including the mental health implications of crises and their effects on social cohesion. The authors caution that as countries grappled with the fallout from the pandemic, the urgency of addressing climate change may wane, resulting in opportunities for meaningful change being overlooked. They advocate for systemic transformations within the tourism network that prioritize sustainability and equitable practices, moving beyond merely resurrecting pre-pandemic models.

In conclusion, for tourism stakeholders, the path forward must involve comprehensive changes that align economic recovery with environmental sustainability. The experiences gained during the pandemic should serve as a catalyst for reshaping tourism, ensuring that it becomes more resilient and fairer, thereby solidifying its viability for future generations in a world increasingly influenced by the realities of climate change. Addressing these challenges will require collaboration, innovation, and a long-term vision for tourism that integrates ecological stewardship alongside economic goals.