

PAST, PRESENT AND FUTURE OF THE RESEARCH ON THE PRO-ENVIRONMENTAL BEHAVIOUR IN TOURISM: A BIBLIOMETRIC ANALYSIS

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Received: November 22, 2018
Accepted: May 9, 2019

ABSTRACT: *Environmental sustainability is one of the key challenges humanity is facing today. Tourism is an invasive industry in terms of the damage it causes to the environment. An effective way to mitigate the negative environmental impacts of tourism is to shift tourist behaviour towards environmentally friendly behaviour. While there is a growing number of publications on tourist pro-environmental behaviour (PEB), this paper aims to overview the existing research in this area by applying a bibliometric analysis. Co-citations, keyword co-occurrences and bibliographic coupling are used to analyse the tourism PEB research and provide guidelines for the future.*

Key words: *pro-environmental behaviour, tourism, environment, bibliometric analysis, review.*

JEL classification: Z32

DOI: 10.15458/ebr102

1 INTRODUCTION

Environmental sustainability represents one of the key challenges humanity is faced with today. In addition to the recent cases with global media coverage on the issue, such as the exponential growth of the amount of plastic in the ocean – the Great Pacific Garbage Patch (Lebreton et al., 2018), or reaching the point of no return for the glaciers melting (Marzeion et al., 2018), there is ample evidence about environmental degradation resulting from human activities. The consequences of such environmental degradation have had and will continue to have a direct impact on the quality of human life.

Major emissions on a global scale are related to the sectors of energy supply, agriculture and industry, however, the precise contribution of tourism to global pollution is more complicated to estimate. This is because tourism is assembled from different sub-sectors (Peeters & Dubois, 2010), and is at the same time recognized as the runner-up in terms of contributing to the global climate change (Gössling, 2013). More recent studies indicate

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that tourism contributes around 8% of greenhouse gas emissions, which are expected to rise to 12% until 2025 (Lenzen et al., 2018).

The consumer lifestyle, behaviour and spending practices are critically important for sustainable transformations (IPCC, 2014), where individuals play a central role in the process of climate change mitigation (Gössling & Peeters, 2007; O'Brien, 2015). In the last 10 years, there has been a continuous growth in research on the pro-environmental behaviour in tourism. The pro-environmental behaviour (PEB) is the "behavior that consciously seeks to minimize the negative impact of one's actions on the natural and built world" (Kollmuss & Agyeman, 2002, p. 240). The PEB research uses different levels of pro-environmental concepts, from pro-environmental beliefs to knowledge, attitude, intention, and also past, current, intended or actual behaviour (Diamantopoulos et al., 2003).

The purpose of this paper is to identify the main topics of the ongoing discourse researching the PEB phenomenon. A bibliometric analysis is applied, allowing us to summarise a large amount of data and reflect on the existing and actual streams within the relevant literature.

The objectives of the paper are: 1) to identify the theoretical bases upon which the tourism PEB research is built; 2) to define the main sub-topics within the tourism PEB research and their change over time; 3) to determine the frontiers and current trends in the tourism PEB research; 4) to explore the directions for future research by reviewing the identified elements, relationships and gaps in the existing literature.

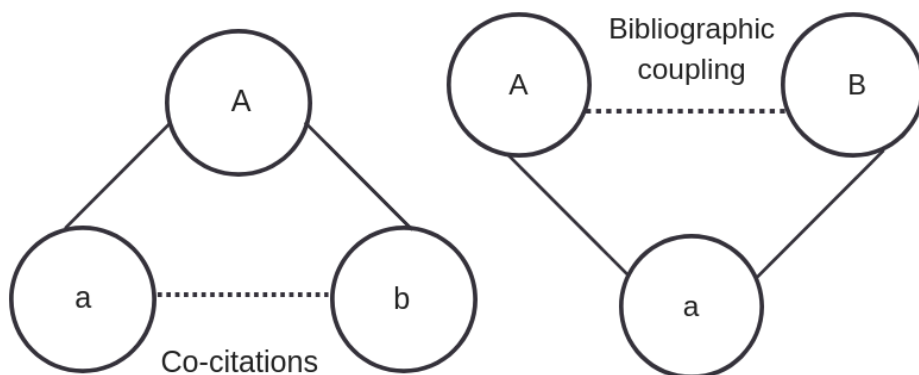
2. METHOD

A bibliometric analysis enables a quantitative approach to the literature overview. We use the bibliometric networks visualisation, or science mapping (Eck & Waltman, 2014), in order to explore the topic of PEB in tourism. This method provides an overview of the area by using a large number of sources. It compares the similarities in the references cited in the documents, or keywords extracted from a title, keyword list and abstract, and thus identifies the relationships between the documents. There are two types of documents, namely the primary ones (A, B; Figure 1), acquired by searching the database, and the secondary ones (a, b; Figure 1), cited in the reference list of the primary documents. The bibliometric network consists of nodes, i.e. publications or keywords in our analysis, and edges, i.e. links and relations between the nodes (Eck & Waltman, 2014). The distance between the nodes reflects the relatedness between them, while the size of the nodes points to the link strength. Further, link strength indicates either the number of cited references that the two publications share in the bibliographic coupling, the number of publications that cite the two documents together in the co-citations, or the number of publications in which two terms occur together in the keyword co-occurrence analysis.

So far this method has been underused in sustainable tourism research. We found few studies in the area that apply bibliometrics to reviewing the existing literature. Lu and Nepal (2009) analysed publications from the *Journal of Sustainable Tourism* in a 15-year period (1993–2007). Ruhanen, Weiler, Moyle and McLennan (2015) provided a bibliometric analysis of their 25-year sustainable tourism research published in the four highest-ranking journals in the field.

In this paper, we apply three types of the bibliometric analysis, namely co-citation, bibliographic coupling, and keyword analysis. In the next step, we visualise the networks by using VOSviewer (VOSviewer - *Visualizing Scientific Landscapes*, 2018). These three methods are complementary and when applied together, they allow us to see the analysed area from a multi-angle perspective (Zupic & Čater, 2014). VOSviewer uses distance-based visualizations, where the distance between the nodes reflects the relatedness of the nodes. The software creates a normalized network and maps nodes in a two-dimensional space, where strongly related nodes are located nearby and the less related nodes are located further (Eck & Waltman, 2014). The documents or terms (nodes) which occur together most frequently are then grouped in clusters. The latter are assigned by VOSviewer and indicated in different colours, while each node in the network is assigned to one cluster only (Eck & Waltman, 2014).

Figure 1: Principles of the co-citation and bibliographic coupling analysis



Source: adapted from Vogel and Güttel (2013)

In co-citations, we analyse the clusters of the documents from the primary document reference list. Two documents (a and b in Figure 1) are co-cited when there is a third document (A) citing them. The result therefore shows the relationship between the secondary documents cited together and can be used to identify the theoretical basis of

the PEB research. These publications are often referred to in the primary documents. By analysing the clusters which are based on the frequency of the secondary documents being cited together, we are able to ascertain the topic that connects them. This method is a good way to identify the most influential and fundamental pieces of any research and serves as the foundation for new knowledge (Zupic & Čater, 2014). Due to the time needed for the publication process, the identified documents reflect the state of the researched field from a few years ago. In other words, the outcome changes over time, which means the same documents might or might not be cited in future research (Zupic & Čater, 2014).

The keyword analysis is used for identifying the content structure of the tourism PEB research and analysing the change in topics over time. Keywords are extracted from the title, keyword list and abstract. We apply the term co-occurrence with binary counting, which means the keywords are counted if they are present in a document, however, the frequency of the word occurrence in a particular document does not impact the outcome. The keywords occurring together most frequently are grouped in clusters. In order to see the change over time, the analysis connecting the keywords to the average year of publication during which this keyword occurs is used. This analysis helps to trace how the research focus gradually shifts over the researched time.

To analyse the trends in the current research, the bibliographic coupling analysis is applied. The bibliographic coupling principle is the opposite of the co-citations principle, namely, it defines the similarities between the primary documents (A, B) based on the shared references, i.e. secondary documents (a, b). The primary documents are mapped, which allows inclusion of the newest publications that have not yet been cited. This method is a good way to identify the most recent research. For this analysis of the tourism PEB research, a period of 5 years (2014-2018) was selected.

In the research, the Web of Science (WoS) database was used. In the WoS database, the publications on pro-environmental behaviour within the tourism context were searched for, where the search words entered were “*pro-environment* behavio*” AND “*touris*” to allow the variation in spelling. As the search results were not complete, we manually added the relevant publications from the key authors we knew of from the previous literature review, since they were missing in the machine-generated database. Some publications were missing because of the use of different terms to describe pro-environmental behaviour. Further, we checked the titles and abstracts of all documents in the database and deleted the irrelevant ones. The database, containing the main information about the document, i.e. title, year of publication, authors, source, list of references, abstract and keywords, was then processed with VOSviewer which created network maps based on the similarities found between the reference lists or keywords.

In total, 205 primary documents were used in the co-citation and keywords analysis (173 articles, 15 reviews, 7 proceedings, 6 book chapters, 3 editorials, and 1 book), and 142 documents in the bibliographic coupling analysis (120 articles, 11 reviews, 7 proceedings,

3 book chapters, and 1 book). Papers in the field of PEB in tourism are mainly published in the Journal of Sustainable Tourism (46 publications), Tourism Management (20), Annals of Tourism Research (9), Journal of Travel Research (9), Current Issues in Tourism (7) and Journal of Environmental Psychology (6).

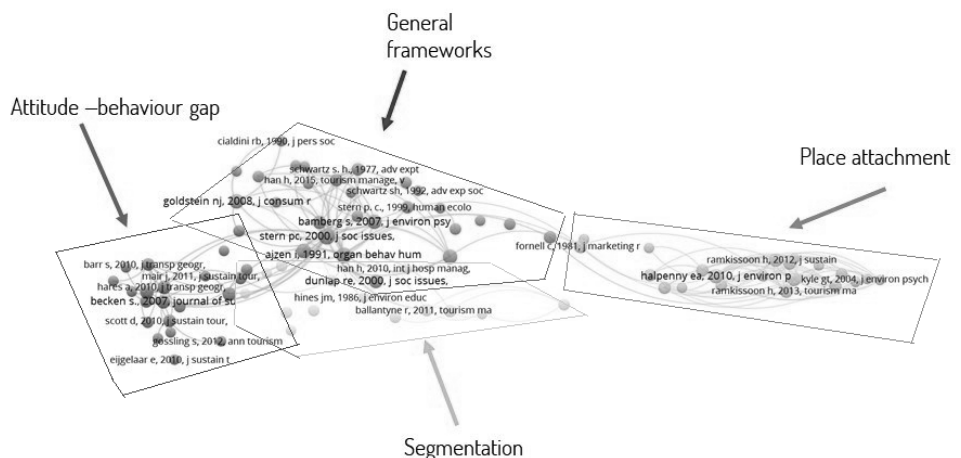
The clusters were interpreted with the help of the “human” content analysis of the documents. In other words, we read the documents and analysed them in terms of their contribution to the story of their clusters. In the continuation, we identified the main idea of each document as well as the features which the selected document shared with the other documents in the cluster. In order to do this, we created a table with a short summary on the method, theories, context and findings of the research for each document. When the common theme of the read documents was identified, the selected cluster was assigned a name.

3. RESULTS

3.1. Theoretical basis for the tourism PEB research

In the co-citation analysis, the documents cited by the articles found in the WoS database are clustered. In total, 209 primary documents, which contain 10,676 cited documents in their reference lists, were identified. Out of these 10,676 documents, 83 have ten and more citations; the results are mapped as four clusters in Figure 2.

Figure 2: Co-citation network visualization for tourism PEB



General frameworks, normative drivers of PEB. The red cluster summarizes the most frequently used theories in the PEB research, namely the theory of planned behaviour (TPB) (Ajzen, 1991), value-belief-norm theory (VBN) (Stern, 2000), norm-activation model (NAM) (Schwartz, 1977), new environmental paradigm (NEP) (Dunlap et al., 2000), and models combining certain components of these theories (Bamberg & Möser, 2007) or frameworks (Kollmuss & Agyeman, 2002; Steg & Vlek, 2009) to encourage PEB. Clustering these publications together might be a result of them being included in the literature review section of the majority of the publications as the basis of the PEB research. In addition, the papers from the cluster pay particular attention to the role of the normative drivers of PEB (De Groot & Steg, 2009; Goldstein et al., 2008; Hunecke et al., 2001).

Place attachment. The research in the green cluster is based on the place attachment by establishing the relationship between place attachment and pro-environmental behaviour. Place attachment is an attitudinal component that is closely related to the PEB intention, which leads to behaviour (Ramkissoon et al., 2012). This cluster analyses the engagement to PEB from the perspective of the sense of place (Jorgensen & Stedman, 2001; Stedman, 2002) and place attachment. The main concepts researched are the place identity, place dependence, place affect and place social bonding (Ramkissoon et al., 2012), and PEB intentions (Ramkissoon et al., 2013) or general PEB (Halpenny, 2010). Scannell and Gifford (2010) suggest distinguishing between the natural and civic place attachment due to them having a different effect on PEB. Similarly, Williams, Patterson, Roggenbuck and Watson (1992) differentiate between an attachment to the place and to the wilderness, where the latter includes more emotional and symbolic meaning.

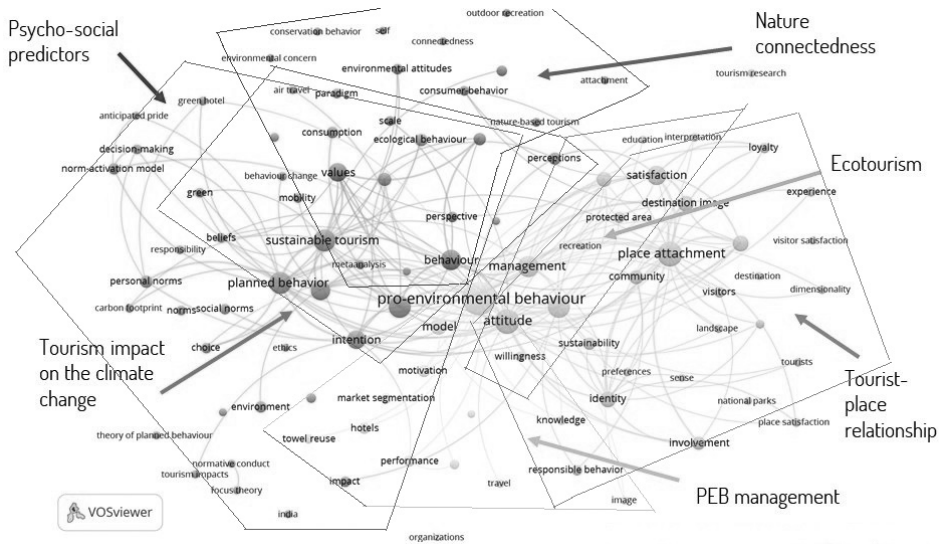
Attitude-behaviour gap. The blue cluster brings attention to the inconsistency between the expressed attitudes and actual behaviour, especially with regard to high-cost behaviours, such as transportation (Barr et al., 2010; Becken, 2007; McKercher et al., 2010). While people agree to small behavioural changes, e.g. participation in the compensation schemes, travel behaviour is unlikely to be significantly modified. Firstly, this is because travel behaviour is high-cost behaviour (Barr et al., 2010), and secondly, because people believe they have the “right to holidays” (G. Miller et al., 2010). An attitude-behaviour gap (Juvan & Dolnicar, 2014) or even an awareness-attitude gap (Hares et al., 2010) characterises PEB in tourism. Even the most highly aware individuals are unlikely to act pro-environmentally while on holidays (Barr et al., 2010; Juvan & Dolnicar, 2014; McKercher et al., 2010). Some researchers report low awareness (Hares et al., 2010), lack of practical strategies and declarative character of the goals for climate change mitigation (Scott et al., 2010), however, even those that are aware are unlikely to reduce their impact because they do not consider holidays to be associated with PEB, or justify their inaction by barriers such as the insignificance of the individual’s impact (Hares et al., 2010; Juvan & Dolnicar, 2014; G. Miller et al., 2010).

Segmentation of tourists according to their PEB. The yellow cluster focuses on the demand-side activities to encourage PEB, applying a segmentation of tourists depending on their level of PEB. Visually it is located very close to the red cluster, which we interpret as a result of paying attention to frameworks and constructs, however, testing them in different contexts. Tourists are not homogeneous in their behaviour neither in the general PEB patterns nor in the transfer of PEB from home to the tourism context (Dolnicar & Grün, 2009). For example, wildlife tourism or ecotourism often include pro-environmental actions as part of the offered experience, making such tours attract more pro-environmental tourists (Ballantyne et al., 2009, 2011). Nevertheless, even within this group, there are those who are initially more predisposed to PEB (Ballantyne et al., 2011). The approaches to segmentation differ, e.g. the use of value orientation associated with PEB (Fairweather et al., 2005), or environmental attitudes, moral obligations, travel patterns, as well as the context of PEB and personal characteristics (Dolnicar, 2010; Dolnicar & Grün, 2009; Dolnicar & Leisch, 2008). Another aspect highlighted in this cluster is the impact of environmental information and awareness. Knowledge and awareness are the basis for an intention which leads to behaviour (Hines et al., 1987). They also serve as a basis for the segmentation through which we distinguish people who are more likely to act pro-environmentally from the people who are less likely to do so.

3.2. Key topics of tourism PEB and the shift in focus over time

In order to analyse the development of the pro-environmental behaviour research in tourism, we conducted the keyword co-occurrence analysis. We used the same database of publications as for the co-citations analysis, extracting the keywords from the title, abstract and keyword list of the primary documents. This resulted in 751 keywords in total, of which 101 were mapped as a network because they occurred three and more times. The keyword co-occurrence analysis was conducted in two steps. Firstly, we analysed the keyword co-occurrences by clusters in order to see which topics are present in the discussion of tourism PEB research (Figure 3). Then we analysed the same keywords in relation to the average year of the publications in which they appeared (Figure 4).

Figure 3: Keywords co-occurrence network visualization for tourism PEB



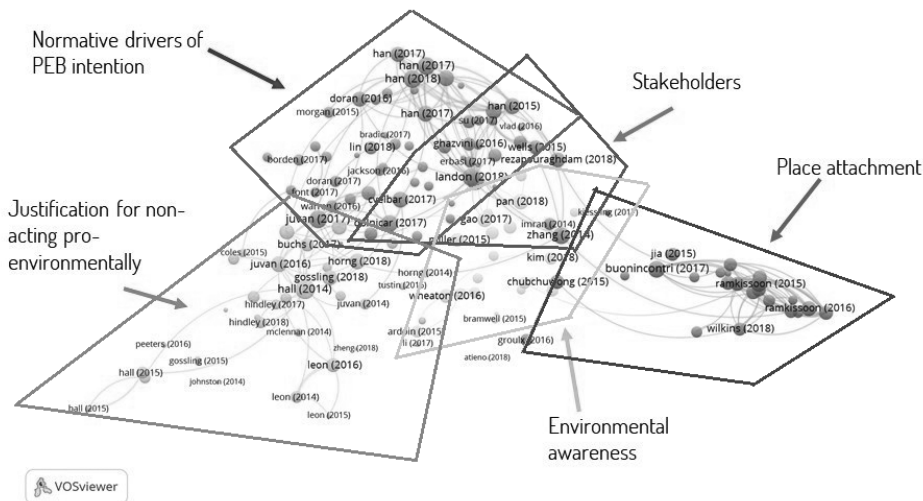
Six clusters in total were identified. The red cluster includes the *predictors of PEB*, which are theories, frameworks and constructs. The green cluster is about the *tourist-place relationship* and focuses on place identity, place attachment and a sense of place elements. The dark blue cluster can be interpreted as *nature connectedness*, including also the concepts of environmentalism and conservation. The yellow cluster focuses on the *PEB management* and revolves around market segmentation and the strategies of the PEB implementation in hotels and organizations. The purple cluster describes *tourism impact on climate change*. The keywords used to explain this field of research are climate change paradigm, mobility, and behaviour change. Finally, the turquoise cluster is about *ecotourism* and represents protected areas and environmental education through tourist activities.

Figure 4 provides an overview of the keywords to illustrate how the topics changed through time. Dark blue indicates the oldest, while red represents the newest publications. However, the year data have been omitted here.– As an average number, year is instead used to identify the sequence in which keywords were trending in the research, without connecting them to particular time periods. Colours on this graph do not represent clusters, but are rather used to demonstrate the average year of publication when the keyword occurred.

3.3. Frontiers in the PEB research

The aim of the bibliographical coupling analysis is to discover the frontiers in the PEB research in tourism. The directions for future research can be predicted from the analysis of literature gaps. For the bibliographic coupling analysis, we limit the publications to the ones published in the last 5 years (2014-2018). A total of 142 publications were mapped and analysed after a preliminary check for the relevance to the topic. A minimal number of citations was set as 0 in order to add even the most recent papers to the analysis. The analysis resulted in five clusters presented in Figure 5.

Figure 5: *Bibliographic coupling network visualization for the tourism PEB*



Normative drivers of the PEB intention. The studies using norms to predict an intention to behave pro-environmentally are within the red cluster of Figure 5. The norm-based research covers different tourist types: convention goers, youth tourists, cyclists, social media users and their relation towards PEB (H. Han, Hwang, et al., 2017; H. Han, Kim, et al., 2017; H. Han & Hwang, 2017; H. Han & Hyun, 2018; W. Han et al., 2018), except Lin, Yu and Chang (2018) who study the managers' perspective. Along with the social and personal norms, articles explore the role of the willingness to sacrifice (Doran & Larsen, 2016; Landon et al., 2018), cognitive and affective triggers (Dolnicar et al., 2017; H. Han, Hwang, et al., 2017; H. Han & Hwang, 2015; H. Han & Hyun, 2018) and habits (H. Han & Hyun, 2018). Mostly, researchers use pro-environmental intention as the dependent variable with only a few using behaviour (Cvelbar et al., 2017; Dolnicar et al., 2017). Dolnicar et al. (2017) find that pro-environmental appeals do not help to improve PEB in hedonic tourism contexts. To this end, they suggest motivating tourists for PEB with more tangible benefits. Cvelbar et al. (2017) use the segmentation approach to identify the

most pro-environmental tourists in the hotel and suggest that domestic tourists act more pro-environmentally because they feel more responsible for the environment of their own country, which can also be related to the normative impacts.

Justification for not acting pro-environmentally. The green cluster includes studies describing the gap between PEB awareness, intention and pro-environmental behaviour. Therefore, while norms are good predictors of intention, they do not fully transfer into the actual PEB due to either objective reasons, such as a lack of the infrastructure or subjective self-excuses (Juvan & Dolnicar, 2014) and a complete denial of the consequences of behaviour (Hall et al., 2015). In addition, this cluster highlights that in the vacation context people are more likely to justify not acting pro-environmentally (Juvan & Dolnicar, 2014; Vaske et al., 2015). Moreover, León, Araña, González, & De León (2014) perform tourist segmentation based on their willingness to pay a lower price for a tourist product and consequently be exposed to higher risks of climate change impacts. The gap between the willingness to accept and the willingness to pay depends on the type of the risk and socioeconomic characteristics of a tourist, but generally demonstrates the endowment effect, in other words, tourists value their losses more than they are willing to pay to avoid them (Kahneman & Tversky, 1979; Thaler, 1980 in León et al., 2014, p. 851). Further, Horng and Liaw (2018) find that scientific information about tourist behaviour consequences have a better effect on the PEB intention than appeals with the shared responsibility for the environment. Authors attribute this to “social loafing”, which denotes putting fewer efforts in the collective action compared to acting individually (Karau & Williams, 1993 in Horng & Liaw, 2018, p. 2).

Different stakeholders and PEB. The purple cluster takes the perspective of different stakeholders in relation to PEB in tourism. Studies aim to offer the supply-side actions and actions, related to corporate social responsibility to encourage PEB. Chou (2014) and Wells, Taheri, Gregory-Smith and Manika (2016) cover the studies from the tourism employee perspective. Those studies mainly focus on personal norms, awareness and the knowledge of environmental issues and self-efficacy, offering the CSR actions to improve employees’ micro-level PEB. For residents in tourist sites, personal norms are the strongest predictor of self-reported PEB (Zhang et al., 2014), while a study involving tourists in a national park shows that egoistic values negatively impact the environmental concern. Imran, Alam and Beaumont’s (2014) study includes multiple stakeholders of the national park, from local communities, protected area authorities, tourism enterprises to tourists, in order to demonstrate that stakeholders differ in their value orientation towards the environment and the intention to engage in PEB.

Environmental awareness. The yellow cluster in Figure 5 describes informational strategies focusing on emotional connectedness, awareness, knowledge and education. To encourage PEB (intention), the interventions that educate tourists about wildlife and appeal to tourists’ emotions are used during and after the visit (Jacobs & Harms, 2014; Wheaton et al., 2016). Teng, Horng, Hu and Chen (2014) explore the level of energy and carbon literacy of hotel employees and suggest evoking affective and attitudinal responses by the organizational culture. Miller et al. (2015) offer the concept of tourist social responsibility,

which means tourists' readiness to take action instead of waiting passively for good conditions to perform PEB. Social responsibility requires a high level of awareness and strong motivation to act regardless of the obstacles.

Place attachment. Similarly to the co-citation analysis, bibliographic coupling also has a separate cluster (blue in Figure 5) for the human-environment relationship. Place attachment develops as a result of the experience with a place (Beery & Wolf-Watz, 2014; Buonincontri et al., 2017; Wolf et al., 2015) and it helps to turn the concern for the abstract concepts of "environment" or "nature" into more practical steps to preserve a particular place (Beery & Wolf-Watz, 2014). While place attachment is more strongly related to place-specific behaviours, studies also report its impact on the general PEB (e.g. Buonincontri et al., 2017). The cluster includes testing a relationship of the place attachment and the PEB components in different contexts: marine and coastal environments (Tonge et al., 2015), cultural heritage sites (Buonincontri et al., 2017), outdoor and nature-based tourism (Beery & Wolf-Watz, 2014), guided tours in national parks (Wolf et al., 2015), coastal litter and communities in tourist destinations (Kiessling et al., 2017), and cultural tourism in an island destination (Ramkissoon, 2015). All of the above are nature-based tourism or activities in protected areas.

4. DISCUSSION AND CONCLUSION

The bibliometric analysis applied in the research allowed us to overview the existing tourism pro-environmental behaviour literature. Firstly, we identified the most influential publications with the co-citation analysis. The latter is represented mostly by norm-based theories and frameworks applied to the tourist PEB, attitude-behaviour gap, segmentation and place attachment topics. Secondly, the analysis of the keywords demonstrated a shift in the topics over time. Based on the analysis, it can thus be concluded that PEB is no longer limited to a niche product such as ecotourism, but instead represents a switch to a sustainable development approach for the whole industry. Moreover, the most recent topics highlight the importance of environmental awareness, education and the development of the tourist-place relationship, which would enhance the quality of the interaction with a destination and thus stimulate PEB. Thirdly, bibliographic coupling summarizes the ongoing discussion in the tourism PEB. Some cluster topics are similar to those from the co-citation analysis, e.g. place attachment and normative drivers of PEB, and it is these that can therefore be considered as the core of the tourism PEB research.

A very limited set of theories has been used in the PEB tourism research to date. The most prominent are the theory of planned behaviour (Ajzen, 1991), the value-belief-norm theory (Stern, 2000) and the norm-activation model (Schwartz, 1977). These theories are framed by self-concept motives and are norm-driven. Self-concept motives make people feel good about themselves when doing good (Khan & Dhar, 2006). This means acting green is more appealing than acting greedy (Bolderdijk et al., 2013) and leads towards longer-lasting behavioural changes. This stream of literature emphasises the importance

of norms, values and attitudes in driving PEB, which is undoubtable. In addition, studies focusing on awareness and education as predictors of PEB are part of the norm-driven body of research.

Yet tourism is driven by desire to experience pleasure and is inherently hedonic. This stands in contrast to behaviours associated with responsibility. Moral norms as stimulators of PEB may have limited potential in the context of tourism (Dolnicar et al., 2017). This means that in addition to targeting self-concept motives, future research should pay more attention to other frames. A potential avenue can be the area of research investigating how to make PEB more pleasurable for tourists (Steg et al., 2014). Another stream of research that can bring new insights into the PEB tourism research is the focus on self-interest motives. The latter aim to maximise personal utility or benefits (Bolderdijk et al., 2013), emphasising that humans are willing to change their behaviour in exchange for personal benefits or rewards. Saving water or electricity on holidays would not reduce the costs of tourism services, so there is no incentive to behave environmentally friendly during holidays. And since so little is known about the efficiency of reward-driven or self-interest approaches in tourism, new knowledge in this area would be beneficial to both tourism research and businesses.

Another theoretical frame underused in tourism is the choice architecture focused on defaults (Thaler & Sunstein, 2008) in which individuals do not have to take actions regarding a particular choice. If a choice was green and not grey, we would record more environmentally friendly behaviours in tourists. More research using choice architecture would provide fresh knowledge in PEB predictors in tourism.

Furthermore, very few studies measure actual behaviour. In most of the cases, PEB intentions are used. The intention is easier to measure, however, given the high social desirability bias of pro-environmental questions, research cannot rely solely on the self-reported pro-environmental intention (Gifford & Nilsson, 2014). That is why future PEB research should focus more on measuring real behaviour rather than behavioural intentions.

Place attachment has proven important in explaining tourist PEB. In both the co-citation and bibliographic coupling analyses, we see that the place attachment clusters are spatially separated from the rest of clusters which are more compact. This can be attributed to the use of different theoretical bases, i.e. the nature connectedness and place attachment theory rather than the self-concept motives (e.g. the theory of planned behaviour or value-belief-norm theory). Also, such separation on the graph can be interpreted by use of the place attachment concept for the tourist PEB research in the natural areas, rather than all over the entire tourism contexts. The research on place attachment covers mostly nature-based tourism and protected areas, and is for that reason very likely to lead to biased results. In the future, the place attachment frame has potential to be applied beyond the protected area research (e.g. Buonincontri et al., 2017). Developing a meaningful

connection with a place could be used in many destination types to motivate tourist PEB. Future research should in addition focus on the segmentation studies identifying which socio-psychographic segments show high place attachment and could be stimulated to change their behaviour towards the environmentally-friendly one.

The role of the individual is crucial for climate change mitigation, and moreover, for the top-down governmental initiatives (O'Brien, 2015). However, the main goal is to use individual behaviours in order to stimulate collective changes in the society in the direction of climate change mitigation. A one-person activism does not necessarily stay on the individual level but may instead grow into a grassroots initiative, later becoming a political agency. This can be used to minimise the barrier of the insignificance of an individual's action either by providing access to the information about the summarised impact or connecting to the network of similar-minded people, serving as support and inspiration. The effect has already been demonstrated in political and social movements, pro-environmental initiatives, e.g. the ban on plastic straws (*No Straw Please — Plastic Pollution Coalition*, n.d.), outdoor community advocating against climate change (*Protect Our Winters*, n.d.), and numerous local initiatives aimed to protect the environment. With this approach an individual change of behaviour grows into a collective behavioural change, which is the ultimate goal. This could be achieved through a set of normative suggestions (policy implications) for an improved, sophisticated, experimentally- and behaviourally-informed policy intervention in tourism. The behavioural biases and patterns identified in the PEB research offer new insights into our understanding of the effects of different incentive streams and inducement mechanisms on the real human behaviour in a daily decision-making process. In the future, research should also focus on providing a normative set of suggestions for governments and tourism organisations based on advanced knowledge obtained from the behavioural PEB studies. Despite offering new insights into the field of the PEB research, this paper nevertheless has certain limitations. One of the limitations is the fact that only papers available in Web of Science were used, meaning the work published outside this database is not included in the study. Besides, as the selection of the search keywords could have impacted the results, our initial database did not include some of the important research work in the field, which were consequently added manually. A database search should therefore be supported by a search of the relevant publications through a traditional literature review. As regards the bibliometric method, it has its limitations. Although the method is based on the quantitative analysis, the interpretation of the clusters could lead to biased and subjective arguments. Another limitation is that due to the lag in citation, some important works may be underrepresented in the analysis. Based on this experience, we believe that for the future research a combination of the traditional literature review with software-aided methods would be the most appropriate and holistic approach to accessing and reflecting on the existing body of knowledge.

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