Exploring Place Attachment Theory in VR of a Rural Destination: The effect of VR Experience on domestic tourists' attachment to places

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PhD 2021

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A thesis submitted in partial fulfilment of the requirements of Manchester Metropolitan University for the degree of Doctor of Philosophy

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ACKNOWLEDGEMENTS

I would like to thank everyone who has helped me to complete my PhD. I am very grateful of my supervisory team. Thank you to my Director of Studies, Dr Mandy tom Dieck and supervisor's Dr Timothy Jung, Dr Amanda Miller and Professor Paul Smith for their support, knowledge, and expertise. Your area of expertise and comments were always helpful. Also being part of the team at the Creative Augmented and Virtual Realities (AR and VR) Hub I was able to support conferences that helped to expand my knowledge and network. Also, thank you for your support and being able to publish a conference paper and a journal article.

Further, I am also grateful to be part of Manchester Metropolitan University. I had the opportunity to work as Associate Lecturer helping to gain working experiences and to meet new colleagues. As a self-funding PhD student, I was very helpful to have that opportunity which made it possible to complete my PhD. Also, receiving additional funding for national and international conferences I was able to communicate my research to a wider audience and to expand my academic network.

I would like to thank my family, friends, colleagues, and everyone else who supported me on this long journey. I am grateful for your help and support. Also, sharing this experience with my PhD cohort in the Faculty of Business and Law made this journey more enjoyable. There were good and less good times, but we always stayed together. Thanks.

Finally, I would like to thank all the research participants who agreed to participate in this PhD. I would not be able to achieve my PhD without your valuable contribution.

DECLARATION

I declare that this thesis has been composed solely by myself and the work has not been submitted, in whole or in part, for any other degree or professional qualification. I confirm that the work submitted is my own.

Christos Pantelidis

July 2021

Abstract

Virtual Reality (VR) has the power to transform tourism experiences. VR can enhance the pre-, on-site, and post-travel stage by offering a range of new and innovative digital experiences. Place attachment (PA) theory can be described as people's emotional bond to places. One of the key aspects of developing PA is due to positive place experiences. Hence, the tourist experience represents a critical factor in forming attachments to destinations. In the last decade, PA studies in tourism have increasingly examined how tourists form emotional bonds to places. The benefits of PA may lead to a range of positive outcomes for destinations such as sustainability, loyalty or place satisfaction. However, limited studies have explored how immersive experiences impact tourists' attachment with destinations. Therefore, to address the gap, this doctoral thesis aimed to explore to what extent VR has an impact on tourists' experience and attachment to a rural destination. For this purpose, an exploratory sequential mixed method research design was followed. The research was carried out at the biggest national park in the UK, Lake District National Park. The sample for both data collection stages involved repeated domestic tourists. Within the first qualitative stage, data was collected by using semi-structured interviews and analysed using thematic analysis to reveal new PA themes in a VR setting. The new identified themes were accessibility, aesthetics, presence, memories, increased place knowledge and Increased Intention to Revisit and Place Attachment. The second stage included a questionnaire and included a larger sample of repeat tourists to test the proposed model. For this purpose, the PA framework was tested by using the partial least square analysis. The findings found a significant impact of VR on tourists' PA. However, the type of VR experience differed based on tourists' existing PA level. The theoretical contribution of this thesis lies in proposing and validating the PA framework by integrating VR into PA. Furthermore, the thesis also presented methodological contribution and practical implications.

Keywords: Virtual Reality, Place Attachment, Immersive Experience, Rural Tourism, Rural Destination, Lake District National Park.

Abbreviations

- AR Augmented Reality
- AV Augmented Virtuality
- CMB Common Method Bias
- CMV Common Method Variance
- EP Environmental Psychology
- HMD Head-Mounted Display
- ICT Information and Communications Technology
- LDNP Lake District National Park
- MM Mixed Method
- MR Mixed Reality
- PA Place Attachment
- PD Place Dependence
- PI Place Identity
- **PLS-** Partial Least Squares
- PLS-SEM Partial Least Squares Structure Equation Modelling
- SB Social Bonding
- SEM Structure Equation Modelling
- SoP Sense of Place
- VE Virtual Environment
- VR Virtual Reality

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Chapter 1 - Introduction

1.1. Introduction to study

Virtual Reality (VR) is part of the immersive technology family and considered one of the technologies with the power to transform the tourism experience (Yung et al., 2021). VR enables the user to be fully captured in a virtual environment and hence, excludes the user from the physical environment (Beck et al., 2019). This new VR opportunity opens a myriad of new experiences letting tourists to interact with destinations digitally. Recent studies demonstrated the popularity of VR (Griffin et al., 2017; Jung et al., 2017b; tom Dieck et al., 2018). This new type of experience in VR creates a digital experience in high resolutions within a highly immersive environment and enables users to engage dynamically in VR (Hu et al., 2021). In recent years, VR has shown to enhance the tourists' experiences in many areas such as entertainment, social interactions, accessible tourism etc. In this sense, VR offers a new type of experience and an innovative way of consuming tourist places expanding the tourist experiences (Bec et al., 2021). As immersive technologies increasingly become a part of the customer journey, VR is starting to be considered an innovative technology for tourism to add value to the tourist experience (tom Dieck and Han, 2021). On the other hand, also tourist destinations benefit from VR as part of the marketing campaign, site preservation, training, planning etc. (Tussyadiah et al., 2018). Hence, the application of VR in tourism is a benefit for all the stakeholders.

1.2. Research background and justification of the study

Place attachment (PA) describes the emotional link that people develop to meaningful places (Low and Altman, 1992; Scannell and Gifford, 2010a; Lewicka, 2011). These meaningful places vary from homes, community, cities to recreational places and other type of places. To date, much research focuses on residential areas and communities exploring PA for residents and their environment including recreational settings (Lewicka, 2011). Therefore, feeling 'at home' or 'in place' can also reflect individuals' emotional ties to destinations also referred as destination attachment (Yuksel et al., 2010). In the last decade, PA has gained popularity in tourism studies focusing on exploring the relationship of tourists and tourist destinations (Dwyer et al., 2019). In particular, PA demonstrated positive outcomes for tourist places, such as pro-environmental behaviour, place satisfaction (Ramkissoon et al., 2013) or destination loyalty (Yuksel et al., 2010; Prayag and Ryan, 2012). More recently, Dwyer et al. (2019)

summarised the key benefits of PA for a tourist destination to sustainability, destination resilience and destination competitiveness.

According to Scannell and Gifford (2010a), PA theory can be divided into three key dimensions: the person, the place, and the process. The person refers to who is attached, while place represents the attachment target. The process explains how individuals form bonds to different places. To develop an attachment to a place traditional research refers to mainly socio-demographic reasons and to environmental surroundings (Lewicka, 2010). However, a positive tourist experience can be considered as a key aspect for enhancing for tourists' emotional attachment level to a destination (Chen et al., 2014). This can occur while being on-site such as having a positive local food experience (Tsai, 2016). On the other hand, an attachment may also include the general past experience of tourists made at the destination level with various attractions (Loureiro and Sarmento, 2019). Hence, there are a number of different ways to impact tourist activities leading to a positive experience and consequently, enhancing the attachment to the destination.

Besides the individual tourists' experiences, the surroundings of a destination are also believed to be important for their attachment level. In this sense, the landscape, the scenery, and rurality are key characteristics for developing a bond (Jepson and Sharpley, 2015). In addition, aesthetic, wilderness and nature that offer recreational and restorative benefits are important for PA (Brown and Raymond, 2007). This positive image can be linked to the rural idyll that describes a peaceful and idealistic representation of a rural place in contrast to the urban environment (Woods, 2012). In addition, the romantic movement reinforced that perception of the natural environment as an unspoiled and beautiful landscape (Holden, 2016). For many tourists, all these meaningful features of a tourist destination are attached to rural places and part of their emotional bond.

However, the literature shows PA theory mainly considers the physical and social environments as part of people's bond to a place (Scannell and Gifford, 2010a). Nevertheless, technological advancements allow people to access virtual environments (VE) or places. One of these technologies is VR which can be defined as a three-dimensional environment, generated by a computer, where people can

move and interact in real-time by using one or more senses (Guttentag, 2010). For the tourism industry, this allows the creation of digital tourism experiences. Furthermore, technology-related tourist experience involves all stages of a tourism journey and hence, technology can be part of the pre-, on-site-, and post-stage tourism phase (Neuhofer and Buhalis, 2012). So far, VR research at the destination level is rarely applied. Hence, exploring the on-site experience within a fully immersive VR experience is lacking, especially within a rural setting (tom Dieck et al., 2018). Since the on-site experience takes place at the destination, the place aspect is a key dimension of PA theory (Scannell and Gifford, 2010a). Within the context of Information and communications technologies (ICTs) the relationship between people and places indicated the ability to enhance the attachment to a destination (Tussyadiah and Zach, 2012). Nevertheless, exploring VR within PA has been limited so far but the aspect of digital media is important since it allows individuals to interact with places (Gustafson, 2014). Further studies within the context of augmented reality (AR) and place attachment, studies identified the potential of AR at the destination level to enhance the tourist experience and consequently to have a positive impact on the attachment level (Chang et al., 2015; Oleksy and Wnuk's, 2017).

In this sense, VR has the potential to enhance the on-site tourist experiences. Thus, VR can be used in many ways such as being a promotional tool for tourist destinations or as a complementary experience affecting the behavioural intention. For instance, to express an intention to return or to recommend the destination (Tussyadiah et al., 2016; Jung et al., 2017b, tom Dieck et al., 2018). Therefore, VR provides many beneficial outcomes for tourist destinations but also allows to extent tourists' experience with new digital experiences. Regarding the aforementioned positive outcomes, the application of VR experiences has a tremendous potential to change the tourism industry in its current form. This might have a disruptive character but also provides new opportunities that needs to be discovered. Therefore, it is essential to explore the effects of VR on tourists since tourism is an important industry globally and responsible for economic growths worldwide (Page, 2019). However, despite being on hold as a result of the recent pandemic, for most tourism related businesses, it is expected that the tourism industry will recover in the next two years with an increased demand for nature-based and domestic tourism (World Tourism Organization, 2021). Consequently, rural tourist destinations will most likely benefit as they are an important part of a nature-based tourism. In addition to the recovery of the tourism industry in general, VR may also be considered as an alternative way of experiencing tourism during the pandemic (Ball et al., 2021). Escaping from daily life and going on holidays is very important for many people. However, due to the pandemic travel was restricted which may had a negative mental impact as travelling is part of recovering psychologically and physically. Hence, tourists experienced a disconnection from their favourite place. To maintain this important relationship VR could allow people to connect with their holiday destination digitally (Skard et al., 2021). This virtual interaction may provide a sense of continuation with the destination and potentially mitigate some of the negative impacts that could have been as a result of not being able to travel.

A great variety of different tourist experiences are offered by tourist destinations. In this sense, destinations are defined as a composite of different tourist products and services that offers a holistic consumer experience (Buhalis, 2000). Further, tourist destinations can be classified into three types, namely seaside, rural and urban destination (Holloway and Humphreys, 2012). Hence, tourist places offer experiences for all kind of tourists. For rural destinations, the main activities are in a natural environment such as National Parks (Jepson and Sharpley, 2015). In this respect, rural destinations are attractive places for visitors with a focal point of interacting and enjoying natural environments. Hence, this can be considered as one reason for an increased market demand for rural tourism. In particular, a higher demand for several outdoor activities, recreation in the countryside and contact with nature (Kastenholz & Lima, 2011; Kastenholz et al., 2012). However, there is also an increased competition for destinations (Loureiro and Sarmento, 2019). This can also be observed for rural destinations as they have to cope with stagnation and economic decline. The reasons may be due to market saturation and increased competition of other tourism such as cruise ship and urban tourism (Lane and Kastenholz, 2015). To overcome these obstacles, innovation and creativity are an essential part of rural tourism (Kurtyka-Marcak and Kutkowska, 2017). In addition, it is also critical to enhance the engagement between tourists and the destination in order to stay competitive (Loureiro and Sarmento, 2019). Consequently, new types of practices are needed to extend current tourist experiences and to enhance the value of the existing tourism consumption process. In this sense, recent studies demonstrated how VR technology can enhance

and add value to the on-site tourist experience for rural tourist destinations (tom Dieck et al., 2018; Mattila et al., 2020; Bec et al., 2021).

Furthermore, the importance of VR technology will be more evident in future impacting the life of newer generations. According to Nielson (2019), VR will play an important part in businesses and over 50 % of consumers see the benefits of using VR. In particular, generation Z mostly know digital experiences and 75 % believe that the VR experience will become a regular part of virtual experiences (WP Engine, 2017). This consumer trend will also be evident for the tourism industry and change the way tourist engage with the destination. In addition to new trends, tourism is also affected by crisis. A crisis in tourism is not a new phenomenon but when it comes to offering solutions, technologies are a major aspect as part of e-Tourism (Gretzel et al., 2020). This would not only benefit current visitors but could involve all kind of tourists and may be reflected within a destination's long-term marketing strategy.

Considering that a meaningful experience is a key part of PA theory, VR may enhance PA by enhancing the tourist experiences. This new type of experience allows tourists to interact with a destination digitally. In this context, emerging technologies such as VR may be even more important for newer generations and thus, destinations are prepared for future trends. The key benefits are twofold. Firstly, tourists may benefit by using VR to increase their emotional bond to the destination and thus, intensify their relationship. Secondly, because of the positive outcomes of PA, VR may also be beneficial for tourist destinations. In particular, VR provides a new and innovative tool to provide new experiences in order to gain competitive advantages.

Although the VR literature demonstrates an increased interest in tourism studies to examine the impact of VR experience on tourists (Tussyadiah et al., 2018), one of the key identified issues is the lack of theory-driven research in VR (Yung and Khoo-Lattimore, 2019). In this sense, only a handful of tourism-related studies have applied theoretical frameworks within a fully immersive VR context (e.g. tom Dieck et al., 2018; Kim et al., 2020; Wen and Leung, 2021; Flavián et al. 2019; Mattila, 2020; El-.Said and Aziz, 2021). This is also evident for VR studies in tourism that have rarely been addressed from a PA theory perspective. Moreover, due to the limited application of theoretical concepts in VR and PA, no existing PA models exist that can be either

tested or expanded. Hence, the implication of the VR experience is poorly examined and consequently, a PA framework is missing. Therefore, there is limited explanatory power on how VR experiences may influence tourist's attachment level to the destination. This identified gap in the literature needs to be addressed since VR experience has a great potential to transform the tourist experience and consequently, more research is needed. Therefore, to address the gap in the literature this doctoral thesis decided to apply an exploratory study design aiming to explore to what extent tourists' on-site VR experiences affect tourists' PA at rural destinations from a PA theory perspective.

1.3. Research Question, Aim and Objectives

To address the identified research gap in the literature the present study developed following research question: What are the key constructs and their relationships in understanding the impact of VR on place attachment for visitors in a rural tourism context? Based on the research question the main purpose of this study is to develop and present a PA framework within a rural destination in a VR context. Therefore, the research aim is to explore to what degree tourists' on-site VR experiences affect tourists' PA at rural destinations from a PA theory perspective using Lake District National Park (LDNP) as a case study.

To answer the research questions and to achieve the aim, three objectives have been developed:

Objectives:

1. To critically review the literature of place and place attachment, Virtual Reality and rural tourism as experienced by tourists

The first objective of this study links to a review of relevant literature of PA, VR and rural tourism. The first part of the literature review discusses the meaning of places. This is an important aspect as the place is the primary target of people's attachment object (Scannell and Gifford, 2014a). Furthermore, numerous research traditions contributed to the theory of place exploring different views from a wide range of research disciplines. Therefore, different place perceptions are discussed to provide an overview of different School of Thoughts demonstrating how people experience and interact with places. To some extent, this is also reflected in different definitions of PA and therefore, the definitions and key dimensions of PA theory are described. In

addition, due to the various perspectives in PA (Manzo and Devine-Wright, 2014), a summary of numerous conceptual applications is discussed. This also includes the wide range of empirical applications as PA is explored in many different contexts (Lewicka, 2011). In this sense, the chapter provides an overview of the developments of PA research in general, but also demonstrate its progress in tourism. Hereby the key benefits are outlined for the tourism industry. In addition, by reviewing the literature the research gap of this study was identified as PA represents the theoretical foundation of this doctoral thesis.

The second literature review chapter explores the VR literature demonstrating its technological development and importance for tourism. VR is not new, and many studies have focused on practical solutions. Besides the practical value, this chapter discussed also theoretical aspects. In this sense, the key elements of VR and VR experiences were presented. The aim was to identify the strengths and benefits of VR as part of immersive experiences. Therefore, VR was compared to other similar technologies to identify its strengths and to outline the differences. Further, the chapter showed how VR is explored and applied in environmental and tourism-related studies. By providing an overview of VR applications this chapter enabled to gain a better understanding of immersive experiences.

The third literature review chapter represents the context of this study is placed within a rural destination. In this respect, rural places possess certain characteristics that are different from other places such as urban environments. Therefore, this chapter pointed out the core aspects of rural places. Therefore, the term rurality was explained, and several definitions were outlined to get a better understanding of what constitutes rural places. This also included demonstrating the diverse conceptualisations of rurality that can be seen through different lenses. In this sense, there is a different perception between residents and tourists. These opposite views are manifested in the rural idyll that is one of the important factors for rural destinations (Woods, 2012). Further definitions and important aspects of this chapter included the nature, landscape and romantic movement as a key dimension of rural destinations. Hence, discussing the values and meanings that are attached to landscapes. Hereby, it is identified what key preferences are critical for tourists in developing bonds to rural destinations. Moreover, also the importance of rural destinations was described and including the challenges and opportunities for rural tourism.

2. To identify key constructs of a place attachment framework in the virtual reality rural tourism context.

The aim of objective two relates to the qualitative stage and represents research phase one of the thesis. This exploratory approach aims to identify new constructs to create a PA framework and consequently, addressing the gap in the literature. Since no existing theoretical or empirical concepts exist that can be further developed or modified, this stage demonstrated a crucial first step to develop a framework. In particular, this objective aimed to propose the first developed model within VR focusing on PA theory. Further, the interview findings of the qualitative analysis were discussed with the literature review. Hence, this objective combined primary and secondary research to fully develop the PA model. Based on the findings the relationships of the variables were identified and the hypotheses were formulated. Consequently, the PA framework was proposed and demonstrated the theoretical contribution. After successfully, achieving this objective, the PA model was ready to be tested in the next stage of the doctoral thesis.

3. To present and test the proposed place attachment framework for VR in rural tourism

This objective represents research phase two and is related to the quantitative part of the mixed methods approach. Based on the qualitative stage, the quantitative analysis purposes were to test the proposed PA framework. This study followed an exploratory based research and therefore, the model was tested by using Partial Least Square (PLS) analysis (Hair et al., 2014). According to Hernández et al. (2014), combining methods enhance the understanding of PA theory and following the authors' recommendations, a multivariate analysis should be applied to validate the accuracy of the proposed PA theoretical model. Hence, this objective of the doctoral thesis contributed to the validity and reliability of the proposed PA framework. To complete the purpose of this study and to answer the research question, the final PA framework will be presented and based on the final analysis the findings were discussed.

Overall, objective one represents the literature review and thus the theoretical foundation of the thesis. This includes also the identified research gap. The remaining objectives two and three relating to data collection, in particular, objective two is the qualitative method and objective three is the quantitative method. Objective three is also the final stage of the doctoral thesis and thus involves the main theoretical contribution.

1.4. Thesis Structure

The thesis consists of nine parts. The first chapter is the introduction to the thesis. The next three chapters (chapters two, three and four) relate to the literature review providing the theoretical foundation and study context. In chapter five, the methodology is described explaining how the primary research is conducted. The sixth chapter refers to the qualitative primary data collection and chapter seven involves the quantitative research phase. Chapter eight discusses the research findings of this thesis and chapter nine presents the conclusion. Overall, the PhD thesis has nine chapters that will be explained briefly below to provide an overview for readers.

1.4.1. Chapter 1 – Introduction

The introduction chapter provided the research background and the justification of this study. Furthermore, the research question, aim and objectives were presented. The goal was to provide an overview of steps in order to answer the research question of this study.

1.4.2. Chapter 2 – Place Attachment Theory

This chapter will aim to present the main theoretical foundation of this study. The theoretical and empirical concepts were defined. This was important to review since the aim of this study was to develop and present a PA framework. Therefore, key aspects of PA theory were explored to provide the current theoretical discussion. Moreover, since the context of the study is in tourism, it was significant to demonstrate the application of PA theory in tourism.

1.4.3. Chapter 3 – Virtual Reality

This chapter will provide an overview of the VR technology as a fully immersive technology. It was examined what are the key concepts of a VR and what constitutes

a VR experience. In this respect, it was important to point out the differences between VR and other technologies such as 2D applications. Moreover, various application of VR technologies within tourism were discussed.

1.4.4. Chapter 4 – Rurality

This chapter presents another context of this study. Since the research setting was within rural tourism, relevant concepts were discussed. Moreover, key characteristics of rural places were identified that are important for tourists. This enabled a better understanding of how tourists evaluate rural destinations. Further, it was important to understand the different place perceptions between tourists and local residents as tourists' relationships to a rural place might be different. By identifying the key elements of a rural destination, this chapter helped to explore the meanings and values that are attached to rural areas. As a result, the chapter helped to gain a better understanding of tourists' mindset that might be important for developing a PA framework.

1.4.5. Chapter 5 – Methodology

The chapter on methodology described how the study aimed to achieve objective two and three. Thus, all relevant details were presented of how the research was conducted. Since this study followed a mixed-method approach, the first stage explained the qualitative data collection. The second part described the second research stage, which represents the quantitative research stage. In both stages, the data collection process was described including instrument design, sampling methods and analysis techniques. The first research stage included semi-structure interviews while the second research stage described the data collection of the questionnaires. For both phases the data was gathered with domestic tourists at the Lake District National Park.

1.4.6. Chapter 6 – Qualitative Research phase – Exploratory Semi-Structured Interviews

This chapter included the qualitative analysis aiming to achieve objective two. Furthermore, qualitative analysis was designed in two parts. The first part related to the semi-structure interviews that took place at the Lake District. The tourists were asked questions about their VR experience after experiencing the VR application. Based on tourists' response the aim was to identify new constructs that were relevant for their attachment level and linking them to the PA theory. The second part of the analysis aimed to develop the PA framework. For this purpose, the newly identified themes and literature were combined, and hypothesis were developed.

1.4.7. Chapter 7 - Quantitative Research phase – Questionnaire

Chapter seven represented the second research stage which is the empirical part and involved to achieve objective three. Therefore, it aimed to validate and propose the final PA framework that was developed during the qualitative analysis from research stage one. For this purpose, the hypothesised relationships were tested by using partial least squares analysis (PLS-SEM). The first part of this chapter commenced with a descriptive analysis showing the key characteristics of the sample. Afterwards, the PLS-SEM process was described in detail and followed as suggested to test the relationships of the PA framework. Overall, the final and proposed PA framework had 10 hypotheses.

1.4.8. Chapter 8 – Discussion of Findings

Chapter 8 discussed the main findings by combining the results with the literature. The key findings were mainly drawn from research stage one and two and hence, representing the theoretical contribution of this study. In this sense, the proposed PA framework and the newly identified themes were discussed with literature findings from a PA theory perspective. In addition, also VR and tourism studies were presented and were part of the discussion with the own findings.

1.4.9. Chapter 9 - Conclusion

The conclusion chapter summaries how the objectives and research aim were achieved. In addition, the theoretical, methodological and practical contribution of the PhD study were identified. This also included limitations and recommendations for future studies.

Chapter 2 - Place Attachment Theory

2.1. Introduction

The purpose of this chapter is to discuss the meaning of place and how individuals interact and perceive their environment. This also includes how people form bonds and therefore, PA theory is explained which serves as the main theoretical foundation of this doctoral thesis. The first part introduces place theories and definitions. Afterwards, PA theory is presented describing how it has developed and an overview of various PA definitions is listed. Further, the relevance of PA within human-environment interactions is discussed by covering how people perceive and evaluate places. Moreover, the conceptual and empirical measurements are presented and critical points are analysed.

2.2. Place Theory

The term place is easy to understand but difficult to describe (Morgan, 2010). The reason is that it can be interpreted in several ways. First, it can refer to someone's home and indicate ownership of a property. Second, it can be used to signal privacy by referring to someone's home such as 'my place' or to a social hierarchy of a person's position such as to 'know your place' (Cresswell, 2004). Geographically, research in place discusses the subjective experience of embodied human existence in the material world (Morgan, 2010) and aims to give meaning to different place-based concepts such as Sense of Place (SoP) or Place attachment (PA) (Williams, 2014b). The topic of place exists in various disciplines, namely social sciences, humanities and natural sciences. The vast amount of literature related to the place in various disciplines adds to the confusion (Williams, 2014a). The researcher's challenge in the area of place lies in its different ontological and epistemological views on the reality of place (Williams, 2014b). Therefore, a place in different contexts can be seen as an object from diverse viewpoints.

The reason why place research is concerned with different epistemologies, questions and methods are that in social science researchers and participants are usually intertwined with places. These places can be local or global and are shaped by the culture and identities (Tuck and MckKenzie, 2016). Moreover, places can be seen as socially constructed and people experience different degrees of attachment and identification with places (Kyle and Chick, 2007; Kaltenborn and Williams, 2002).

Space is an abstract form of place (Tuan, 1977). The transformation process from space into a place starts when people give meaning to that space and when any degree of an interactional process happens. The notion of places is based on 'being memorable' and 'meaningful'. However, it is mostly emphasised that the built environment provides experience and meaning of that place (Milligan, 1998). These meanings are formed by experience coming from the physical place as well from the social environment. Thus, meanings vary due to the fact of different experiences made by people (Stedman, 2003). Table 2.1 provides several definitions of place and focusing on different aspects of place-specific features such as space.

Author	Place Definition
Aution	
Relph (1976)	They are three aspects of place, namely activities, different meanings and physical surroundings
Canter (1977)	A place consists of three aspects, namely activity, conceptions and physical attributes.
Tuan (1977)	A place is an abstract space and 'becomes place as we get to know it better and endow with value' (p.6).
Agnew (1987)	Place is a meaningful location and is combining three fundamental aspects, namely location (fixed coordinates), locale (physical setting as a background for social relations) and sense of place (emotional attachment to places).
Low and Altman (1992)	Place focuses on the environment where people are attached emotionally and culturally
Milligan (1998)	A place is a meaningful space.
Gieryn (2000)	Place has a geographic location which is unique and can be artificially or naturally build. Moreover, it is invested with meanings and values.
Gustafson (2001)	Place meaning refers to the self (e.g. self-identification, activity, life path), to others (e.g. characteristics and behaviour of inhabitants), and to the environment (Features of natural and built environment).
Cresswell (2004)	Place is a way of seeing, knowing and understanding the world. Further, he says that people are linked to places through meanings and experiences
Convery et al. (2012)	Place as <i>genius loci</i> describes people's engagement with places in terms of topographical, spiritual, build environment, emotional and psychological aspects.
Seamon (2014)	A place is not separated between physical environment and people; it is an integrated and unnoticed phenomenon of people-experiencing-place and characteristically multivalent, complex and dynamic.

Source: Author.

According to Massey (2005), space has three main propositions; it is firstly a result of interactions. Secondly, space exists in diversity and thirdly, it is a permanent construction. Furthermore, places are collections of stories in that space and moving between places means to move between stories where everyone relates to. For instance, joining meetings and conversations at work and checking posts at home (Massey, 2005). Consequently, place differs from space in the absence of a given meaning (Cresswell, 2004).

2.2.1. Virtual aspects of places

Similarities are made between physical and real places using virtual place metaphors and referring to positions (I am online), cyberspace (a space offering interaction and movement) and chat room (equivalent to a structural aspect). The position and the structure refer to a virtual architecture inferring from the built environment. For example, a building with many rooms could be equivalent to chat rooms with several sub chat rooms where people can move along them (physically or virtually) (Adams, 1997). Moreover, according to Sommer (2002) personal space might be used metaphorically in virtual space when referring to the privacy of computer-user interactions. It is only a matter of time when the virtual environment will overlap with the real world. For instance, surfing the internet is a virtual encounter with other people and simulates environments that act like a spatial place (Sommer, 2002). Stokols and Montero (2002) argued that the internet, digital communication technologies challenge the human environment in terms of describing different cyberspaces because technology such as the internet or the web simulates virtual places. This, he further argued, might impact people's attachment to their close environments. For example, the internet provides online experiences such as social networks that can act as a place and people might feel 'near', 'close' or 'right there' (Adams and Gynnild, 2013). Furthermore, applications like Google Street View can be used to visit places to get a first impression of the city. This is not only visual possible but also enables us to evaluate the character and the ambient of the city by picturing how it would be feeling to be there. Further, it is argued that watching media content of streets people become indirectly involved spectators of the social and physical environment. However, sensory experience such as seeing or listening differs from real experience and thus produces a different place experience (Bork-Hüffer, 2016). Thus, as Gifford (2014) argued that society has changed, people experience distant places and people through

screens, and video gamers see reality as an animation. The new reality needs an altered understanding between human-environment interaction and new approaches of people's perception and representation of the world. Considering that virtual places exist and will play an important role in the future, a place can be defined as a physical, social and virtual environment, considering people's activities, experiences, emotions and different meanings attached to a place.

2.3. Attachment Theory

The development of attachment theory is based on the work of John Bowlby (1969; 1983) and Ainsworth et al. (1974). Attachment to people, groups, objects and places are the essential experience of human beings. It provides security in a social and physical environment and links people to the past and affects future behaviour (Scannell and Gifford, 2014a). Moreover, attachment theory also means to feel good if close to someone we love and to be sad, lonely or even anxious if being away. For instance, being away can lead to homesickness for children and conversely, it affects the mother as well because she constantly is thinking about their baby. Attachment is mediated by hearing, looking and touching etc. and therefore it is aimed to reach proximity to relax and thus be able to explore the world (Holmes, 2014). An infant has five attachment behaviours to establish proximity and stay close to the mother (caregiver). It can cry (1) and smile (2) to bring his mother close to him. Further, to come and stay close the infant can follow (3) and cling (4) to the mother, as well as calling (5) the mother's name (Bowlby, 1983). If the infant can crawl it goes away from the mother and explores the environment. A returning to the mother occurs if the child gets hurt or the mother moves away (Ainsworth, 1967). This exploration behaviour is the opposite of attachment behaviour. People are motivated to establish a balance between these two positions. Staying close provides familiarity, security and reduces stress. Conversely, exploration allows extracting novel information from the environment. However, even though attachment refers to a feeling, attachment theory mainly relates to behaviour (Giuliani, 2003).

Attachment theory is described by three main aspects. The first aspect is searching proximity to a preferred figure. The second aspect 'secure base' provides a *safe haven* and thirdly, separation protest (Feeney and Noller, 1996; Holmes, 2014). However, an attachment bond is a specific type of bond of many affectional bonds.

Throughout the lifespan, people form several affectional bonds which do not involve an attachment (Giuliani, 2003; Cassidy, 2008). For example, people can develop relationships or bonds with different people such as partners or friends. However, a relationship is not the same as an emotional bond. The difference is that a relationship is interpersonal, short or long-lived and contains several components build over time through interactions. Contrary, affective bonds are characteristics of an individual, long-lasting and some components might be irrelevant when not presenting an attachment property (Ainsworth, 1993). Furthermore, certain attachment between adults seems to possess childhood attachment characteristics. However, not every relationship is likely to be an attachment, such as relations to parents, co-workers or friendships. The important aspect is if the relationship involves attachment properties (Weiss, 1993). The positive outcomes of such bonds are regulation of distress, emotional balance, safety and positive emotions such as relief, satisfaction, gratitude, thus it provides a positive feeling (Mikulincer and Shaver, 2008). Contrary, the attachment may also get disrupted leading to a separation process that might be responsible for psychological long-term problems (Scannell and Gifford, 2014a). For instance, a loss or bereavement results in grief and the reaction of a loss might be influenced by the type and strength of that bond (Parkes, 1993). Further, anxiety about a threat of separation leads to feelings of worry, pain, tension (Holmes, 2014), fear, angry protest, sadness and despair. Moreover, the possibility of a loss is considered to affect the state of well-being. However, after a longer period, the emotional reaction weakens and a process of detachment occurs accompanied by listlessness and reduced activity behaviour. The separation process is divided into three phases, 'protest', 'despair' and 'detachment' (Kobak and Madsen, 2008).

According to Belk (1992), attachment can also be established to tangible and intangible things. The former includes attachments such as pets, body parts, places, products etc. The latter involves attachment to experiences, symbols or names. All these things represent an attachment to possession. These different attachments share the aspect of defining someone's identity. Further, it provides people with a feeling of who they are, where are they coming from and where they are going (Belk, 1992). PA and attachment possess similar aspects of forming an affective bond between interpersonal relationships and relationships to places (Giuliani, 2003; Lewicka, 2011; Scannell and Gifford, 2014a). For instance, one key similarity is the desire to seek

proximity. This means for PA to seek proximity to a place including to return or to move to it. This also implies symbolic proximity if physical access is impossible. Another similarity involves multiple responses to less significant attachments. In the case of a place, this means people would choose between places as a substitute. If people feel protected the *save haven* aspect of a place serves as an environment for restoration and other various positive outcomes. As a consequence, people start to explore their surroundings (Scannell and Gifford, 2014a). This is probably associated with people's homes but does not have to be. For example, children can also have a secure base outside their home (Chawla, 1992). However, negative feelings such as pain or anxiety also happen between a person and a place. This might be caused by changes in a place or because of the potential and actual loss of a place. Emotions such as grief and other negative experiences such as stress disorder, anxiety or depression have been identified (Scannell and Gifford, 2014a).

The literature also provides a list of examples of other types of attachments then places. For instance, in marketing research brand attachment describes the emotional attachment of customers to a brand (Thomson et al., 2005; Japutra et al., 2014) or service brand attachment (Cheng et al., 2016). Moreover, consumer attachment describes people's attachment to a service organization (Brocato et al., 2015) or feelings to animals such as pet attachment (Chen et al., 2011).

2.3.1. Place Attachment Theory

In general, the PA concept provides an important framework of a great variety of different ways to explain people's development of meaning to places (Lawrence, 1992). PA has its roots in geography and environmental psychology (EP), exploring humans' attachment to their homes, communities and societies (Lee et.al, 2012). However, it should be considered that during their life stage people assign different meanings and importance to places (Rubinstein and Parmelee, 1992). An overview of several PA definitions that have emerged over the last years are presented in table 2.2.

Table 2.2 Overview of Place Attachment Definitions

Author	Definition
Shamai (1991)	"A place has a meaning; it is a centre of a personal and collective experience and that identity combines with the meaning of the place and its symbols to create a 'personality' of the place. The place is emphasized through ist uniqueness and through its difference from other places." (p. 350).
Brown and Perkins (1992)	"Place attachment involves positively experienced bonds, sometimes occurring without awareness, that are developed over time from the behavioral, affective, and cognitive ties between individuals and/or groups and their sociophysical environment" (p. 284).
Low (1992)	"Place attachment is the symbolic relationship formed by people giving culturally shared emotional/affective meanings to a particular space or piece of land that provides the basis for the individual's and group's understanding of and relation to the environment." (p. 165).
Low and Altman (1992)	"Central aspects of place attachment include 'affect, emotion and feeling' (p.4) are usually paired with 'cognition (thought, knowledge, and belief) and practice (action and behavior)" (p.5).
Milligan (1998)	<i>"Place attachment</i> refers to an emotional bonding to a site that decreases the perceived substitutability of other sites for the one in question" (p.6).
Hidalgo & Hernández (2001)	"A positive affective bond between an individual and a specific place, the main characteristic of which is the tendency of the individual to maintain closeness to such a place" (p. 274).
Guiliani (2003)	"Place attachment is seen as an umbrella concept embracing the multiplicity of positive affects that have places as targets" (p.150).
Hernandéz et al. (2007)	"Place attachment is an affective bond that people establish with specific areas where they prefer to remain and where they feel comfortable and safe" (p.310).
Scannell and Gifford (2010a)	"The bonding that occurs between individuals and their meaningful environments" (p.1)
Seamon (2014)	"Place attachment, which can be defined as the emotional bonds between people and a particular place or environment" (p. 11).
Cheng and Kuo (2015)	"Place bonding refers to the particular identity and emotional attachment that a user associates with an environment as a result of long-term interactions. Such bonding is a composite of a variety of factors such as emotional attachment, experiences, and meanings that individuals attribute to particular locations" (p. 546).

Source: Author.

However, it might be that people are not aware of having an emotional bond (Giuliani, 1991) as Relph (1976, p. 41) stated 'Although in our everyday lives we may be largely unaware of the deep psychological and existential ties we have to the places where we live...'. The concept of PA is a complex phenomenon and includes a number of different aspects of people-place bonding. One of the main characteristics is that affect, emotion and feeling are key aspects of this concept (Low & Altman, 1992; Guiliani, 2003; Hernández et. al., 2014). However, it also includes knowledge and beliefs as well as behaviour and actions (Kyle et. al, 2005). Furthermore, according to Rishbeth (2014, p. 100) "at the heart of any attachment is a story". She argued that people bring their own stories, developed over time and relate them to places, where each story
represents 'an intersection of site, time and human experience'. According to Seamon (2014), a person and a place are closely connected. Furthermore, he stated that place can be described from a lived dialectic, deriving from the holistic point of view for place attachment. PA is usually associated with positive links to places. However, also negative bonds exist. For example, people avoid places where negative events happen and thus do not want to get reminded. Moreover, also places are avoided where people could not express themselves (Manzo, 2005). Furthermore, cultural or ethnic conflicts also contribute to negative affective bonds to places. Thus, political, economic and religious reasons might play an important role in why people are negatively attached to an environment (Guiliani, 2003). Considering the definitions of place and PA, PA can be described as an emotional bond to environments, including cognitive and behavioural aspects as well as individual place-based experiences in physical, social and virtual places.

2.3.1.1. Related PA Theories

Besides PA theory, several other theories are explaining the relationship between people and places. Among these theories, attitude theory is referring to an attitude toward an object, person or place and might lead to a place-bonding (Harmon, 2015). Attitude to object, person, issue or event includes three categories such as affection or evaluation (feeling of person's) cognition (knowledge, opinion, beliefs and thoughts) and conation (behavioural intentions) (Fishbein and Ajzen, 1975). Based on the theory of reasoned action, which includes attitude theory, Ajzen (1985) further developed it to the theory of planned behaviour. Attitude can favour towards an object, which can also be an environment, referring to an affective, cognitive and conative relationship with people (Jorgensen and Stedman, 2001). In literature, SoP as well as PA have been related with attitude theory (Jorgensen and Stedman, 2001; Ramkissoon et al., 2012). In a recent study, the authors Anton and Lawrence (2016) examined the relationship between PA and theory of planned behaviour to people's place protective actions. Moreover, Halpenny (2010) applied PA and environmental attitudes to study proenvironmental behaviour in a national park. However, this theory focuses on the evaluation of the behaviour. Furthermore, certain planned behaviour might not be achievable because of the lack of experience of the person. Thus, the evaluation changes with more experiences.

The theory which describes the relationship between people and the natural environment for restorative reasons is called attention restoration theory (ART). The restoration processes involve four aspects. Firstly, people have a feeling of 'being away' and thus, faces no distraction. Secondly, 'fascination' refers to attention that is engaged without any effort and involuntarily by exploration of the environment. The third aspect is 'extent', referring to the size of the environment that can be experienced. Lastly, 'compatibility' includes the intended, necessary and possible person's activities (Kaplan and Kaplan, 1989; Staats et al., 2003). These restoration qualities may be perceived in every environment (Kaplan, 1987). However, in a study about researching different types of environments, it is argued that biomes such as tundra and coniferous forest are preferred (Han, 2007). However, commercial settings might also contribute to people's well-being and health (Rosenbaum et al., 2009). For instance, in bars or cafes, elderly people can receive social support such as emotional support (discussing private matters with others), companionship (feeling of friendships) and instrumental support (getting help from others). This social support, as well as perceived restoration qualities at commercial places, may also lead to a bond to a commercial building (Rosenbaum et al., 2007; Rosenbaum et al., 2009; Rosenbaum and Massiah, 2011). In addition, spirituality contributes as a source of restoration and thus sacred places are also important places (Ouellette et al., 2005). Therefore, several places might provide a sense of well-being to people and thus, people give meaning to these places and might attach themselves to these places.

Another theory that can be considered is about motivation. To examine motivation to go to a place can be explained by 'push' and 'pull' factors. For instance, the image building process starts if a destination offers certain qualities providing the capability to fulfil needs and satisfy them. 'Push' elements include psychological, security, belonging and love, self-actualisation etc. needs. 'Pull' factors involve landscape, climate, culture elements, services, promotion, price etc. Thus, 'push' factors are driven by people's needs and 'pull' factors are potential aspects in order to fulfil these needs (Lubbe, 1998).

In line with the research literature, among all the relevant theories, PA theory is uniquely relevant for this study. There are two reasons for this argument and the application of PA in this research context. Firstly, PA is a theory with a specific focus on place. While other relevant theories are using the place as a platform for identifying and researching different people's attitudes, beliefs, and behaviours with a place, PA is using the place as a space of formation of these attitudes. Therefore, in the context of PA place becomes a vital aspect of the theory itself. Secondly, PA theory is unique in its complexity, mutually combining different aspects and relationships to the place. Other relevant theories are usually focusing on one aspect of the relationship between people and places. However, PA theory is complex, able to simultaneously address different aspects of the relationship between people and places. For these two main reasons, PA has been applied in this study.

2.4. PA in the context of Human-Environment Interaction

The systematic study of links between the person and places started in the mid-1960s with the study of Fried (1963), where people were relocated and firstly documented the emotional link between people and place. In the 1970s, there was an increased interest in person place bonding including studies by Tuan (1974) and Relph (1976), which followed a phenomenological approach (Scannell and Gifford, 2014a). This was a reaction to the positivistic view of the place in the 1950s and 1960s, defining place as a physical location (Kaltenborn and Williams, 2002). According to Relph (1976), attachment or familiarity to places lies in the rootedness in places with a sense of deep care and is an important human need.

PA can be found in many different research disciplines such as geography, gerontology, architecture, marketing, psychology and sociology etc. (Low and Altman, 1992; Lewicka, 2011). For instance, sociologists focus on the symbolic meanings of places and their effect on human interaction. Geographers distinguish between space and place and relate to places as meaningful and calling a SoP. Similarly, architectural disciplines refer to meaningful places to create a SoP, however in terms of their physical shape and qualities and emphasising the built environment to create meaning and less the individual experience (Milligan, 1998). On the other hand, PA in psychology such as environmental psychology or community psychology focuses on cognitive, affective and behavioural aspects. The latter explores effects on community development and urban planning while the former deals mainly with well-being, feelings and other aspects on people from build, natural and social environment (Dallago et al., 2012; Mihaylov and Perkins, 2014).

In the field of anthropology, PA aspects include cultural dimensions of the daily life of places (Dallago et al., 2012). Also, gerontology examines the attachment to places throughout the life course and focus on older people how their experience and memories formed and changed place attachments (Rubinstein and Parmelee, 1992). In marketing, for instance, tourism destinations investigate PA in connection with loyalty and thus examine the revisit behaviour of tourists (Tsai, 2012). An overview of different research disciplines is summarised in figure 2.1. This demonstrates the diversity of research communities impacting PA theory.



Figure 2.1: Different disciplines in place and PA research Source: Author.

Despite the great interest in research on people place relationships, no single research journal is solely devoted to that research area. Most PA research however is located in the field of EP (Lewicka, 2011). The two main research areas of EP are perception and social psychology. The former focuses on how people interpret their environment of received stimulations and thus try to make sense out of it. Social psychology is the study of how other people influence one's behaviour (Cave and McIlveen, 1998). The psychological process of PA is the most frequent source of defining PA (Low and Altman, 1992).

The most central aspect in EP is the study of relationships between a person and environment dynamically, by changing and adapting the environment continuously (Levy-Leboyer, 1982). The fundamental psychological process focuses on perception, cognition, personality development and social learning referring between human behaviour and environment (Stokols, 1977). Furthermore, EP deals with the natural and built environment, where the social environment is steadily apparent (Levy-Leboyer, 1982; Cave and McIlveen, 1998). A general model of the people-environment relationship as in figure 2.2 describes the interaction between people and the environment.



Figure 2.2: Process of Human-Environment Interaction Source: Cave and McIlveen (1998).

The environment relates to physical factors such as build or natural environments as well as social aspects such as personal space or territory. At the individual level every person perceives these factors and based on its perception an evaluation follows of these factors, both cognitive and affective, it leads to how a person thinks or feels about that environment. Finally, the behaviour of each individual is based on this entire process (Cave and McIlveen, 1998). Theories in human-environment relationships rely on two processes. Based on the cyclical model of perception in cognitive psychology Neisser's (1976), the first step described the bottom-up process and secondly the top-down process. The former process is the response directly obtained from the environment. This means that people analyse the information from the environment and interpret them. The latter process included experience with the new information obtained (Cave and McIlveen, 1998; Eysenck and Keane, 2015). However, these two processes occur simultaneously rather than sequentially (Eysenck and Keane, 2015).



Figure 2.3: Bottom-Up and Top-Down processes Source: Neisser (1976).

2.4.1. Environmental Perception

Environmental perception is an important aspect of EP. Further, it is the main source of information people receive from the environment (McAndrew, 1992; Tveit et al., 2006). As Gifford (2014, p. 565) stated 'All human existence is related to EP. This includes such fundamental processes as how we see the world, find our way around in it, deal with noise, manage the space between us, and engage-or not-in healthy levels of movement.' Thus, to establish a relationship, people have to become aware of it. Perception involves interaction between people and the environment, and it is experienced by multiple sensory channels. Moreover, it is a longer process because of the available information a person receives and interprets. The stimulation received by individuals has to be read into a single meaning. In case the environment is not perceived as a homogeny it might cause discomfort and thus a negative emotional state (Baroni, 2003). Thus, people perceive and recognise stimuli through the senses and respond or change behaviour towards the environment (Cave and McIlveen, 1998). Furthermore, it is important to frame fundamental theories to make assumptions of the person-environment relationship in terms of interpreting and perception of their environment. This allows defining the theoretical boundaries and research methods (Cassidy, 1997).

2.4.1.1. School of Thoughts of psychological environmental perceptions

Because of the importance of how people perceive their environment and how they people make choices different schools of thought have emerged to describe the psychological process of perception. The following table 2.3 summarises four different schools of perceptions with their characteristics.

Subjective	Human-Envir	Objective			
European School					
Gestalt School	Transactional School		Gibson School		
Köhler (1947); Koffka (1935); Wertheimer (1945)	Dewey and Bentley (1949); Kilpatrick (1961); Ittelson (1961); Stokols and Altman (1987)	Brunswik (1957) lens model	Gibson ecological theory (1979)		
Characteristics					
Phenomenological orientation	Person and environment are independent	Shifting focus on the characteristics of the environment	Driven by a bottom-up process		
Isomorphism	Focuses of a process rather than on person or environment as a single entity	External world matters	Focusing on external characteristics of the environment		
Worlds exist in form of their own environment	The outcome is similar to constructivist view (phenomic or psychological environment	Understanding the outside aspects	Sensory information represents the external environment		
Reality is defined by what appears	The unique outcome of the environment for each person (It is a product of the perception)	The environment contains information of the external world			
"The whole is greater than the sum of its parts"	A person has the power to choose between stimuli	Driven by a bottom-up process	Environmental stimuli possess information		
Grouping things together in order to make sense Constructivists approach	Different experiences affect the different perceptions of the environment	Probabilistic functional theory (Senses do not reflect the real world, however information obtained from the environment are used to make probabilistic judgements about the true environment)	The problem of identifying the stimuli		
World in the head guides people	Past experience guides perception	Perception depends on learning and experience	Perception is based on analysed information provided by the environment		
behavioural environment: Actions is based on own perception of the world Brain makes 'good forms' (meaning of Gestalt)		raziomorphic	Affordance' - meaning exists in the environment and thus different environments offer different things		
Gestalt laws of perception: Proximity (things which are close together will be grouped); Continuation (e.g. lines seen as continues even when crossed by other lines); Part-whole relations (identical parts are grouped as wholes) Concept of Life Space			The functional value will be determined automatically (e.g. for survival reasons)		

Source: Adapted from Bonnes and Secciaroli, (1995); Cassidy, (1997); Cave and McIlveen, (1998); Ittelson et al., (1974); McAndrew (1992).

Different schools of thought provide different psychological theories about people's perceptions and environmental characteristics. It can be divided between European and American School in the psychology of perception. In Europe the Gestalt school focuses on the phonemic world of people and the environment representation is what people perceive and thus environmental characteristics are less important. The own perception represents reality and everything that is outside is irrelevant. Thus, the geographical environment becomes a part of the individual experience (Bonnes and Secciaroli, 1995). The reason why the external world is not important is that the world exists in people's heads which guides them. Moreover, constructivist research originates from the Gestalt approach (Cassidy, 1997). Furthermore, people perceive the whole environment as meaningful as Koffka (1935, p. 176) said 'the whole is more than the sum of its parts'. Thus, it is argued by Gestalt theorists that the brain is looking for forms such as filling gaps and see things that do not exist. Further, people group similar objects or perceive objects as parts that are closer together. Also continuation of lines is perceived as an entire line even it is crossed by other lines (Cave and McIlveen, 1998). It is a human need to simplify their perceptual world as clear 'figures' (McAndrew, 1992). The Gestalt theory is still important and is applied for example in vision research and computational modelling of 2D and 3D shapes (Wagemans et al., 2012; Kwon et al., 2016).

Ecological response to the phenomenological view of the Gestalt theorists the 'New Look' school from the United State is an answer to the dominant role of the European School (Cassidy, 1997). For instance, Brunswick's (1957) lens model explained that the environment provides information that is not exactly accurate. However, through experience, people make probabilistic choices about the external world (Cassidy, 1997). However, people actively structure their sensory information which is not accurate at the beginning but become more and more accurate with combining experience which leads to a more precise view of their environment over time (McAndrew, 1992).

The Gibson school argues that people's perception is innate and the sensory information obtained from the environment is accurate. Moreover, Information provided by the environment where Gibson relates to 'affordances', indicating several activities can be provided such as safety, comfort or recreation (McAndrew, 1992). Further, the

main aspect lies in the characteristics of the environment and information is stored in the stimuli. However, a problem seems to be how this information is delivered. Further, perception focuses on external information rather than on people's senses. The meaning is derived from the affordances and thus is present in the physical environment (Cassidy, 1997). The perceptual focus lies about learning to the different responses of environmental qualities instead of stimulation of past experiences (Greeno, 1994).

The transactional school considers the person and environment as independent and focuses on the process of the interactional process. The outcome of this process is similar to the constructivist view of a phenomic environment. Further, people can choose the environmental stimuli and through interaction with the environment, they alter their perception about the world, which is a unique outcome (Cassidy, 1997). Further, reality and the human's perception are taking part in the same process and similar to the Gestalt theorists, the environment is the outcome and not the source of the perception. Moreover, individuals have an active part in determining these perceptions as well as considering their experiences (Bonnes and Secciaroli, 1995).

2.4.2. Environmental Evaluation

2.4.2.1. Cognitive process

One way to order the environmental information that people perceive is through cognition, allowing managing the incoming information obtained by the senses to put it in a logical order. People classify and encode surroundings to deal with them in the future (Ittelson et al., 1974). Cognitive processes are a central aspect of a person's interactions with the environment (Bonnes and Secchiaroli, 1995). Cognition is the process of the way people think about their experiences and in psychology, the term is referred to aspects such as thinking as attention, perception, memory, problemsolving and the development of attitudes (Cave and McIlveen, 1998). Cognitive psychology tries to explain how people receive and process information about the environment and thus give meaning to that environment. People develop cognitive schemata, blueprints or cognitive maps of the world (Cassidy, 1997). This kind of 'mental mapping' represents images are formed in one's mind (Ittelson et al., 1974).

environmental information, resulting in what aspects will be stored in memory and to what aspect people respond. Concluding, it can be said that the environment provides different important perceptual information and shapes people's perceptual process by defining the content of perceptual memory (Cassidy, 1997).

The cognitive process such as knowledge, beliefs and understanding about different aspects of their environment was the main focus of the beginning of studies on environment and behaviour. The affective component has not been considered as important. This has changed with the shift of the research towards homes, childhood environments, sacred places and residences. Furthermore, topics regarding social issues such as homelessness, relocation, mobility, changing family structure, crime and community development have emerged. Consequently, people's emotions toward places became important (Low and Altman, 1992). One reason for that change might be the circumstance that cognitive processes neglect meaning and affective dimensions (Carmona et al., 2010).

2.4.2.2. Affective response

Different people evaluate and prefer diverse types of environments and also react emotionally differently to different environments (Cassidy, 1997). Different spaces and places can evoke intense emotional feelings and thus people develop affective states towards, rooms, neighbourhoods and cities. People might feel love, hate, fear, desire, etc. and places can become for instance 'friendly' or 'threatening'. However, people will also react instead of just experience that place. They might reduce or enhance those feelings towards a place (Ittelson et al, 1974). For example, ambient aspects of an environment can affect people's feelings (McAndrew, 1992) and according to Russel and Snodgrass (1987) emotional, affective quality of an environment is a key aspect of establishing a link to a place. The quality of the emotion is a significant factor in determining a person's attitude and memories of that place and can influence people's well-being and health. Emotion is a complex construct and includes behaviours, physiological changes and subjective experiences (McAndrew, 1992). The main aspects of these experiences are pleasure or pain and depend on the outcome of the evaluation and awareness of the situational meaning (Frijda, 1988). Furthermore, emotions are divided into four categories, namely affective, cognitive, physiological and behaviour. Affective refers to please/displeasure experience which

in return causes attraction or repulsion. The cognitive part refers to a perception or evaluation of a stimulus, leading to an emotional activation. Further, the physiological part relates to states such as blushing and the last component, behaviour, refers for instance changing facial gestures or preparing to get ready for action (Baroni, 2003). These actions evoked by emotional responsible are called by Frijda (1988) 'awareness of state of action readiness' is a key aspect in emotion. Firstly, it means to go or to move away from it, as well as shifting attention. Secondly, evoking absolute excitement, meaning be ready for action but without knowing what to do. Lastly, it may also stop someone from losing interest (Frijda, 1988). Therefore, depending on positive or negative emotions, they influence the relationship between a person and the object (Baroni, 2003).

2.4.2.3. Environmental Meanings

There are two main aspects of human development concerning the physical environment. The first aspect refers to design attributes and relates to physical characteristics such as shape, length, distance, objects etc. The second aspect involves meaning attributes, implying names, roles, people, events, feelings, beliefs, values and attitudes associated with given design attributes in an environment (Ittelson et al, 1974). Thus, environments are repositories of symbols, meanings and values (Carmona et al., 2010). According to Gifford (1987, cited in Cave and McIlveen 1998) meanings are used to describe three processes, namely, as an attachment or feeling towards a place. Secondly, they can communicate, thus indicating the purpose of the place; lastly, meanings can signal its purposes of the place. Moreover, place meaning also refers to how people value a setting (Wynveen and Kyle, 2015). Furthermore, to be attached to a place can be considered to be equal to value a place (Schroeder, 2013). However, given meaning to a place such as home includes a variety of different meanings that can be attached to. For instance, it can mean a birthplace, a nation, a house (Moore, 2000). It is argued that the meanings people add to the landscapes derive from the experience in that setting and the attachment is formed by the collection of experience. However, memories and meanings are more present with people in place instead of the physical environment (Stedman, 2003). In this sense, three basic ways can be further distinguished of human transactions with the environment such as orientation, operation and evaluation. Orientation refers to the perceived position of the person, the prediction of future events and the decision of what to do next. Operation

relates to the actual behaviour of the person affected by the surroundings. Lastly, the evaluation refers to how efficiently the behaviour was in achieving certain goals (Stokols, 1977). Thus, people interpret the physical and social environment and evaluate their feelings and show different responses to it (Bonnes and Secchiaroli, 1995; Cassidy, 1997).

2.4.2.4. Behaviour

One of the first and well-known equations of behaviour is based on Lewin field theory (1951), where behaviour is the function of the person and the environment and the interaction is referred to as a person-in-context approach to understand behaviour. Research in psychology tended to focus on a single entity, either on the person or the environment. However, as Lewin argued, it is important to consider the interaction between the person and the environment (Cassidy, 1997). Furthermore, he believed that human behaviour was a result of permanent interaction of internal factors of a person's needs, values and feelings and with external factors perceived in a behavioural setting. Therefore, the behaviour was determined by internal and external influences of a person's experience. The equation represents Lewin's *life space* and includes the physical, social and cultural environment (Ittelson et al., 1974). Therefore, EP can be described as the study of transactions between individuals and their physical environment. This does include that the environment influences the person bas an effect on the environment (Bonnes and Secchiaroli, 1995; Cassidy, 1997).

2.5. Conceptual Framework of Place Attachment Theory

In general people-place attachment is multifaceted and involves several factors such as characteristics of the physical environment, landscape, people, experience and also include meanings that can be linked to a social, psychological and cultural context (Hammitt et al., 2006). Scannell and Gifford (2010a) argued PA has been applied to many different contexts and therefore several definitions exist. Likewise, Hidalgo and Hernández (2001) stated the different theoretical and empirical implementations of PA exist and therefore it may represent a challenge for a researcher. As a result, there is not a coherent understanding of the name, definition and methodological approach (Hidalgo and Hernández, 2001). For instance, PA, place satisfaction, place identity, place dependence, SoP, community attachment, sense of community (Lewicka, 2011), rootedness, insideness and environmental embeddedness (Kyle et. al., 2004a) are used to describe the link between a person and a place. Because of this diversity, PA definitions are dispersed in the literature. As a result, a three-dimensional framework of PA that includes the various definitions in the literature has been developed by Scannell and Gifford (2010a). This multidimensional framework (PPP-model) of PA combines the dimension of the person (group and individual), place (social and physical) and process (affect, cognition and behaviour). It is a simplified framework that aims to clarify the existing definitions of PA and should enable the researcher to place the definitions of their studies within the framework and its dimension to organize and synthesise easier in future. This embraces quantitative as well as qualitative research (Scannell & Gifford, 2010a). Devine-Wright (2014) confirmed that this framework helps and organise aspects of distinct and chaotic literature. However, he argued that it is still a static concept, neglecting the dynamic process between people and places and how they deal with changes in their physical setting and with consequences of relocation (Devine-Wright, 2014). Thus, because of its comprehensive and flexible character the PPP- model as shown in figure 2.4 is the theoretical model summarising the literature of PA of this research.



Figure 2.4 Summary of the Literature of PA Source: Scannell and Gifford (2010a).

2.5.1. People

The interaction with the landscape is considered to be divided into three parts. First, human interacts as a member of his species, meaning that human's attachment to the environment is considered invariant and inherent in the human species. Therefore, human beings prefer environments that were crucial in the evolutionary process (Riley, 1992). Furthermore, prehistoric humans needed to survive, and the environment was crucial to meet these survival needs. Despite it is not necessary to survive nowadays the tendency to choose the best landscape with special characteristics to help to satisfy these needs are still existing (Hunziker et al., 2007). In a physical environment, there are biological needs for humans. Every human being is a physically defined object in space and thus the same occupation of that object in space and time is not possible. From a physical, biological and social perspective, a person requires a minimum need of its exclusive physical space. As a result, all societies develop norms and values about human privacy, personal space, crowding and territoriality. These basic aspects are required for humans to meet their biological needs and conditions to exist and to satisfy biological and social needs (Proshansky et al., 1983). Humans are participants of a certain culture and subculture. This evolves as the landscape becomes more affected by humans by shaping it (Riley, 1992). According to Hayden (1997), the production of space starts when people settle down and start to build a town. It may evolve into a city and thus space is shaped for economic reproduction such as factories and social reproduction such as houses. This landscape shaping occurs over time and reflects societies and culture's beliefs, practices and technologies. Thus, different environments are shaped by different groups with their customs and beliefs (Crang, 2004) as well as material traits and social forms (Rubenstein, 2014).

The link between the culture of people and their landscape is necessary to understand the collective human activity. Moreover, the way of how people create specific regions influences human's institutions and habits. Furthermore, cultural attachments, as well as cultural attitudes, can be expected to show a relationship to a landscape if a culture is a response towards that specific landscape. The production of landscapes is also influenced by cultural traditions and technologies and a spread of different technologies, house forms and landscape values create national landscapes and distinct regions (Riley, 1992). Within the cultural environment, different cultural groups might exist divided by gender, sexual orientation or race (Rubenstein, 2014).

Attachment and feelings for the congruence of culture and landscape relate to regional and regional identity. This affection can scale from neighbourhoods to regions and nations (Riley, 1992).

Furthermore, PA can also be understood as a symbolic relationship formed by people and giving a shared culture and emotional meaning to a certain environment. This provides a basic understanding of individuals and groups towards that environment. PA involves more than emotional and cognitive experiences; it includes also cultural beliefs and practices that bind people to places. Therefore, the cultural meaning of PA implies that for the majority of people there is a transformation of the experience of space into a culturally meaning and shared symbol. There are six identified symbolic bonds such as (1) genealogical, by (2) land destruction, (3) economic link such as ownership, (4) cosmological through spirituality or mythological, (5) religious and pilgrimage and lastly (6) narrative bond through storytelling and place naming (Low, 1992).

The individual aspect includes its life, body experiences are considered to be important of PA. Furthermore, it is argued that the emotional attachment pattern to be a product of the childhood experience (Chawla, 1992; Morgan, 2010). In general, children are attached to places where their physical needs and intrinsic qualities are satisfied (Chawla, 1992). It is said that children prefer natural places such as trees and water (Mahidin and Maulan, 2012). Different age stages produce different types of attachments and thus the child development is closely linked to the development of the personality, ranging from relative helplessness to self-actualization (Riley, 1992).

This experience moves through one person's life. Therefore, experience in older age, as well as themes of self-identity, are related to PA, which can be lived at the moment or as part of the memory. This is to consider in a wider context such as people's events in their life, the way of their interpretation and the requirement of keeping a coherent sense of self over time. Thus, PA is a process through an entire life with current and past personal experience and meanings given by people to those places (Rubinstein and Parmelee, 1992). The most powerful memories evolve in important places such as the house, secret places of childhood, the first place where people fell in love, the summer home etc. (Cooper, 1992). Hence, environments relate to the subjective experience of people with the material world (Morgan, 2010).

2.5.2. Place

The place represents an important aspect because it is the target of the attachment (Scannell and Gifford, 2010a). Thus, PA is studied by different perspectives and applied to a variety of environments such as small-scale objects, moderate-scale homes, larger-scale communities, neighbourhoods, cities and regions (Low and Altman, 1992; Lewicka, 2011). For instance, attachment to ordinary landscape relates to a setting of human experience and activities. Moreover, the landscape can be defined as a household and can scale up to one's biogeographical region (Riley, 1992). However, it also exists a cultural landscape, which reflects cultural identities, telling more about people instead of the natural environment. Moreover, the interpretation of the landscape depends on the person, who encounters it (Greider and Garkovich, 1994).

Depending on different places people experience different social roles which change their identity over time (Peace et al., 2006). One place that is important by shaping identity is home (Porteous, 1977). It presents the place people come from and desire to return. Moreover, home can be categorized into two dimensions. Firstly, it can be described from the viewpoint of geographers as a spatial location and, secondly, as private and domestic ground. Furthermore, the idea of the home also stabilises identity and the longing for home can be considered as a need for security (Woodward, 2003).

2.5.3. Process

It is argued that studies focused more on the person dimension than place or process and thus little is known about the psychological process of how place attachment evolves. Even though several predictors are identified such as demographic, physical and social factors they do not explain the psychological mechanism of people (Lewicka, 2011). However, several processes were identified by Low (1992). For instance, genealogy refers to the bond between people and places through historical identification such as family. Moreover, if the bond breaks PA can be evoked through place destruction, exile, resettlement, disaster or redevelopment of land. The next process relates to an economic aspect such as work or ownership. Cosmological and religion include ideological aspects and thus people's PA process is mainly driven by a connection to sacred places. The last process emerges through story-telling based on myths or family histories (Low, 1992). A recent study examined and suggested similar processes of PA and includes further commodifying and material dependence aspects. The former involves a cognitive evaluation of place aspects and material dependence includes the aspect of physical and social attributes. Both aspects are related to the economic dimension (Cross, 2015).

The phenomenological viewpoint -people's lived experience at the place - of the PA process is dynamic and includes six people-place processes that transform places and feelings over time. The six processes are: (1) place interaction (daily routines), (2) place identity (identity regulation based on place interaction). These two aspects relate to the affective bond. The next two processes (3) place release (meeting unexpected experiences or events) and (4) place realisation (physical presence and distinctive character of the place) relate to the special character of the place through unexpected situations that evoke loyalty and love. The last two aspects are (5) place creation (active positive shaping the place) and (6) place intensification (improving place quality by designs, policies or construction) and involve place qualities that enhance daily life (Seamon, 2014). However, every process has its time aspect. For instance, PA is influenced by the length of stay in one place (Hay, 1998; Hernández et al., 2007). Besides this dynamic time aspect, each process possesses its time-related factor. For example, the historical process might increase attachment; the narrative process might influence attachment in both ways, leading to a stronger or weaker bond. On the other hand, the spiritual linkage is perceived as static and thus stays constant over time (Cross, 2015). Figure 2.5 presents the discussed PA processes.



Figure 2.5 Different PA processes proposed by the literature how PA is formed Source: Author.

2.6. Empirical Measurement of Place Attachment

2.6.1. Dimensions

PA has been conceptualised in different ways. For instance, Hernández et al. (2014) presented an overview of different models of PA, namely as a one-dimensional, multidimensional or superordinate concept as shown in figure 2.6.



Figure 2.6 Summary of empirical conceptualization of PA in PA literature Source: Hernández et al., (2014).

This diversity is an indicator of an increased interest in PA and the progress of its theoretical development (Scannell & Gifford, 2010a). However, Lewicka (2011) criticised in her review that studies of PA showed a lack of theory and little empirical progress in the last 30 or 40 years. Further, she claims that studies referring to classic authors turn out to be popular as they were more than two decades ago. Another critical point is that the same variables are predicting attachment and therefore some papers from the 1980s could be published nowadays (Lewicka, 2011). An overview of studies and their dimensions used to measure place attachment as a multi-dimensional model are presented in the following table 2.4.

Table 2.4 Identified Dimensions of PA of Empirical Studies

Author	Year	Place identity	Place depende nce	Affective bond	Social bondin g	Rooted- ness	Sociol involv e-	Nature bondin g	Family bondin g	Friend bondin g	Place memor y	Place expecta tions	Hom e/Fa mily	Place belongi ngness	Lifesty le	Hap pine ss	Place symb olism
Gerson et al	1977			x			x						-				
Riger and Lavrakas	1981			~	x	x											
Stokols et al	1083			x													
	1005			×													
	1002	v	v	^													
Maandrow	1992	^	^			v							v				
Bricker and	1992					^							^				
Kerstetter	2000	Х	Х												Х		
Williams and Vaske	2003	Х	Х														
Kyle et al.	2004 a	х	х														
Kyle et al	2004	x	x	x	x												
Hwang of al	2005	X	X	~													
Kulo et el	2005	×	×		×												
	2005	N V	N V		^												
Alexandris et al.	2006	X	X														
Hammit et al. Brown and	2006	X	X			X								X			
Raymond	2007	Х	Х														
Fulton	2008	х	х														
Gross and Brown	2008	х	х														
Yuksel et al.	2010	х	х	х													
Raymond et al.	2010	х	х		х			х	х	х							
Halpenny 2010	2010	х	х	х													
Tsai	2012	х	х	х													
Lee et al.	2012	х	х														
Ramkissoon et al	2012	x	x	x	x												
Kil et al	2012	x	x	x													
Ramkissoon et al	2012	x	x	x	x												
Lee and Shen	2013	x	x														

1	1	1	1	1	1	1	1	1	1	1	1	i .	1	1	1	
Cheng et al.	2013	x	x													
Chen et al.	2014	x	x	х	x						х	х				
Ramkissoon et al.	2014	х	x	х	x											
Ramkissoon and Mavondo	2015	х	x	x	х											
Tonge et al.	2015	х	х												х	
Cheng and Wu	2015	x	x													
Wirth et al.	2016			х												
Tsai	2016	х	x													
Halpenny et al.	2016	х	х	х	x											
Xu	2016	х	x	х	x											
Brown et al.	2016	х	х	х												
Xu and Zhang	2016	х	x	х	x											х
Luo et al.	2016	х	х	х												
Jiang et al.	2017	х	x	х	x											
Ramkissoon and Mavondo	2017	x	x	x	x											
Van Riper et al.	2019	x	x		x											

Source: Author.

Table 2.4 provides an overview of several authors and their empirical studies by measuring PA as a multidimensional concept. As it can be obtained the most used variables are place identity, place dependence, social bonding and the affective bond. However, a few authors also included several other variables, but recent studies included a three- and four-dimensional approach. Nevertheless, there are also studies referring PA towards a single dimension (Hwang et al., 2005; Prayag and Ryan, 2012; Ramkissoon et al., 2012; Zenker and Rütter, 2014; Gundersen et al., 2015; Ram et al., 2016; van Riper at al. 2019). PA as a subordinate concept can be found by studies of SoP (Jorgensen and Stedman, 2001; Stedman, 2006).

In the 1990s, one measurement tool of PA was introduced by Williams and Roggenbuck (1989) and was later used by Williams et al. (1992) to measure PA. According to Harmon (2015), it delivers a foundational methodological effort and the main indicators for measuring PA are place identity and place dependence (Kyle et al., 2005; Kyle and Chick, 2007; Raymond et al., 2010; Williams, 2014a; Harmon, 2015). Both dimensions are most widely used, for instance, in recreational and residential settings (Chen et. al, 2014) or literature on EP (Jorgensen & Stedman, 2006).

2.6.1.1. Place identity

When describing the PA dimension, identity plays a key role. Every person has a self and a social identity. The self-identity distinguishes a person from others by being reflexive and thus categorises, classify or name itself (Stets and Burke, 2000). However, social identity indicates a person's social and group membership (Twigger-Ross et al. 2003). Moreover, identity with place deepens the understanding in terms of how a place affects people's social and psychological development. Thus, the term place identity is a key concept in EP and its definition was first mentioned by *Proshansky et al. (1983)* (Gieseking et al., 2014).

Place identity is defined as:

'a sub-structure of the self-identity of the person consisting of, broadly conceived, cognitions about the physical world in which the individuals lives. These cognitions represent memories, ideas, feelings, attitudes, values, preferences, meanings and conceptions of behavior and experience which relate to the variety and complexity of physical settings that define the day-to-day existence of every human being.' (Proshansky et al., 1983, .77).

Thus, place identity can be referred to as an important symbolic meaning between the environment and one's self-identity (Harmon, 2015). This also includes its confirmation (Kyle et al., 2005). Therefore, it can be defined as a connection between the self and the place with cognitive and affective elements (Ramkissoon et al., 2013). It can be interpreted as symbolizing or situating the identity by using environmental meanings and asking, 'Who am I' to questions 'Where am I' or 'Where am I' (Cuba and Humman, 1993). The self-identification process starts when the child can distinguish between him and other objects and thus place identity also starts to emerge (Chawla, 1992). In later life, memories remain of places from childhood through reminding people from where they are coming from and thus it represents a strong emotional feeling. Likewise, positive experiences in different places form the meaning of that place and therefore people recollect such important events in their life (Cooper, 1992; Rubinstein and Parmelee, 1992). However, it is also argued that PA vary in terms of quality and strength and thus adults might associate negative feelings with their place of origin. Therefore, childhood memories might be partially important when adults form their identity and thus the link might be unclear (Moore, 2000).

In this context, several authors described a specific place identity such as community identity (Hummon, 1992; Manzo and Perkins, 2006), settlement-identity (Feldman, 1990) or destination place identity (Dredge and Jenkins, 2003). However, because of the lack of a transformation process of place identity Twigger-Ross and Uzzel (1996) suggested four process dimensions and it is based on Breakwell's model of identity. The first dimension 'distinctiveness' relates to a person's wish to be different or unique from other people. The second dimension is divided between 'place-referent continuity' and 'place-congruent continuity'. The former relates between the past and present and thus a person wants to maintain in the known environment. The latter relates to maintaining the characteristics and values of places. The third dimension 'self-esteem' involves a positive feeling of being in that place. The last dimension 'self-efficacy' describes the ability of a person to meet certain demands and thus the daily life is manageable. Further, the process aims to develop and maintain identity (Twigger-Ross and Uzzell, 1996). In a recent study by (Davis, 2016) it is argued that place identity can also be formed without PA and also the reverse case which is less common, but together they develop the strongest bonding. Here, place identity is

formed first without any experience, whereas PA happens with experience. Thus place identity and PA may exist independently (Davis, 2016). The different concepts might also result because PA usually refers to the emotional link and PI relates to place attributes, such as physical, meanings and values that contribute to self-identity (Jaśkiewicz, 2015). One reason for being used as a synonym might result from studies examining local people. This might relate to a high correlation of concepts and thus it is difficult to distinguish between those. Consequently, a person might be attached to a place and does not identify with it. This also accounts for the reverse case. Moreover, PA and PI show similar behaviour for natives and differ in the case of non-natives (Hernández et al., 2007). This definition of PI is mainly derived from positivistic research approaches. On the other hand, phenomenologists such as Seamon (2014) described PI as a relationship between a person and a place where the place is an important part of people's life. Further, they might be aware or unaware of their connection, but it is a part of their self and social identity. Thus, the mutual interaction allows people to feel the place and this process relates to the identity (self and social) between the person and the place (Seamon, 2014).

2.6.1.2. Place dependence

The second dimension is defined as place dependence and was firstly introduced by Stokols and Shumacker (1981) which has been applied in several studies (e.g. Mihaylov and Perkins, 2014; Cross, 2015). It is reflecting the functional attachment to a place. In particular, place dependence describes the physical characteristic of a place and can be considered as establishing harmony between an individual and a place in a continuing relationship with the setting. Furthermore, it might involve a long-lasting relationship (Williams and Vaske, 2003; Chen et al. 2014). Hereby, a place is assessed to what extent it fulfils a person's needs and goals. This also involves a comparison of other places to identify the best environment. Consequently, place dependence can be considered as to how strong a place can satisfy a person's physical requirement that plays a key role to interact with the environment (Williams et al., 1992). Raymond et al. (2010, p. 426) defined place dependence as:

"Functional connection based specifically on the individual physical connection to a setting; for example, it reflects the degree to which the physical setting provides conditions to support an intended use". This need to satisfy a person's goal can be expressed through motivational behaviour. Motivation can be divided into two behavioural components. The first one called the energetic one referring to activation. The second one describes a directional behaviour, thus it directs to a goal. Moreover, psychological motivation might aim for personal or cultural achievement (Baroni, 2003). For example, in tourism, this might describe how important the place is to someone to achieve its recreational goals (Harmon, 2015). However, Cross (2015) expanded the term of PD to material dependence referring to features such as housing, job market or environmental features as well as social dependence including family or friends. Both aspects are important for well-being at the place. For instance, people might be dependent on a job or house because they don't have a choice. This also accounts for social dependence as, for instance, children cannot choose their neighbourhood or city. Thus material dependence is a lack of freedom. Consequently, PD also limits people in the choice of their destination (Cross, 2015).

2.6.1.3. Social Bonding

Social bonding is another PA aspect besides place identity and place dependence. In particular, the dimension was added within a recreational context (Kyle et al., 2005). One of the reasons to add social bonding is that the social environment is perceived as an important element which is also supported in the literature (Low and Altman, 1992). For example, Hidalgo & Hernández (2001) explored the social and physical PA to three different scales. They measured PA in the context of house, neighbourhood and city and found that a higher attachment is found to home and city and less to neighbourhood. Another approach as showed by Raymond et al. (2010), refers to the importance of social ties and introduced family and friend bonding. Moreover, synonym words exist for place attachment such as community attachment including besides the physical aspect the social bonding to places (Riger and Lavrakas, 1981). Consequently, the social environment and all social actors can be considered as a key aspect in people's PA formation process (Low and Altman, 1992; Low, 1992; Cross, 2015).

2.6.1.4. Affective dimension

Place-affect can be considered as an additional single dimension in PA measuring the emotions and feelings between people and places. However, this affective dimension is unsuccessfully measured to exist independently, thus loading on place identity and place dependence. Moreover, it is considered to act as more as a general concept (Jorgensen and Stedman, 2001; Halpenny, 2010). On the other hand, these four dimensions (place identity, place dependence, place affect and social bonding) are tested as an all-embracing concept of measuring PA (Ramkissoon et al., 2013). However, different dimension in the literature includes nature bonding for rural and natural environments (Raymond et al., 2010) or even lifestyle (Bricker and Kerstetter, 2000). Another approach including landscape values to measure PA identified wilderness and spiritual values as important predictors (Brown and Raymond, 2007). However, the most important variables that occur in all PA studies place identity and place dependence.

2.7. Formative-Reflective Model Decision

There are several ways to design a measurement model. For a hierarchical model, four types of model specifications can be distinguished. In this sense, it can be chosen between a reflective and a formative model or a combination of both (Becker et al., 2012). According to Diamantopoulos et al. (2008), research areas such as psychology, marketing or business show a higher interest in formative models. However, as the authors further argued, less attention is paid to what type of model is appropriate. In this respect, as noticed by Diamantopoulos and Winklhofer (2001), does the high number of analysis tools for CB-SEM lead to an automatic agreement for applying reflective models. This has to be carefully considered as the consequence may lead to a misspecification of the model (Jarvis et al., 2003; Diamantopoulos et al., 2008). For instance, it can lead to false conclusions about structural parameter estimations and therefore to wrong hypothesized relationships between constructs (Jarvis et al., 2003).

Moreover, the causal paths between the constructs may lead to an overestimation or underestimation and thus, affecting the interpretation of the overall SEM (Diamantopoulos et al., 2008). For instance, several authors have identified false specified models that should be rather formative instead of reflective (Petter et al. 2007; Jarvis et al., 2003). However, according to Chang et al. (2016), in some situations both approaches are possible. In some instances, it also depends on the researchers view following a construct-centric view or an item-centric view. In this line, different research traditions may be in favour of a reflective or a formative approach (Wilcox et al., 2008). Hence, ontological consideration about the latent variables may be important referring

to the nature of the construct. In this respect, a realist view involves the construct as existing independently and is reflected through its items. On contrary, from a constructivist view, the items form the construct (Borsboom et al., 2003).

In this respect, PA studies in tourism and leisure have shown to apply both approaches as a second-order model referring to a latent variable that is informed by other latent variables. Both types of model can be found in the literature, namely, as a second-order reflective model (Ramkissoon et al., 2013; Prayag and Ryan, 2012; Cheng et al., 2013; Chen and Dwyer, 2018) using CB-SEM but also as second-order formative models using PLS-SEM (Loureiro, 2014; Hosany et al., 2020). According to Beckers (2012), classification of hierarchical latent variables models, PA studies use the Reflective-Reflective Type I assuming that PA is reflected by other latent variables which in turn are reflected through its indicators. The second type of model refers to the Reflective-Formative Type II model indicating that PA is formed by latent variables which in turn are reflected by its indicators.

However, there is a lack of explanation why PA should be measured as a formative model since past studies seemed to favour reflective approaches. This lack of explanation is also present in tourism studies (do Valle and Assaker, 2016). To bring more clarity, the decision-making rule was followed by Jarvis et al. (2003). The following table 2.5 provides an overview of the key questions and accordingly the PA analysis.

Decision rule	PA Analysis
1. Direction of causality:	a) 1 st Order dimension no. But in the 2 nd order
a) Are the indicators defining the characteristics	dimension yes. PA is a subjective judgement
of the construct? Formative-Yes / Reflective -	(Lewicka, 2011) and tourists' experiences and
No	perceptions are constructed. Hence it can be
	argued that the first-order variables form the
	attachment and PA as a latent variable does not
	exist independently. Therefore, causality is
	coming from the indicators to the construct. In
	this respect, 'Place Identity', 'Place Dependence'
	and 'Social Bonding' are forming PA.

Table 2.5 Formative and Reflective Decision Rules for PA Construct

changes in the Indicators? Formative -No / Reflective – Yesto produce any effects on the indicator variables. It is more likely that a change in 'place identity' or 'place dependence' will have an effect on their attachment rather the reverse case. c) Would changes in the indicators cause changes in the construct? Formative - Yes / Reflective – Noto produce any effects on the indicators are dopendence' will have an effect on their attachment rather the reverse case. c) This could be discussed controversially but in general, yes. It can be considered a major change of PA when dropping indicators. However, it depends which indicators are dropped as many empirical concepts exists. The two main constructs (Place Identity, Place Dependence) are crucial and dropping one of them is changing PA.2. Are the indicators interchangeable: a. Do the indicators have the same or similar content / share a common theme? (Formative – No / Reflective-Yes)a) In some cases, an overlap may exist, but in general PA indicators do not share a common theme. For instance, 'place dependence' refers to the physical attributes of a place that satisfy tourists needs, while 'place identity' refers to how strong a tourist identifies with the place. Hence, there are distinctive constructs (Gross and Brown, 2006). Similar arguments can be made to the remaining two variables. In this respect, 'social bonding' reflects the social environment of tourists within a place and 'affective attachment' expresses the emotional state towards the place.b. Would dropping one of the indicators be associated with a change in another of the indicatorsa) No, not necessarily the social aspect of PA.c. Covariation (Correlation) between the indicatorsa) No, not necessarily. The indicators are believed to be concep	b) Would changes in the construct cause	b) No. A variation of the PA construct is unlikely
Reflective – YesIt is more likely that a change in 'place identity' or 'place dependence' will have an effect on their attachment rather the reverse case.c) Would changes in the indicators causec) This could be discussed controversially but in general, yes. It can be considered a major change of PA when dropping indicators. However, it depends which indicators are dropped as many empirical concepts exists. The two main constructs (Place Identity, Place Dependence) are crucial and dropping one of them is changing PA.2. Are the indicators interchangeable: a. Do the indicators have the same or similar content / share a common theme? (Formative – No / Reflective-Yes)a) In some cases, an overlap may exist, but in general PA indicators do not share a common theme. PA latent variables don't share a common theme. For instance, 'place dependence' refers to the physical attributes of a place that satisfy tourists needs, while 'place identity' refers to how strong a tourist identifies with the place. Hence, there are distinctive constructs (Gross and Brown, 2006). Similar arguments can be made to the remaining two variables. In this respect, 'social bonding' reflects the social environment of tourists within a place and 'affective attachment' expresses the emotional state towards the place. Formative - Not necessarily / Reflective - Yesa) No, not necessarily the case. For instance, if the physical surrounding are more perceived more meaningful, this would not impact the social aspect of PA.3. Covariation (Correlation) between the indicators a. Should a change in one of the indicators be associated with a change in another of the indicatorsa) No, not necessarily. The indicators are believed to be conceptually different.4. Momological net of the construct indi	changes in the Indicators? Formative -No /	to produce any effects on the indicator variables.
 or 'place dependence' will have an effect on their attachment rather the reverse case. c) Would changes in the indicators cause changes in the construct? Formative - Yes / Reflective - No c) This could be discussed controversially but in general, yes. It can be considered a major change of PA when dropping indicators. However, it depends which indicators are dropped as many empirical concepts exists. The two main constructs (Place Identity, Place Dependence) are crucial and dropping one of them is changing PA. 2. Are the indicators interchangeable: a. Do the indicators have the same or similar content / share a common theme? (Formative - No / Reflective-Yes) a) In some cases, an overlap may exist, but in general PA indicators do not share a common theme? (Formative - No / Reflective-Yes) b) Kould dropping one of the indicators change the conceptual domain of the concept? b) Would dropping one of the indicators change the conceptual domain of the concept? constructs (Caros and Brown, 2006). Similar arguments can be made to the remaining two variables. In this respect, 'social bonding' reflects the social environment of tourists within a place and 'affective attachment' expresses the emotional state towards the place. b) Similar arguments to 1 c) covariation (Correlation) between the indicators be associated with a change in another of the indicators are an social environment of PA. a) No, not necessarily. The indicators are believed to be conceptually different. a) No not necessarily. The indicators are believed to be conceptually different. 	Reflective – Yes	It is more likely that a change in 'place identity'
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Source: Jarvis et al. (2003).

Following the theoretical considerations and the decision-making rules by Jarvis et al. (2003), the justification is provided in table 2.4 to measure PA as a formative model. Moreover, PA is measured as a second-order latent variable as shown in the literature (Ramkissoon et al., 2013; Loureiro, 2014). Following this study context, the empirical measurement follows van Riper et al. (2019) that applied PA as a three-dimensional construct within an Australian National Park. In particular, PA is measured as a reflective-formative model as valid arguments are provided to follow the reflective-formative type II model (Becker, 2012).

2.8. Application of Place Attachment

PA has been applied to many different fields and thus a diversity of authors from different backgrounds studied PA in different contexts and places (Williams, 2014b). Therefore, the following section provides an overview of PA studies and how PA has been researched in different contexts. This includes PA in an urban setting, spiritual places, tourism and PA as pro-environmental behaviour.

2.8.1. Home, neighbourhood, city

Over the years several studies have measured PA to person-home and neighbourhood including different scales in size and range from a house up to a continent (Riley, 1992; Lewicka 2010; Lewicka, 2011). At the beginning of the 1960s research on PA was focused on the residential areas but did not directly measure the affective person-place bond. However, this has changed in the 1980s (Williams, 2014b). The main research focus of environmental studies is based on neighbourhoods (Hidalgo and Hernández, 2001; Lewicka, 2010b). One explanation why residential areas are the primary focus can be explained for instance that research areas in the field of EP are crowding, personal space, territoriality and urbanisation including physical and social environment (Cassidy, 1997). Thus, research focuses for instance on community attachment, involving factors such as housing qualities, ownership, social contacts as well as the length of residence and life-cycle stage. The overall aim is usually community sentiment where community attachment is part of it (Hummon, 1992). Attachment to the community includes not merely the neighbourhood but also relates to a city or town (Mihayalov and Douglas, 2014). Recent studies explored how strong the attachment between neighbourhoods, municipalities and cities is and found the highest attachments to neighbourhoods (e.g. Westin, 2016). On the contrary, a study

by Hidalgo and Hernández (2001) found a weak attachment of neighbourhood compared to home and city. Moreover, nation attachment is also examined as a symbolic relationship between people and their homeland (Ferenczi and Marshall, 2013).

The concept of home was seen as static where people stayed their entire life in one place and can be related to rootedness (Relph, 1976). However, the world has changed and moving between different places is part of everyday life experience (Gustafson, 2014). For example, long-distance travel to work or tourist destinations is common. This increased mobility relates to issues such as attachment to places or detachment due to the development of uprootedness. Furthermore, to be at home and develop social and emotional bonds might provide places with less meaning and thus people are less attached to them. Moreover, migration is also an important aspect. All these kinds of motilities driven by globalization can create interconnectedness between places (Gustafson, 2009; Gustafson 2014). Furthermore, mobility through media such as the internet, phone calls, emails etc. Thus, research mainly focused on home and one place in the age of mobility people might develop and stable attachments to various places (Gustafson, 2014).

2.8.2. Sacred places

Spirituality can play an active role in PA formation (Cross, 2015). For instance, landscape changes and shapes are affected by religious aspects. It was believed in the past that natural settings had spiritual elements such as different gods of the sea, mountains and so on (Ittelson et al., 1974). Thus, sacred places can be categorised into several types. For instance, an attachment might be established to holy natural landscapes, sacred cities and religious architecture or home. This can include sacralised trees or mountains as well as cities such as Jerusalem. Other places might include temples, churches and other sacred buildings (Mazumdar and Mazumdar, 1993; Mazumdar and Mazumdar, 2004). Religion can play an important aspect in people's lives and influence lifestyle such as food, homes, neighbourhoods etc. The attachment to sacred places can be established individually but the collective aspect is also important such as collective praying in a shrine and therefore religion might serve as the symbolic meaning given by religious people (Mazumdar and Mazumdar,

2004). However, the source of personal sacred places is coming from childhood, from the natural and outdoor settings. Further from express one's identity and the link to home as well as rituals of movement and hand-made places (Hester, 2014). Such movements can refer to pilgrimage to a sacred place. It refers to a deep desire to visit that place for an intense experience. Furthermore, pilgrimage to a place can relate to the physical attachment of a person. But in a church or a temple, individuals as well as groups might find a place where a relationship with God can be established and thus a cross can refer to a symbolic attachment (Low, 1992).

2.8.3. Tourism

The degree of PA has been measured with variables such as satisfaction, length of residence or memorable events etc. and thus examines the long-term relationship between a person and a place. In a tourism context, this is difficult because tourists stay a few days at the destination and have a short-term relationship to the place (Chen et al., 2014). As a result, Chen et al. (2014) extended the PA concept by two additional dimensions, namely place memory and place expectation. They developed the dimension based on the work from Milligan (1998), describing two linked interaction processes referring to the past and the future.

The first process, referring to the past, is built by experiences. For instance, a place becomes meaningful for a person through meaningful activities at the site. Over time this experience transfers into memories. At the same time, the second process forms expectations about what will happen at that place in the future (Milligan, 1998). Place memory refers to the short-term interaction and place expectation refers to the long-term process between a tourist and a place. The bond to the place occurs through meaningful experience (Chen et al., 2014). PA in tourism is also referred to as destination attachment but many authors using PA in the context of tourism. However, as shown in figure 2.7, an overview of the different characteristics between place and destination attachment is provided (Chubchuwong and Speece, 2016).



Figure 2.7 Relationship between Place Attachment and Destination attachment Source: Chubchuwong and Speece (2016).

Destination attachment indicates that the emotional link is established between a tourist and a tourist destination (Yuksel et al., 2010). Several studies examined how PA can tie tourists to the destination. For example, Lee and Shen (2013) examined a positive relationship between PA and destination loyalty with recreationists walking their dogs in the park. A recent study by Stylos et al. (2017) explored PA among British and Russian tourists and found that tourists with higher PA are less affected by cognitive and affective images about the destination because they are emotionally tied to the destination. Another study by Halpenny et al. (2016) found that park attachment directly affected loyalty, while event attachment has an indirect effect. Therefore, PA has been combined with concepts such as satisfaction and loyalty (Morais and Lin, 2010; Yuksel et al., 2010; Veasna et al., 2013). PA also applies to tourists and non-visited places. This pre-bonding or early-stage bonding might occur through memories and experiences formed from other similar places possessing familiar landscape characteristics (Cheng and Kuo, 2015). Further PA studies in different tourist contexts

involve for instance natural and national parks (Kyle et al., 2004b; Halpenny, 2010; Ramkissoon et al., 2012; van Riper at al., 2019) at lakeshore or coastal areas (Jorgensen & Stedman, 2006; Tonge et al., 2015) or on islands (Ramkissoon, 2015).

2.8.4. Place Attachment and Pro-Environmental Behaviour

People's connection with places can change the behaviour towards and within a place. Based on the variety of applications, studies examined different outcomes. For example, pro-environmental behaviour and sustainability are found. It is important to have an understanding of what could influence tourist's sustainable behaviour at the destination as well as after their trip (Harmon, 2015). Pro-environmental behaviour can be defined as a behaviour leading to minimise harm or help nature (Steg and Vlek, 2009). This might include direct involvement of people in nature, however, it might also relate to different policies or product prices which in turn have a positive impact on the environment (Stern, 2000). Moreover, Carrus et al. (2014) stated individuals might show pro-environmentally behaviour if they are motivated. The reason for that behaviour is derived from the theory of mother-child attachment, where a positive bond results in positive and caring behaviour. Consequently, an affective bond between a person and a place leads to protective behaviour. Another reason could be to establish well-being within a community (Carrus et al., 2014). Several authors found a relationship between PA and pro-environmental behaviour. For example, Vaske & Kobrin (2001) found that PA increases environmentally responsible behaviour such as water conservation and get awareness about environmental concerns. Further, Scannell & Gifford (2010b) distinguished between civic and nature attachment, where the latter was found to be a significant predictor for self-reported pro-environmental behaviour. Cheng & Wu (2015) investigated environmental sensitivity through increase knowledge about the environment and its effect on PA and in turn its direct effect on environmentally responsible behaviour. Thus, they propose to increase a destination's knowledge and sensitivity towards the tourist destination.

Moreover, Ramkissoon et.al. (2013) found a positive relationship between PA and place satisfaction and further explored PA about low and high effort pro-environmental behaviour intentions. They discovered that the place-affect dimension is a significant factor for low and high effort. Furthermore, according to Stedman (2002), a high attachment leads to the protective behaviour of property owners. Placing pro-

environmental behaviour in a community context people might protect, preserve or defend their neighbourhood (Mihayalov and Douglas, 2014). However, it is also argued that the relationship is not clear, and studies have focused on measuring the behavioural intention rather than the actual behaviour (Scannell & Gifford, 2010b). According to Halpenny (2010), few studies have examined the relationship between showing pro-environmental behaviour and intention. Overall, the main aim of exploring PA in the tourism context is to understand people's behaviour, attitudes, beliefs and how they link to destinations. Further, the key aspect of using PA theory is to examine the behaviour of tourists in terms of their emotional, symbolic and intangible meanings to places (Harmon, 2015).

2.9. The critical approach of Place Attachment

As outlined before, a variety of research disciplines contribute to PA theory. In this sense, many studies show a different approach and may differ from other research areas. Therefore, it is important to demonstrate what key issues are identified when exploring PA from a different research discipline. In this sense, different methodological and theoretical concepts are applied to add new knowledge to PA theory. However, it might be difficult to evaluate new knowledge and empirical concepts as research communities have a different approach to science. Hence, this may lead to certain issues that will be further discussed.

One major critic in PA research is the lack of developmental theory (Giuliani, 2003; Morgan, 2010; Lewicka 2011). For instance, attachment theory has evolved and provides a more developed theory in terms of biological, psychological and social processes. On the other hand, it is criticised that research in place lacks in providing a systematic explanation of how the complex structure between, place, identity, affect and cognition develops in childhood. One reason might be no interrelationship and the lack of referencing between developmental and EP. Further, it is argued that studies have focused merely on adults of social construction studies. Furthermore, interaction with the environment is seen by attachment theorists as only important in social interactions, while the place is seen as a passive stimulation (Morgan, 2010).

Besides the lack of theory also empirically aspects are neglected despite the considerable number of people-place studies. Moreover, this is a known problem due

to establishing one concept from the great variety of terms available. However, many researchers solely acknowledge and confirm this circumstance (Hernández et al. 2014). Furthermore, the concept of SoP is unclear as well (Kaltenborn, 1998). For instance, Low and Altman (1992) argued that PA subsumes or is subsumed by a variety of equivalent concepts such as Topophilia (Tuan, 1974), place identity (Proshanksy et. al., 1983), insideness (Rowles, 1980), genres of place (Hufford, 1992), SoP or rootedness (Chawla, 1992), environmental embeddedness, community sentiment and identity (Hummon, 1992). This statement is claimed to be '...a remarkably vague articulation of PA relative to other terms' and to 'lack of construct clarity' (Stedman, 2003, p. 824).

Despite that several authors claimed that PA and SoP lack developmental theory, Patterson and Williams (2005) argued that these critiques are overstated and identified three reasons. Firstly, concepts and definitions are viewed too narrowly and thus not considering the 'big picture' of place research. Secondly, lack of distinguishing between different research programs and lastly, misunderstand the place theory as a unified research field. Thus, different ontological and epistemological viewpoints exist. Therefore, a great variety of different methods is based on two aspects that affect research on PA. Firstly, place as a locus of attachment aimed to quantify the strength of the emotional bond. The second aspect sees the place as a centre of meaning and considers a holistic view of place investigating experience, meanings as well as social and cultural processes. Thus, research on PA is divided by quantitative or qualitative research methods (Williamson, 2014a). However, the majority of studies can be found in quantitative methods (Lewicka, 2011). Quantitative methods vary in content and characteristics in using different items. However, Likert-type scales dominate but lacking in providing a unified measurement tool. Thus, because of the aim, size and range comparison of results is difficult. Consequently, reliability and validity problems are present because of the different scales used in the literature, Moreover, these scales aiming to measure the same (PA) but emphasizes different aspects in terms of behavioural, attitudes and beliefs. Another problem is that emotional bond is intended to measure but scale items relate to other dimensions. Therefore, the authors suggest that new scales have to be justified instead of applied ones and using multivariate and structural equation modelling to establish a relationship between variables. Qualitative studies usually in geography and anthropology applied are using interviews. The mixed-method approach would allow different disciplines to contribute to PA (Hernàndez et al., 2014). Thus, three main critics can be identified from the literature. Firstly, lack of PA developmental theory, different ontological and epistemological strands and heterogenic measurement scales aiming to measure the same.

2.10. Summary

This chapter presented key place definitions and introduced also virtual aspects of places. In this respect, some different approaches were introduced on how people perceive and interact with places. This included also what meaning and values may be linked to environments. Further, attachment theory was discussed aiming to provide the theoretical development of PA. In this sense, definitions of PA were analysed, and a new definition was proposed. Moreover, the conceptual framework identified the key aspects of PA theory while the empirical concepts presented the main constructs of PA. In addition, a range of applications was demonstrated explaining the importance of PA in each context. In the end, a few critical aspects were presented as many research disciplines contribute to PA theory.

Further, based on the literature review of this chapter some key themes were identified. For instance, place perception as epistemological process by humans. In this line, perceptions of humans are key how a place is interpreted and understood. Consequently, places can have different meanings for individuals. These meanings may also include how virtual places are perceived, but literature on place research lack of extant place definitions by identifying the importance of virtuality. A further theme identified relates to the complex concept of defining and measuring PA. It is evident that PA theory describes a variety of humans' intrinsic needs to form bonds to places. These needs are expressed in psychological aspects of identity, satisfaction of commodities as part of place consumption or by a social aspect of interacting with others. Regarding measuring PA, empirical measurements vary through its multivariate empirical concepts but also by its theoretical approach which informs the empirical approach. Hence, the complexity and diversity of PA theory is a result of research traditions and subsequently, these differences are rooted in their ontological and epistemological foundations.
Chapter 3 - Virtual Reality (VR)

3.1. Introduction

Tourists have the ability to access VE and different places instantaneous by using a variety of media types such as in written form, visually and also aurally (Harmon, 2015). Hence, they can keep in touch with their favourite destination. However, PA studies refer to places as a physical and social environment. The question about virtual places is not considered. While technology enables travelling to virtual environments research within PA in virtual settings has been neglected (Gustafson, 2014). A recent study by Oleksy and Wnuk (2017) examined the effect of augmented reality technology on PA by exploring the effect of the AR gaming experience. The results show positive relationships between the game satisfaction and social interaction between players made at the location generate positive feelings towards the place, which in turn might lead to attachment. However, in a VR context, PA has not been applied. This can also be confirmed as a general observation that AR and VR studies are very limited in tourism studies.

VR is to understand as a medium representing a world where people experience places, objects and other people. For instance, a social virtual world, such as Second Life, is a world, built and owned by users, where people can interact (Saunders et al., 2011). The medium and its information can be stored in several media such as computers, books, videos or the human brain and can be retrieved by its access point called interface (Sherman and Craig, 2003). Moreover, VR is expected to grow in the next years accompanied by large investments and is applied in many different fields such as education, medicine, geography or advertising (Martín-Gutiérrez et al., 2017). Such medium is also for example provided by Oculus Rift (2017) which has recently launched its VR product, providing a head-mounted display (HMD) for the visual part, a controller to track the input of the user and headphones for the sound. Thus, allowing communicating and retrieving information through VR technology.

3.2. Immersive Technologies

Immersive technologies have been drawn much attention in recent years showing various implications for businesses, especially in tourism (Beck et al., 2019). In this sense, a new experience of interacting between the physical and the virtual world is provided through immersive technologies such as VR, augmented reality (AR), and

Mixed Reality (MR) (Flavián et al., 2019). In particular, immersive technologies may influence the relationship between stakeholders and customers by adding value to the experience at all touchpoints of a customer journey (tom Dieck and Han, 2021). Hence, immersive technologies can provide an experience at all transactions between companies and consumers and be part of the pre-purchase, purchase and post-purchase, or as we would call it in tourism, the pre, during and post-travel experience. Consequently, this also includes destinations and tourists and thus, the overall tourist experience (Bec at al., 2021; tom Dieck and Jung, 2017; tom Dieck et al., 2018; Tussyadiah et al., 2018).

However, to describe the application of immersive technologies various authors have used a range of stages placing each technology along a continuum. For instance, and probably the most used example refers to the Reality-Virtuality Continuum (RVC) by Milgram et al. (1994) as shown in figure 3.1.



Figure 3.1 Reality-Virtuality Continuum Source: Milgram et al. (1994).

VR can be seen as the counterpart of the real environment. In between, AR and Augmented Virtuality (AV) are positioned as part of the MR experiences. However, more recently, Flavián et al. (2019) proposed a more refined version of the reality-virtuality continuum where MR is considered as an independent type of reality coexisting besides AR and AV as shown in figure 3.2.



Figure 3.2 Refined Version of the Reality-Virtuality Continuum Source: Flavián et al. (2019).

For the tourism industry, the most important immersive technologies that have evolved in the last years are AR and VR (Yung and Lattimore, 2019; Loureiro et al., 2020). Especially, immersive technologies are firstly applied to enhance the on-site tourist experience (van Nuenen and Scarles, 2021). Therefore, this study will briefly explain the differences between these technologies as they are important for the digital tourist experience. In this respect, AR as one of the immersive technologies can be described as seeing the real world with mixed or overlaid virtual objects. Thus, it is completing the real world instead of replacing it and exists in the same environment preferably (Azuma, 1997). Hence, the consumer's experience is placed within the real environment in real-time but enhanced virtually (tom Dieck and Jung, 2018; Rauschnabel, 2021). This augmented experience can be provided through AR Glasses, smartphones, or virtual mirrors (Rauschnabel et al., 2019). Furthermore, AR applications on smartphones can provide various tourist information and increase the overall experience (tom Dieck and Jung, 2018). Several studies showed that place exploration can be stimulated through AR. For instance, Zack and Tussyadiah (2017), found that users of Pokémon Go, an interactive AR game, were willing to travel to places to play the game. This included day trips and overnight stays at the destination. Moreover, according to Chung et al. (2015), AR experience increased visitors' knowledge while being on a heritage site leading to a positive tourist experience. Similar studies, such as Oleksy and Wnuk (2017), found AR gamification as a suitable device for visitors to engage with a destination. In particular, visitors explore new areas

and gain new knowledge about places as part of their gamification experience. In this sense, individuals enhance their experience of their surroundings and, therefore, the focus of the AR experience extent the reality by adding virtual information as a digital overlay.

On the other hand, VR is the complete replacement of the real environment providing an immersive experience where individuals can look around by moving their heads (Hu et al., 2021). This can provide various benefits for tourists to enhance the on-site experience as VR can be applied in many different ways such as in marketing, accessibility, or educational purposes (Guttentag, 2010). In this sense, VR enhanced the tourist experience in museums, theme parks, sports events and also National Parks (tom Dieck et al., 2018). Similar to this study, the focus lies on exploring a National Park virtually as part of the overall tourist experience. Especially, as PA theory evaluates all place experiences, tourists' experiences may have taken place in many different locations. VR applications allow creating any place experience that can be viewed from multiple perspectives. This allows a novel and innovative way to consume existing places. Therefore, the ability to reproduce a holistic place experience in VR, an immersive VR experience seemed more appropriate. In contrast, the AR experience needs the physical environment and therefore, exploring the AR experience is place dependent and therefore, can solely capture that specific place-based experience at the destination.

3.3. Defining Virtual Reality

However, when defining VR, the literature offers several definitions of what is meant by VR and thus, might be confusing (Hedberg and Alexander, 1994). Therefore, it is argued that clear definitions are needed to direct academic research and its application (Schroeder, 2008). Following table 3.1 VR definitions are presented.

Author		Definition
1)	Steuer (1992, p. 76 pp).	"A virtual reality is defined as a real or simulated environment in which a perceiver experiences telepresence".
2)	Gigante (1993)	"The illusion of participation <i>in</i> a synthetic environment rather than external observation of such an environment. VR relies on three- dimensional (3D), stereoscopic, headtracked displays, hand/body tracking and binaural sound. VR is an immersive, multisensory experience".
3)	Schroeder (1998, p. 25)	"A computer-generated display that allows or compels the user (or users) to have a sense of being present in an environment other than the one they are actually in, and to interact with that environment".
4)	Styliani et al. (2009, p. 522)	"A simulation or a real or imaginary environment generated in 3D by digital technologies that is experienced visually and provided the illusion of reality".
5)	Guttentag (2010, p. 638)	"The use of a computer-generated 3D environment – called a 'virtual environment' – that one can navigate and possibly interact with, resulting in real-time simulation of one or more of the user's five senses".
6)	Martín-Gutiérrez et al. (2017, p. 473)	"The concept of Virtual Reality (VR) refers to a whole simulated reality, which is built with computer systems by using digital formats. Build and visualizing this alternative reality requires hardware and software powerful enough to create a realistic immersive experience"

Table 3.1 Various definitions of VR

The definitions describe VR in different ways. Several definitions are more specific in technological details while a few are less specific. For instance, VR can be either generated or a reflection of the real world. Moreover, definitions include sensory experience entirely, partially or are missing. However, according to Steuer (1992), technical terms might be useful for VR technology producers. But, from a consumer perspective, the key aspect of VR is the human experience. In this line, telepresence has been coined, which can be defined as the made media experience of "being there" or "somewhere else". It is a mediated perception of a real or virtual environment. Additionally, by applying the concept of telepresence a VR definition does not require any reference to hardware components (Steuer, 1992). Furthermore, the sensory experience is the key aspect of VR and any definition without point it out becomes insignificant (Schroeder, 2008). Based on the definitions in table 1 VR "can be defined as an immersive human experience within a virtual environment either artificial generated or a realistic representation of a place experienced by the user's senses." (Pantelidis, 2019, p.384).

3.4. History of VR

The term VR has been coined by Jaron Lanier at the end of the 1990s (Ryan, 2015). Consequently, VR is not a new technology (Chan, 2014) considering VR technology gadgets launched to the mass market. However, the first kind of VR has its historical roots in 1838 where Charles Wheatstone created the stereoscope and firstly allowed people to experience a sense of depth and immersion. Later on, in 1939 William Gruber's View-Master was used for "virtual tourism" showing different postcard images in 3D.



Figure 3.3 View-Master 3D Source: View-Master (2016)

Further developments were made by Morton Heilig creating a device called Sensorama presenting theatre movies in 1955. This device provided a personal multisensory experience including visual, aural, olfactory and haptic experiences (Virtual Reality Society, 2017).



Figure 3.4 Sensorama Source: Heilig, M. (1960) 'Sensorama.' Medienkunstnetz.de.

Unlike the personal experience, the shared experience was possible with CAVE (Automatic Virtual Environment) where people stand in a dark room surrounded by screens and thus feel some kind of immersion. One of the first HMD was patented in 1960 providing stereoscopic view and sound. Devices such as in figure 3.5 were the models of the current VR HMD (Virtual Reality Society, 2017).



Figure 3.5 First HMD Source: Virtual Reality Society (2017)

Since the early development of VR in the 1990's several attempts were made to offer a VR experience for the customer but remained at the prototype phase due to technical difficulties. Especially the video gaming industry enabled public access to these devices. This however did not succeed for a long time and it remained in a prototype stage. Nevertheless, almost 20 years later, 2016 is considered a key year for VR technologies as it was expected back in the 1990s (Virtual Reality Society, 2017).

Although there was a general hype in the 1990s, the VR revolution did not happen. In that time a stronger focus lied on theoretical consideration of VR applications which is easier to predict than realistic and practical implications (Williams and Hobson, 1995). Consequently, theoretical VR applications were formulated as well as their negative and positive aspects. In this sense, considerations about VR technology were made such as to replace reality, use VR instead of drugs or do other things without taking a risk. VR was seen as a technology to increase someone's mind leading to new powers and thus might become addictive (Ryan, 2015).

3.4.1. Requirement for using VR

There are three types of VR technology that can be used to experience VR. Firstly, the dedicated HMD, secondly Smartphones where can be mounted on headsets (Martín-

Gutiérrez et al., 2017) and lastly, the standalone VR headset. The dedicated HMD needs a stationary personal computer or a gaming console. Figure 3.6 shows the dedicated HMD from Oculus Rift with integrated headphones and separated hand controllers (Oculus, 2017). A similar design is also the standalone option such as Oculus Quest 2 (Oculus, 2021) where the personal computer is integrated into the headset and does not need any external devices. On the other hand, considering Smartphone devices for VR such as Samsung VR Gear requires solely a Smartphone and its headset as presented in figure 3.7. The HMD need a Samsung's mobile phone which serves as the visual component. The Smartphone's speakers are responsible for the aural experience and the controller presents the haptic element. This option and the standalone VR device allows the user to be mobile and therefore, VR can be experienced everywhere (Oculus, 2017). Importantly, the generation of Smartphone's will include applications to make it easier to view and share 360° videos (Martín-Gutiérrez et al., 2017). For all devices visual, sound and haptic experiences are possible.



Figure 3.6 Samsung VR Gear Source: Oculus (2017)



Figure 3.7 Oculus VR Gear Source: Oculus (2017)





3.5. VR Experience

Researching VR experience has become an important aspect in recent years through the emerging VR market (Cheng et al., 2014). The reason might be that VR can create a real-life situation that is economical, ethical or difficult to apply in a real environment (Søraker, 2014). However, to provide these experiences, VR uses computers to create 3D environments and simulate reality (Martín-Gutiérrez et al. 2008). According to Parisi (2015, p.9), "virtual reality has one goal: to convince you that you are somewhere else". This can be achieved by tricking part of the human brain's visual cortex and perceive motions by using technology – melting of reality and fantasy. This is possible with technologies such as Stereoscopic devices, Motion Tracking Hardware, input devices, Desktop and mobile platforms. These components are needed to achieve a fully immersive virtual reality experience (Parisi, 2015). According to Lee et al. (2004), a real experience can be defined as the sensory experience of actual objects. A virtual experience can be described as a sensory or non-sensory experience of para-authentic or artificial objects as figure 3.8 shows:



Figure 3.8: Characteristics of VR Experience Source: Lee et al. (2004)

Lee et al. (2004) distinguished between para-authentic and artificial VR experience comparing it to a context of the physical, social and the self. The main difference between these two concepts is the degree of reality included within VR. In this sense, the personal VR experience is related to the real physical environment which can be represented by a real person and the self. The artificial experience refers to an entity that simulates these aspects and serves as a proxy between the personal experience and the VR experience. The VR experience is, according to Martín-Gutiérrez et al. (2017), mainly addressed to video game users and thus people may be unaware or does not see a meaningful purposive of what this technology offers. Therefore, it is important to create content to increase the popularity of VR technology which may have an informative, educational or professional characteristic.

However, VR has expanded its popularity in the tourism sector showing to possess high potential to enhance the tourist experience before travelling to the destination. Therefore, VR can be used as a promotional device for tourism destinations or to provide complementary experiences at the destination. This can lead to behavioural intention such as recommend the destination to others or express their intention to visit it (Jung et al., 2017a; Jung et al., 2017b). Thereby, VR experience a priori increase the interest in visiting the destination. However, a stronger result could be achieved if the VR application is perceived as aesthetic and allow a flow of VR experiences. Thus, distractions should be avoided (Tussyadiah et al., 2016). A recent study has shown that VR possesses great potential compared to websites or 2D videos to create positive emotions towards a destination. Especially, looking and sharing information about the destination shows a more significant decision process of potential tourists (Griffin et al., 2017).

Moreover, the experiences stimulated in virtual worlds and thus represented in VR are similar to experiences in the real world (Kim et al., 2017b; Goel et al., 2011; Benyon et al., 2006; Søraker, 2014). These experiences can affect behaviour after the VR experience (Fox et al., 2009a; Søraker, 2012). To reach an optimal experience, all senses are needed but the majority of VR applications offer a visual and aural experience. However, involving all senses in a VR environment is difficult. Reasons for that involve the customisation of experience, the synchronicity of input and scalability (Martins et al., 2017).

A recent study shows the effect of VR on providing positive experiences such as positive attitudes, satisfaction and customer loyalty intention. Positive outcomes were found by retail customers in a shopping mall when perceived as very crowded (Van Kerrebroeck et al., 2017a). Another study found positive VR experiences made by virtual golf users by placing importance on the social VR experience rather than the physical presence (Lee et al., 2013). However, VR consists of several dimensions. Rosenbaum and Cross (1997) argued that VR is related to three dimensions of immersion, interaction and visual realism. Moreover, also four key elements of VR experience are identified according to Sherman and Craig (2003) namely, virtual world, immersion, sensory feedback and interactivity and are described below.

3.5.1. Virtual World

A definition of places in virtual environments is given by Goel et al. (2011, p. 751) and is defined as "a mediated space that evolves from users' sensory perceptions, awareness, and the meaningful interactions that can occur in the VW [Virtual Worlds] ". The users' experiences are attached to that place. "Virtual world" is an imaginary world established through a medium and is a description of objects within a simulation. It can be serving as a social space where people interact with other people (Schroeder, 2008). In this simulation, the rules of behaviour may be programmed or unreal, simplistic or complex (Sherman and Craig, 2003). The first virtual worlds were textbased and developed into three-dimensional worlds including animations and allowing communicating between users and thus overcoming spatial distances between people (Partala, 2011). Further developments enabled animating visually complex physical spaces such as creativity-based environments, for example, Second Life or massively multiplayer online role-playing game such as World of Warcraft populated by millions of players. Consequently, VW is not solely a marginal phenomenon, but rather part of society (Bainbridge, 2007). For instance, Second Life (Linden Lab, 2017) allows the user to explore different places by creating their avatar and navigate through the world. Moreover, it is possible to do business such as selling and buying things for their avatar by spending virtual and real money within a virtual economy (Guo and Barnes, 2011). It also provides the possibility to create landscapes including natural sites such as forests or built sites such as cities (Clark, 2016). Thus, these environments provide information, features, structure and access to users that would not be available at that place and time focusing on human perceptions and sensory by extending the visual

information into a three-dimensional space. However, to differ from a cinematic image, VE should offer more than solely an image. To achieve a 'natural' perception of the environment the physical objects should simulate the realistic behaviour of people's experience. This includes seeing the environment in-depth and providing some kind of interaction such as navigation or exploration (Wann and Mon-Williams, 1996).

3.5.2. Immersion

VR application's purpose is to deliver an immersive experience (Kim et al., 2017a). According to Morie (1994) "Immersion" is one of the main aspects of VR and a VE with sensory experience such as smell, sound, touch and visual will strengthen the immersion compared to a single sensory experience. Furthermore, the development of the technology providing better images may enhance the immersion. Moreover, qualitative aspects of a higher immersion could affect more subtly or increase the aesthetic and thus a simulation might become more alive (Morie, 1994). In addition, according to Ryan (2015), immersion affects the degree of an environment's authenticity as well as the different activities performed by its users. However, the most important aspect involves the degree of people's willingness to believe in what they see through the mediated experience (Morie, 1994). Furthermore, immersive experience allows people to have a first-person experience (Gutiérrez, 2017). This experience is made within another reality meaning that this reality might be a representation of the same or a fantasy place and thus enables one to perceive a different place compared to someone's real environment (Sherman and Craig, 2003). Reviewing the progress of VR systems made in the last 25 years, immersion was solely referring to as a computer-simulated world. However, streams of 360° videos are also part of VR and thus both technologies provide realistic virtual environments including real and fantasy worlds (Loomis, 2016).

"Immersion" represents the physical part of the VR experience and can be divided into full immersion (Head Mounted Display – HMD), semi-immersion (large projection screens) and non-immersive (Desktop-based) (Gutiérrez et al., 2008). Especially the HMD is argued to be critical according to Morie (2006) to exclude the real world providing a fully immersive experience. Besides the physical immersion, it is also argued that VR offers a psychological and motivational immersion. Psychological immersion includes the aspects that cannot be represented physical such as intangible elements. For instance, solving an equation happens in the user's mind which cannot be placed physically. Motivational immersion involves the user's challenge provided such as in a computer game. In this context, the degree of realism of the representation is not important (Hedberg and Alexander, 1994). According to Slater and Wilbur (1997) immersion refers also to the technological aspect of a VR system and involves several aspects such as inclusive, extensive, surrounding and vivid. Inclusive refers to the extent of how present the real world is, while extensive describes the availability of various sensorial experiences. Surrounding relates to the user's field of view and vivid describes the quality of the visual component of the VR. This includes, for instance, the resolution, fidelity, content or quality of displays etc.

3.5.3. The Concept of Presence

The concept of presence is an important psychological concept to understand the relationship between people and computers (Makransky et al., 2019). The reason why VR is popular among researchers and practitioners is that of presence (Loomis, 2016). In the literature the concept of presence is ambiguous and for some authors, presence is closely linked to immersion. For example, mental immersion can be used as a synonym for presence to describe as being intensely involved or in a state of suspension of disbelief (Sherman and Craig, 2003). Furthermore, according to Morie (2006) presence, immersion and engagement are used to describe the same phenomenon in VR. However, several studies distinguish between immersion and presence (Slater and Usoh, 1993; Slater and Wilbur, 1997; Baños et al., 2004). Unlike immersion, these studies describe presence as linked to the subjective experience of the person (Slater, 1999, Slater and Wilbur, 1997). Presence can be defined as 'being there' (Steuerman, 1992). This 'being there' can be for instance in a realistic virtual world (Loomis, 2016) and thus presence may enable users to experience feelings in VE as in real ones (Fox et al., 2009a).

According to Lee (2004) synonyms for presence exist such as telepresence, a virtual presence or mediated presence and can be divided into three types of presence, namely a physical, social and self-presence. The first one occurs when the user does not notice the VE. Social presence occurs when the user does not feel the virtual simulated social interaction such as reading a letter or listening to a voice and does not necessarily involve a second person to be present, thus it can be a one-way or a

mutual relationship. The third aspect involves self-presence and refers to when the user does not notice their representation about themselves. This incorporates physical activities such as changing views when moving the heads or socially when responding correctly to user's input (Lee, 2004). This classification represents according to Makransky et al. (2017) an important step to create a unified theory that has been lacking so far and existed theoretically. Further, the authors have developed a psychometrically model and confirmed the theoretical multidimensional model of the presence of Lee (2004).

Steuer (1992) distinguished between presence and telepresence. The former relates to the natural perception of experience and the latter refers to the mediated perception of experiences. Thus, telepresence refers to an illusion of being at a distant location and presence involves the feeling of being in a virtual location (Baus and Bouchard, 2017). Further, Steuer (1992) defined telepresence by two aspects, namely vividness and interactivity, where vividness involves the degree of richness of the VE. Moreover, it offers sensorial information and thus is stimulus-driven, whereas interactivity describes the degree of participation and manipulating of the VE in real-time. In this line, vividness can be divided into two aspects, namely in width representing the sensorial stimulation provided concurrently and depth referring to the quality of the sensorial information. A recent study by Van Kerrebroeck et al. (2017b) confirmed a positive correlation between vividness and presence in VR compared to a 2D video. Moreover, this positive relationship leads to a more positive brand attitude and increases purchase intentions. Baus and Bouchard (2017) found that an unpleasant scent leads to a higher presence. On contrary, Serrano et al. (2016) tested the effect on presence by applying touch and olfactory and revealed no statistically significant effect.

Several factors are identified and summarised by Slater et al. (1994) leading to presence; these aspects include the high quality of information to user's senses, consistency of the VE, interaction, representing the user closely to real appearance as well as correct behaviour movements. Moreover, the link between users' actions and effects should be easy to be able to model over time. Besides technological aspects emotions may enhance presence. In this line, positive and negative emotions occurred within a VE affected presence positively (Riva et al., 2007). Further, emotions show to

have an impact on user's engagement and influence the perception in terms of being more natural and realistic compared to neutral VE (Baños et al., 2004). Consequently, VR applications should evoke emotions to increase participant's presence.

However, according to Morie (2006), considering even a high presence people will always be aware of a VR experience. Nevertheless, the importance of presence relates to creating a positive experience in VR.

3.5.4. Sensory Feedback

"Sensory feedback" delivers sensory response based on the position of the person and traces the user's input. Depending on the VR systems different sensory feedback is mostly focused on visual sense but also includes aural or haptic experiences (Sherman and Craig, 2003). However, VR aims to provide an experience from all the senses and thus feedback should include all five human senses (Kim et al., 2017a). Two aspects of input can be distinguished namely user and system generated. The former relates information based on the person's input and thus provide a direct manipulation. The latter refers to the external source and consequently is not depending on human input. Such a source might be a server where real-world data updating the virtual world (Sherman and Craig, 2003). Martín-Gutiérrez et al. (2017) argued that users should get immediate feedback on someone's movement, position and feeling and thus enable people to send and receive commands to a device. These devices may be trackers, gloves, keyboards or other devices able to process user input. For instance, feedback in terms of motions Lee et al. (2017) divided motion into four categories.



Figure 3.9 Type of VR motions Source: Lee et al. (2017)

Hand-based motions include gestures with fingers where the user can hold, push and throw objects. Leg-based motions refer to movement on the ground. Leap motions involve the joint gesture of fingers and hand and represent the hand realistically in VE. Walking and running can be achieved by treadmill-type devices and overcome spatial problems and allows people to move freely. Furthermore, the authors found that virtual walking similar to the user's own walking motions affected VR sickness, immersion and presence positively (Lee et al., 2017). Furthermore, the authors Kim et al. (2017a) tested a haptic sensor distinguishing two types of feedback where the user receives vibration and heat reactions.

3.5.5. Interactivity

The fourth element includes the interactivity responding to user's input and may help to provide authenticity in VR (Sherman & Craig, 2003). Interactivity can be described as the degree of power a user has to participate in altering the form and content in realtime and vary on the type of technology. Moreover, three items are identified; the first one is speed and relates to how fast the input is processed in the VE. The second aspect is the range and involves the amount of different possible actions available at a specific time. The last aspect includes mapping which refers to the way of how the control is organised and connected to the VR system (Steuer, 1992). The interactivity in VR should give users the possibility to alter things when desired and also include positive, negative or neutral consequences. This means people should be able to change things in a VE and to make the world more personal (Morie, 1994). For instance, an HMD allows users to change their head position and thus change the focus of their visual stimulation and this may lead to an enhanced experience which in turn might affect the presence (Fox et al., 2009a). Interactivity may range from very simple such as changing viewport to complex interactivity where the user can actively control and change the VE (Wann and Mon-Williams, 1996). Even though navigation and exploring of the VE might satisfy users a truly interactive environment replies to the user's input (Ryan, 1999).

3.6. Application of VR

Martín-Gutiérrez et al. (2017) showed four key points of advantages using VR. Despite it is referred to the educational context, each point can be transferred or related to tourism. Firstly, VR motivates and engages people as well as enables an immersive

experience. Secondly, VR allows interacting with objects and other people, thus people can explore and communicate with others. Thirdly, VR is affordable and more and more people including people with physical disable can share, interact and access VE. Fourthly, VR enables to experience in such a way it cannot be achieved otherwise. VR has been applied to many different fields such as education, medicine, business arts and entertainment (Yount, 2004; McMenemy and Ferguson, 2007). For instance, VR can help to treat flight anxiety (Cardos, et al., 2017) or help to improve people's movements in the post-stroke rehabilitation phase (Trombetta et al., 2017). Moreover, improvement in the educational process can be achieved by enabling students to increase their understanding and attention as well as interactively present content. Further, experiments can be applied that would be not possible in a real environment (AlAwadhi et al., 2017).

3.6.1. VR in Tourism

As far back as the 1950s, Academic scholars started to think about the implementation of VR and its potential and risks. For instance, Williams and Hobson (1995) identified three broad areas in implementing VR in tourism: Firstly, the creation of virtual theme parks, secondly, applying VR as sales and promotional tool and lastly, creating artificial tourism. (Cheong, 1995) Further, it is argued by Cheong (1995) that VR will enhance tourism and he distinguished between macro and micro levels. The macro-level includes tourism policy and planning and will help destination planners with building the destination. At the micro-level VR could replace brochures and serve as a marketing tool before visiting the destination, inaccessible places, decrease travel costs, reduce the level of stress by staying home and may also avoid physical harm at the destination, etc. (Cheong, 1995). However, in a comprehensive analysis of VR in tourism according to Guttentag (2010), VR can be integrated into planning and management, marketing, education, entertainment, accessibility and heritage preservation.

The application of VR in tourism has mainly be adopted within a tourism marketing context (Yung and Khoo-Lattimore, 2019). The main advantage of using VR refers to the ability to provide an experience and new information at any time and therefore, to receive information about a destination is not anytime time or place dependent (Kang, 2020). In this sense, VR can be used in a different way such as to substitute paper

brochures and thus be part of digital marketing tools such as e-brochures, websites and provide a fully immersive VR experience of products that are close to reality. This, in turn, might be diminishing the uncertainty of tourism products by consumer's who cannot assess the product before its consumption (Cooper and Macneil, 2005; Lee et al., 2020). In this line, Lee et al. (2010) explored the effect of VR on websites and found that VR can strengthen the mental imagery processing of customers when visiting a website. Sensory description of that website evokes mental imagery which leads to a virtual presence of the users and thus provides a quasi-trial experience of the destination (Lee et al., 2010). Moreover, VR might be seen as an innovative product delivering information as well as allow users to interact and explore unknown destinations. Thus, motivate potential tourists to go to the site and reducing the perceived risk of travelling thereby letting them take a virtual tour a priori (Pantano and Servidio, 2011). In a recent study, VR has been compared to 2D images and Web pages and found that VR possesses great potential to engage tourists effectively and influence behavioural intentions (Griffin et al., 2017). Since VR provides full immersion with a sense of a real experience this may lead to a greater extent of telepresence and could replace current marketing web tools. Hereby, promoting a destination or even create e-brands through virtual communities, VR could communicate information but also transfer emotions of a destination's values (Kavoura and Bitsani, 2013). Further, web-mediated information also affects higher telepresence and helps in the virtual destination image process. Thus, telepresence influences the virtual cognitive image of a destination which in turn leads to a virtual affective image and finally impacts the virtual conation such as booking holidays products online. In this context, telepresence act as a mediator between the provided information and the virtual image process (Hyun and O'Keefe, 2012). However, according to Yeh et al. (2017) VR images compared to 2D images tourists need to be emotionally engaged to enhance the tourist's emotion through VR significantly.

Besides the destination's website also software simulating VR worlds such as Second Life (SL) allows to build and share virtual destinations with users (Lab, 2021). For instance, Huang et al. (2013) researched the acceptance of a virtual destination in combination with hedonic elements such as enjoyment and positive emotions. They found that if tourists can easily use these technologies (e.g. navigate easy) and perceive the technology as useful, the hedonic experience is affected positively which

leads to positive behavioural actions such as travel intention and higher interest in that destination (Huang et al., 2013). Further, according to Pantano and Corvello (2014), virtual tours provide an innovative way to influence tourists' destination choices positively. Another recent study by Huang et al. (2016) indicated the important psychological aspects in VR such as relatedness and autonomy to enhance the consumer experience and behavioural intention. In addition, Lee et al. (2020) developed a VR quality framework measuring content quality, system quality and vividness impacting the behavioural intention to visit the tourist destination in VR. In their study, tourists were able to explore the destination of Santa Clara virtually and visiting several locations such as hotels or attractions and receiving important information.

An additional aspect of marketing involves the possibility to address new target groups and markets. Therefore, another advantage of using VR in marketing might satisfy tourists who cannot afford to travel to the destination. Rather, they are solely wished to consume the history of the site and not interested in visiting the remaining heritage site. Thus, VR could substitute documentaries or books about past cultures and rather recreate the different stages with a virtual tour guide (Cooper and ManNeil, 2005). Moreover, pilgrimages through VR technology can encourage the spiritual experience of religious places (Hill-Smith, 2011). Furthermore, theme parks may use VR to combine with existing attractions such as roller coasters to provide a novice customer experience. For example, the velocity of the rollercoaster matches with the VR environment and give customers the feel of flying through space (Jung et al., 2018). Also, experiencing a National Park in VR allows tourists to look at the place from different angles that might enhance the tourist experience and motivation to travel. This can be either applied in the pre-travel stage to attract new markets or be part of the on-site experience (tom Dieck et al., 2018). Similar findings are supported by (Marasco et al., 2018), as VR impacts the intention to visit a tourist destination.

Additionally, VR also allows handicapped people to experience activities they were not able to do before. For instance, VR improved the well-being as well as the reaction time of physically disabled people after exercising VR games (Singh et al., 2017). In a tourism context, for people who are not physically able to experience certain touristic activities, VR might motivate them to travel to these destinations and thus VR substitute the real experience. In this respect, climbing mount Everest can be accessed with VR (Everest VR Virtual Reality, 2021) allowing for an experience that is usually not achievable for the average tourist. Furthermore, VR may also provide customers with the possibility to create a personal souvenir of their holiday experience involving tourists to co-create their experience. This led to a positive outcome such as revisit intention and positive word of mouth (Jung and tom Dieck, 2017). Hence, a variety of examples demonstrate the multiple ways in which VR can enhance the tourist experience at all stages of the tourist consumption process. This includes promoting a tourist destination before visiting the place but also at the destination level. This allows DMO's to rethink their marketing strategy and enables them to target new potential customers.

3.6.2. Alternative Research Design

VE and even video games allow different disciplines of researchers to apply an alternative research design (Bainbridge, 2007). The reason for applying VR in social science, for instance, is according to Fox et al. (2009b) threefold; Firstly, exploring similarities and differences between real and virtual environments. Secondly, research in VE may be used to prepare for real-world applications. Lastly, VR can be applied to extend and repeat experiments within a controlled environment and can substitute expensive real-world experiments. For example, Bishop and Gimblett (2000) used VR as an alternative way of researching to explore tourists' behaviour to gather information about their behavioural patterns. The VE represented the site and visitors' path choices were tested as well as objects that may influence their decisions. This allows destinations to know, plan and manage movement patterns of tourists more effectively and may lead to developing alternative strategies to preserve sensitive tourist attractions. Furthermore, it may also be less time consuming compared to a classical visitor survey (Bishop and Gimblett, 2000). VR also enables the possibility to observe people virtually, thus applying netnography. Thus, VR can substitute a lifestyle that is not allowed for a certain group restricted by laws, social norms or rules. For instance, Tavakoli and Mura (2015) observed the travel behaviour of an Iranian woman in SL. The Muslim woman is restricted when travelling by Muslim laws as well as social norms. When creating their avatars the majority tried to match their appearance in real life. Moreover, avatars resembled Western culture characteristics such as ignoring headgear and being 'sexy' and their travel behaviour was characteristics of enjoyment and fun. Hence, as the examples show, VR can help tourist destinations to plan and run simulations before applying them to the real world.

3.6.3. Education and Training

VR can also train a worker in the tourism industry or provide knowledge about the destination. For instance, Dos Santos and Frage (2002) used VR to create a virtual community to share information about the ruins of the church of Sao Miguel das Missoes. In this case, VR aims to increase awareness to inform about the history and conserve the cultural heritage. Further VR application in tourism involves simulating different situations for employees and management and thus teaching skills and gaining experience to avoid making mistakes in real-life situations. For instance, simulating different locations such as a tourist office and allow users to enter with an avatar and communicate with other robot-avatars or even live communication with people. From a stakeholder perspective, different real-world scenarios can be applied and staff can be trained (Braun and Slater, 2014). Likewise, VR can be used to recreate destination sites and train tour guides by letting them experience different virtual tours and thus prepare tour guides for real-life situations (Hsu, 2012). Consequently, VR can transfer knowledge to increase information about attractions but also to train employees to provide better services and also to reduce costs.

3.6.4. VR Environmental Studies and Tourism

Technologies such as ICT are discussed as novel approaches for sustainable tourism at the destination (Ali and Frew, 2014). In this line of argument, VR application within an environmental context has shown several positive outcomes that are important for tourism. In this sense, pro-environmental behaviour is considered as a positive outcome as ecologically aware customers prefer a VR activity rather than a real activity to diminish environmental problems. Thus, destinations might encourage the customer to switch from real to virtual to reduce negative environmental impacts (Han et al., 2014). Furthermore, threatened marine environments can use VR to build underwater tour guided panorama views for tourists and hence diminish the damage. Moreover, this system also allows divers to inform before diving and thus knowing the route to preserve the natural environment underwater (Chen et al., 2012). In addition, VR might be used to encourage educational trips and thus significantly reduce carbon dioxide emissions and consequently contribute positively to the climate (Schott, 2017). Further studies such as Yu et al. (2018) explored health-related aspects within forest and urban environments. They also found positive impacts of psychological health in forest environments showing how VR can serve as a tool to increase access to natural environments. A more recent study by Mattila et al. (2020) examined the restorative power of a VR forest identifying positive restoration outcomes, improved vitality and mood that were comparable in experience a real forest. Also, sustainability can be increased through VR, as shown by Atwa et al. (2019), by designing green business parks to balance sustainable concepts and attractive places to satisfy people. Furthermore, second chance tourism allows reviving tourist destinations from destroyed or deteriorated places. The reconstruction of an attraction or location in VR helps the digital preservation of cultural destinations and help to protect cultural sites from over-tourism or destruction (Bec et al., 2021). Hence, VR studies within an environmental context examined the benefits of applying VR as a new way to enhance pro-environmental behaviour, sustainability, and well-being. However, environmental studies are scarce within VR and tourism and therefore, the VR experience is not fully examined in these areas.

3.6.5. Ethical considerations and negative effects of VR

Many studies focus on the positive aspects of using VR systems in different areas. However, there are also negative effects that should be addressed. A negative aspect may be VR sickness causing headache, vertigo or nausea (Tanaka and Takagi, 2004; Palmisano et al., 2017) and may be seen as a serious obstacle for buying HMD's from a consumer perspective and thus diminish its success (Jung et al., 2018).

However, it might be assumed that VE is not harmful because something solely happens within an artificial environment. Nevertheless, VR can affect people mentally as Søraker (2012) divided between 'intravirtual' and 'extravirtual' effects. The former relates to the consequences of a person's action within the VE, while the latter corresponds to the physical world, thus, the user's experience is part of the VR experience. For instance, moving a body (extravirtual) where this movement affects the movement of a virtual object (intravirtual) within the VE. On contrary, this also counts for the reverse effect of an intravirtual experience that might affect a user negatively and cause mentally damage based on the mental state of the user (Søraker, 2012). In this sense, Søraker (2014) stated several ethical issues may arise. For

instance, people may get attached to virtual objects and show inappropriate behaviour within VR. This might lead to a desensitise attitude towards reality. Moreover, people might want to escape their daily life for several reasons and therefore will spend more time in VR and consequently neglecting their social environment. This unbalanced lifestyle may reduce the sense of reality. Furthermore, the author also addressed moral and legal issues such as torture, rape and murder in VE. Hereby, the question is if VR may prevent crimes by letting people live their fantasies virtually. While this decision will be made by an individual examples are showing how other people may force other people to unwanted actions (Søraker, 2014). For instance, Dibbell (1993) described an unwanted virtual action as a rape in cyberspace where a user executed violent action against a female character and her will. This action caused psychological damage to the real person which also made her crying. Moreover, several media reported a repeatedly sexually assault in VR where a female player has been touched on sensitive spots. The affected person describes the negative feelings as real, which lasted several days after the incident (Wong, 2016). Also, a study by Jouriles et al. (2011) found that the negative effects of sexual threat were higher in VR than in faceto-face roleplay. Thus, there is the responsibility of the content producer which have to prevent any harmful actions from and to other users.

Furthermore, the accuracy of content is important since VR prepare for real-life situations such as military or surgeons, the information presented need to be as accurate as possible to prevent misconceptions of behaviour in real life (Søraker, 2014). Not only adults, but negative effects are also existent for children. For example, VR may strengthen the effect of creating false memories in children. As argued by Segovia and Bailenson (2009) false memories can be elicited through narratives and images but require actively cognitive effort. However, in a VR context, the child may produce false memories of false events when they observe themselves passively as avatars in a VE. Thus, manipulation may occur without any psychological effort of people and their knowledge. To conclude, VR enables positive impacts for researchers, practitioners and consumers, however, VR may also cause negative physical and psychological effects. Especially moral and legal issues have to be discussed by society and politics with further development of VR technology as it might become a part of our everyday life.

3.7. Summary

The literature shows a variety of different applications of VR within the tourism or tourism-related studies. This indicated that VR is applied to a vast range of areas and thus might change future tourism. As Williams and Hobson (1995) stated predicting the theoretical impacts of VR in tourism and society is easy but hard to predict its practical and realistic impacts. However, because of the price drop and the development of VR technology more research will follow and thus VR studies in tourism can be considered at the beginning of its stage in terms of practical implementation. Consequently, VR moves away from theoretical implications to the practical stage.

Reviewing the VR chapter a few key themes were identified. One of the main themes considered VR as an experiential medium. In this sense, the literature on VR technology has shown that VR has moved from a theoretical and development stage into an applied stage. This was evident as VR experience was part of the peoples' experience. This range of experiences were observed in many areas such as being purely entertaining, educational, or used in a more serious matter such as providing health benefits. A second theme relates to VR as a novel experience. The literature has shown that VR was getting more popular and growing into many areas providing new experiences that were not possible before. The type of virtual experience can be seen as either complementary or substitutional. In both cases, VR has demonstrated to provide mostly a positive experience leading to beneficial outcomes for many participants. Another theme relates to VR as a fully immersive experience showing that its potential impact has not been fully explored yet. The literature review observed a recent interest in studies demonstrating how VR is used in different contexts. However, there is a lack of existing theoretical understanding as research is relatively new within an applied VR setting. Thus, its impact such as on society or business environments is not fully explored and understood. Considering that VR technology is progressing fast, new abilities emerge on how VR can be used. These may change the current knowledge as new developments also change the VR experience. This does not include its impact on individuals and their social interaction but also how business or any other stakeholder may benefit from VR.

Chapter 4- Rural Tourism

4.1. Introduction

This chapter discusses the relevant aspects of rural tourism. Therefore, one of the key aspects includes rurality. In this sense, definitions and conceptualisations of rurality are presented from different perspectives. Further, the importance of the landscape in rural places is discussed providing an overview of its values and what aspects are preferred and important for PA. Moreover, the consumption of rural destinations is outlined including the challenges and opportunities for the destination. This also includes how innovative technology can have a positive impact on rural tourism.

4.2. Defining 'rurality"

The term 'rurality' refers to the meaning of how a rural environment and landscape is viewed and what elements should be included (Zografos, 2007). Further, the definition of the term rural and its meaning is complex as several reasons contribute to its complexity. Firstly, rural can be a transversal concept which means different academic disciplines apply a variety of definitions for rurality. Secondly, rural is a relative concept and is characterised by changing definitions and measurements (Balestrieri, 2016). Furthermore, the term 'rural' is argued to be an elusive concept referring to several independent ideas which have developed dynamically over time but in-self not coherent. Further, it can be argued that 'rural' is an imagination, then presented before it appears as places, landscapes and as a way of the social rural life. The dynamic process of rurality is caused by experiences made by people in those rural places and rural life which reshape their imagination of rurality and thus it is reproduced (Woods, 2012). Consequently, different interpretations exist. Further, cultural aspects also play an important role when shaping rurality produced by different media such as TV, literature, movies and art contributing to the diverse rural imagination and understanding (Crouch, 2006). One of the key aspects how rurality is perceived is expressed through the concept of the rural idyll which is also an important factor for rural tourism.

4.2.1. The rural idyll

When rurality is imagined the rural idyll is an important and strong aspect of the rural environment. The rural idyll can be described as a place of peace, tranquillity and an idealistic image that stands in contrast to the busy city (Woods, 2012). An essential

aspect of the rural idyll is its continued ability to be always present and adapt to changes over time. This dynamic transformation of the traditional image of the countryside is a part of the rural ideology representing the countryside as part of the national identity since it possesses heritage capital (Little and Austin, 1996). As Short (2006) demonstrated the concept of the rural idyll is old. It exists throughout different past epochs representing an idyll that is opposed to urban developments that are usually perceived as negative. The rural idyll describes how people are looking to establish a balance between humans and nature (Short, 2006). In this line, Bunce (1994) referred to the rural as 'armchair countryside' (p.37) where the longing for nature and rural life emerges as an answer due to the disruption of the environment through urbanisation processes such as industrialism. Consequently, people got detached from the natural environment, rural life and landscape.

The key aspect of the idealisation, images and values of the 'rural' was given by literature, art and largely influenced by mass media. As a result, the countryside is imagined by people in different ways such as from a mythic or romantic side which creates a sense of nostalgia and encourages people to seek real experiences of the natural environment and for rural life (Bunce, 1994). For instance, Vepsäläinen and Pitkänen (2010) showed that the Finnish rural idyll is closely linked to the Anglo-American idyll where wilderness is recognised for its visual features, romantic character and landscape for recreational activities. Further, Britain and North America share a common historic tradition of the representation of the rural idyll (Bell, 1997). However, unlike in Britain, where rural idyll is more rooted in a more romantic idea and thus represents part of the romanticism, the idyll in the United States represents the idea of Jeffersonian ideals representing the self-sufficient way of a 'yeoman farmer' (Harrington, 2018).

A subtheme of rural idyll is also dedicated to children as the rural childhood idyll is packed in stories about the children country life in a rural setting (Philo, 1992; Jones, 1997). As Matthews et al. (2000) described the rural idyll from the viewpoint of children stories as '...a sense that the countryside is the last refuge of 'primitive innocence', a state of human unsullied by the penetrating and corrupting values of urbanism...' (p.142). Further, they highlighted the environment as a well-organised place, a place of purity and a perfect way of life where children can grow up safely (Matthews et al.,

2000). This positive representation of the countryside is not solely imagined by children instead of how in general the countryside is viewed (Jones, 1997). Thus, stories are consumed by children and parents and consequently shaping the representation of the rural idyll (Matthews et al., 2000). Also, the social environment with harmonious social relationships is an important aspect of the rural idyll where rural life is imagined as simple, innocent and as an authentic community that appreciate traditional values of the past. Furthermore, rural communities seem to be happy and show solidarity where everyone is helping each other. Thus, it represents a nostalgic view of the past life where urban people can escape from the contemporary life where these good values seem to be lacking (Little and Austin, 1996).

4.3. Defining Landscape

In rural areas and thus in rural tourism landscape is one of the most important dimensions where tourists are looking for authentic tourist experiences within a cultural and natural context (Carneiro et al., 2015). The European Landscape Convention (Europe, 2000, p.25) defined landscape as 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'. Riley (1992) defined it as a setting for human experience and activity. Furthermore, Landscape also serves as a symbolic environment as defined by Greider and Garkovich (1994, p.1) "Landscapes" are the symbolic environments created by human acts of conferring meaning to nature and the environment, of giving the environment definition and form from a particular angle of vision and through a special filter of values and beliefs. Every landscape is a symbolic environment". Another approach of defining landscape is given by Termorshuizen and Opdam (2009) by seeing the landscape as a structure-function-value chain where the characteristics of the landscape represent a certain type of function which can be valued by people. Hence, people's perception is an essential aspect when defining the landscape. Moreover, based on people's preferences they may have strong feelings towards their favourite landscapes. In addition, an important aspect is that landscape can contribute to people's identity and health. Therefore, the visual quality of the landscape is a key element and through landscape development, it may also impact people's perceptions (Tveit et al., 2013). These developments in the countryside can be political, economic or cultural and hence landscape values change and peoples re-evaluate those and may attach new meaning to them (Alexandra and Riddington, 2007).

In this line, the evaluation of the landscape preferences is based on two paradigms as Lothian (1999) described. The first evaluation process reflects the objective paradigm where landscape characteristics can be mapped and classified using a numerical scale to distinguish between low, medium and high quality. For instance, landscape features such as mountains and rivers can be grouped into high-quality aspects. The objective approach assumes that the landscape quality is inherent and that its physical features can be appraised. Hence, an intrinsic landscape can be measured based on its intrinsic physical criteria which is also reflected in postcards, videos or books representing a high landscape quality. This is important for tourists where the landscape is presented as a place to be travelled, experienced and to be enjoyed. The second paradigm is based on the subjective measurement of landscape preferences. Thus, landscape quality is derived from the viewpoint of the individual and consequently perceived through people's interpretation, memories, imaginations or symbols of what the landscape represents (Lothian, 1999). Nevertheless, these two paradigms predominantly present positivistic models and phenomenology approaches consider the landscape quality as a product of the landscape and the observer (Tveit et al., 2013). However, according to Bell (1999), when perceiving the landscape and giving meaning to it the landscape represents a natural or beautiful scenery and thus the most used sense is the visual sense with landscape aesthetics. For example, Agapito et al. (2017) showed that the most visual component for tourists at the destination is the landscape when visiting the place and after returning home it is the most recalled visual component. This shows the importance of the visual sense as, according to Larsen and Urry (2011) identified, the vision is a fundamental aspect for tourism, and it is related to experience and memories. Furthermore, vision and tourist gaze is linked to photography, including in digital form, as a tangible object to develop and lengthen the tourist gaze by recalling holiday memories. The focal point of 'tourists' gaze are buildings, built themes and different heritages to stimulate the visual sense. Tourists select these places to gaze upon them and expectations are built through daydreaming by using their fantasy (Larsen and Urry, 2011).

Furthermore, tourists might develop with pictures their relationship and interpretation with a destination resulting in motivating them to visit the place. However, meanings and interpretation of these images are subjective and differ from tourist to tourist (Ye and Tussyadiah, 2011). Images do not solely represent the destination as a product.

They also communicate attributes, characteristics, concepts, values and ideas (MacKay and Fesenmaier, 1997). However, other sensory experiences are also important when tourists interact with the landscape (Larsen and Urry, 2011; Bell, 1999; Carneiro et al., 2015). Nevertheless, the visual factor remains the most important sensory element for establishing a positive and memorable tourist experience at the destination as well when returning home (Agapito et al., 2017). Consequently, many studies of perceiving landscape characteristics are using photographic elements and other visuals to help to explore people's perceptions (Carneiro et al., 2015).

4.3.1. Landscape values

According to García-Martín (2016), humans are linked to the landscape through different landscape values involving the socio-cultural perception of landscapes. Firstly, people appraise landscape for its physical characteristics and its socio-cultural dimensions. Thus, different perspectives are involved when people evaluating the landscape. Moreover, socio-economic aspects, knowledge and experience have also an impact on how the landscape is perceived. Moreover, intangible factors such as aesthetics and recreational values are considered when evaluating the landscape. More complex values such as a SoP, tranquillity and spirituality are also part of the assessment process. Hence, the complexity of the landscape and its evaluation is based on tangible and intangible aspects when giving meaning to it (García-Martín, 2016). An overview of different landscape values is identified and presented in table 4.2 (García-Martín et al., 2017).

Landscapes values	Meaning			
Nature related	Appreciation of plants, animals, wildlife and biodiversity			
Harvesting	Appreciation and purchasing of local food production,			
Local products	harvesting of agriculture products			
	Appreciation of environmental sustainability services of the			
Regulating services	landscape			
Outdoor recreation	Appreciation of the outdoor recreational activities and sport			
Aesthetics	Appreciation of the scenery and visual quality of the landscape			
Culture	Appreciation of local culture, history and memories			
	The feeling of sense of place, identity, spirituality contributing			
Feelings	to personal fulfilment			

Table 4 1	Landscape	e Values	and	Meanings
	Lanasoupt		unu	meanings

	Referring to spending time with other people and contributing			
Social fulfilment	to social well-being and social fulfilment			
	Appreciation of the existence of this place without referring to			
Existence	any benefits			

Source: Adopted by García-Martín et al. (2017).

According to García-Martín et al. (2017), the most common identified landscape values are aesthetics and recreational values. These two values are important values for rural areas but do not necessarily correlate since it depends on people's evaluation priorities such as being for the scenic view or part of any recreational activity (Tahvanainen et al., 2001). Moreover, the tangible landscape features are more place-related and can be classified in clusters. This means, for instance, that recreation, social relations, local food production and cultural heritage can be referred to as bundles and are landscape specific. However, intangible aspects such as feelings or spirituality which are linked to memories are more scattered among different landscapes. Furthermore, they refer to bundles that are connected to culture, heritage and traditions and represent important dimensions for creating place attachment and place identity (García-Martín et al., 2017).

4.3.2. Preference for rural landscapes

The rural landscape is an essential component of a tourist's experience where the scene is an important aspect (Vinge and Flø, 2015). However, according to Carneiro et al. (2015) research on landscape preferences has gained interest but still, research on tourists' perception of a rural landscape is limited. In general, tourists prefer natural scenes more than built landscapes (Kaltenborn and Bjerke, 2002a; Kirillova et al., 2014). Since visual quality is important, MacKay and Fesenmaier (1997) identified three factors of the visual dimension which are important, namely uniqueness, texture and attractiveness. Within the visual quality, as mentioned in the previous chapter, aesthetics is an essential dimension for perceiving the beauty of a landscape. In this line, Kirillova et al. (2014) found several aesthetics dimensions for a tourist destination as shown in table 4.3.

Aesthetics Dimension	Meaning
Scale	The scale of the place such as intensity of colours or physical proportions, degree of crowdedness, number of visual cues and spatial characteristics.
Time	Difference between modern and historic age as well as perceived age of local people
Condition	Clean environment as well as the maintenance of the physical environment
Sound	Pace, volume and source of the sound
Balance	Balancing between human touch and unspoiled nature, authenticity and artificial and cohesion
Diversity	Variety of visual cues
Novelty	Comparison between the familiar and new environment
Shape	Degree of complexity and shape of visual cues
Uniqueness	Quantity of unique features

Table 4.2: Aesthetics Dimension and Meanings

Source: Kirillova et al. (2014)

These dimensions are important for rural and urban environments, but tourists place different criteria. For example, tourists evaluate natural-based places more positively with less presence of people in contrast to urban places where this is viewed negatively. Moreover, these dimensions reflect touristic aesthetic dimension meaning they differ from previous literature aesthetics elements. This might be due to tourists' immersion within the tourist destination and assessment of a destination's beauty is made individually including more than the visual sense (Kirillova et al., 2014).

A theory-driven approach when evaluating the aesthetics of a rural landscape and its preference is shown by Rosley et al. (2013) proposing seven indicators, namely mystery, legibility, coherence, stewardship, openness, naturalness, complexity and disturbance. These indicators are also reflected in table 4.3 (Kirillova et al., 2014). In a recent study tourist's assessment of a destination is also influenced by people's home environment meaning that a destination is perceived as more beautiful when tourists home are less perceived in terms of aesthetics qualities (Kirillova and Lehto, 2015).

Moreover, according to Howley (2011) evaluation of rural landscape preferences depend on the socio-demographic characteristics (e.g. age, occupation, sex, place of residence, social class and farming background) and environmental value orientations referring to personal preferences of a landscape. This involves multifunctionality (providing a range of different goods and services), environmental apathy (people are

not interested in environmental issues of the landscape) and agricultural production (functional view of the landscape such as agriculture). Moreover, five landscape preferences are identified such as intensive farming, wild nature scenes, cultural landscapes, mixed farming and water-related landscapes as summarised in table 4.4 (Howley, 2011).

Water landscape	Cultural landscape	Wild nature	Mixed farming	Intensive farming
Rivers	Old farm buildings	Wild bushes	Open grassland with animals	Grasslands
Coast	Old castle	Scrub area	Animals grazing on open grasslands	Open woodland
Sea	Monuments	broad-leaved trees	Farm cottage	Farm fields
Beach	Mountain	Fields with bushes and hedges		Forest
	Cliffs	Mixed woodland		Tillage
		Grassland and marsh		Cut turf and hayfields
		Bog lands		
		Wild vegetation		

Table 4.3: Rural Landscape Preferences

Source: Adopted by Howley (2011).

Further, Arriaza et al., (2004) found that for rural areas the degree of wilderness and positive human-made changes in a landscape are important visual qualities. Moreover, water and colour contrasts are also important in landscape vegetation. A more recent study by Carneiro (2015) presented five characteristics for rural places which are important for rural tourist experiences, such as vegetation involving type, diversity and concentration. Secondly, different slopes referring to mountains or flat land. Thirdly, water such as lakes or rivers. Fourthly, buildings such as traditional houses, stone walls or monuments. The last aspect includes the presence of people. These preferences are part of the landscape features that can be used in tourism and leisure. Especially water and openness can be found across the landscape as strong preferences (Howley, 2011; Kaltenborn and Bjerke, 2002b; Uusitalo, 2010). However, landscape perception and preference are complex and characterised as a multi-dimensional construct. Even the visual aspect is very important landscape is also important meaning that people are an essential part of the landscape experience.

Moreover, the past and thus preserving the authenticity and the traditions are also part of the landscape that has a positive effect on tourist's experience (Carneiro, 2015). Thus, all these different and complex landscape characteristics are reasons why people prefer rural landscapes.

4.3.3. Landscape and place attachment

Landscapes are places where emotions play a key part when assessing landscapes either subjectively or objectively (Lothian, 1999). Thus, according to Soini et al. (2012), there is an intensive debate about landscape and place attachment in terms of a commodification process, as a part of the human experience or as a function of being home. Therefore, as Riley (1992) argued attachment to landscape is complex and aspects such as landscape image, made experiences and past and current memories affect people's attachment to the cultural and social landscape. Hence, it is not just the physical place but reflects people's culture and identity (Moore, 2015). A recent study by Blackstone (2017) identified the identity of 'Englishness' which is constructed through folk songs and the English landscape embedded within the rural idyll. Furthermore, as the author explained, the rural idyll symbolises England while the landscape and it made experience holds its values (Blackstone, 2017). However, the combination between landscape and sounds strengthens the landscape's image and experience because sound stimulates the landscape and makes it more alive. Moreover, the rural idyll represented as a pure and eternal landscape is the reason why people perceive rural environments as spiritual and its importance to building on people's identity (Blackstone, 2017). In this line, depending on different regions people may have a specific landscape identity relating to their cultural region (Fornara et al., 2016).

Nonetheless, according to Puren et al. (2018), environmental transformation can lead to a loss of the unique rural landscape and therefore risk people's place attachment to nature. For instance, contemporary landscapes may change due to homogeneity or touristic transformation processes and therefore lose their iconic value communicated through media or paintings and thus shifting people's identification. Thus, new landscape creation is one solution where identification can be re-established (Nogué and Wilbrand, 2018). Another emotional state is homesickness where landscape represents home and as shown by Morse and Mudgett (2017), out-migration can cause

positive and negative emotions where people longing for their home landscape and thus showing a strong attachment. Moreover, people assign personal and cultural meanings to those places and through media or visiting their landscapes they mitigate homesickness and keep their identity. Hence, landscape and rural idyll are important dimensions contributing to a person's place-identity representing an important aspect of place attachment (Twigger-Ross and Uzzell, 1996)

Furthermore, place attachment is linked to landscape values as Brown and Raymond (2007) and Brown et al., (2015) used landscape mapping techniques to explore people's attachment. For instance, Brown and Raymond (2007) applied place-scale and map-based measurements and findings show that aesthetic and recreation are the most important landscape values for tourists as well as for residents. Furthermore, the scale-based measure shows that knowledge about the region and support for the environment are correlating significantly with place attachment. Moreover, landscape values such as spiritual, wilderness and aesthetic value are significant predictors of place attachment but explain a small amount of variance. Similar to small explained variance is the map-based place attachment where wilderness and spiritual landscape value are significant predictors. Moreover, a bundle of landscape values such as aesthetic, wilderness or natural landscapes in combination with recreation or therapeutic values provide the basis for place attachment (Brown and Raymond, 2007). In a recent study, Brown et al. (2015) used public participation geographic information system to map landscape values and place attachment. The results show great variability of PA mapped areas among different groups such as rural residents identify smaller areas while people with pro-environmental attitudes mapping greater areas. However, as the authors state that it is a new method for capturing the landscape values to PA and therefore provide suggestions for further research such as measuring the intensity of PA in combination with a range of drawing methods to capture the PA area. Furthermore, participants should be asked how each landscape value is associated with PA (Brown et al., 2015). Another recent study by García-Martín et al. (2018) found that perceived landscape values linked to culture, social interaction and aesthetics show a stronger attachment to landscape.

A rural study conducted by Kaltenborn and Williams (2002) showed how landscape preferences are linked to PA. Since landscapes are heterogeneous objects people

assess them differently and thus place different meanings to the landscape which affects the degree of their attachment. In a previous study of Kaltenborn and Bjerke (2002a) four landscape preferences were identified such as 'Modern agriculture', 'Farm environment', 'Wildlands' and 'Cultural landscape' and used for a follow-up study by the same authors. Based on several photographic images participants were asked to identify their preferred landscapes. Results show that place attachment was found significant for the 'Farm environment', 'Wildlands' and 'Cultural landscape'. Moreover, people have strong preferences for the natural environments with forests and lakes as well as for log cabins or summer farms. On the other hand, as less preferable are scenes with a modern form of agriculture. Furthermore, PA correlates with attractiveness which means that the higher the attachment the more attractive is the natural and farm landscape and hence considering the beauty of that landscape. Since beauty is related to positive emotions this can strengthen the link between landscape preferences and place attachment (Kaltenborn and Bjerke, 2002b). Also, Walker and Ryan (2008) examined place attachment and rural landscape preferences. They found the strongest attachment to water followed by farms, forests and open land and cultural scenes. Moreover, Lokocz et al. (2011) revealed also strong place attachment to natural areas such as forests, rivers or open fields, followed by agricultural areas relating to farms, orchards or pastures and cultural landscapes involving historical buildings in the town.

Moreover, recreational and aesthetical aspects are important for participants. According to Massoni et al., (2016) groups may prefer different landscape preferences. For example, while farmers are more interested in agriculture views residents and tourists share similar preferences. Additionally, different locations, familiarity and attachment impact the visual landscape perceptions since it represents the main dimension when people interact with the landscape. Thus, landscape perception affects PA where the rural place can be seen either as an area, a scenic view as a cultural or social construction and as a representation where rurality is a positive aspect towards rural environments where people have a strong attachment to those places (Soini et al., 2012). Moreover, as Pratt (1996) argued rurality is used for the cultural interpretation and represents the naturalness of landscape and thus is a qualitative measure. However, memories, social interactions, history are part of the landscape that contribute to its understanding by individuals (Smith, 2003). In this line, PA can

also be established to ideal places and thus to places with a positive rural idyll where nostalgia and positive aspects are grounded in the past of an idealised landscape (Harrington, 2018).

4.3.4. Rural tourism

Rural tourism is hard to define and there and there is no clear definition of what it is meant by rural tourism (Carson and Koster, 2015; Sasu and Epuran, 2016). In general, it can be described as a diverse activity in a natural or built environment (Jepson & Sharpley, 2015). Additionally, different names exist for rural tourism such as farm tourism (Sharpley & Sharpley, 1997). However, the reason why it is hard to explain might be that the general tourism industry itself is a complex construct involving several sub-divisions which can be either tourism-related or classified as another economic activity (Holden, 2016). Nevertheless, the rural tourism industry is so far the most obvious visible characteristic when analysing the restructuring of rural environments. In this line, some areas are more advanced due to a long history of being a traditional tourist destination such as National Parks, whereas in common agricultural regions rural tourism is a more recent phenomenon (Woods, 2012). The authors Lane and Kastenholz (2015) described the development of rural tourism in three phases as presented in table 4.5.

Rural tourism phases						
Phase 1	Phase 2	Phase 3				
Timeline						
1970	Mid 1980	Currently (21st century phenomena)				
Rural tourism as a diversification tool for an economic answer of the declining agriculture sector. First rural tourism products involved farm-related and other forms of businesses such as hospitality or culture attractions.	Growth produced complex and diverse rural tourism activites. For example, agrigourism, wellness tourism, activity tourism, sport tourism, culture and heritage and food and wine tourism.	Some destinations face a declining rural tourism industry. Innovation and changes are needed to keep the growth.				

Table 1 1.	Overview	of difforant	rurali	touriom	otogoo
1 able 4.4.	Overview	or unrerent	luia	lounsin	slaues

Source: Rural tourism development: Lane and Kastenholz (2015).

According to Lane and Kastenholz (2015), the first phase started at the beginning of 1970 as an emergence stage where rural tourism served as a form of low risk and costs of new economic opportunities for rural businesses. The second phase is marked
as a consolidation growth phase where rural tourism refers to complex and diverse tourism forms. Moreover, it was recognised the importance of enjoyable rural tourist experience, the contact to the local rural community, the physical interaction between tourists and the rural environment and through local cooperation to create and to provide new rural tourism products. the third phase is characterised by a high saturated market and rural destinations facing a market decline. Further, the authors described new types of tourism such as cruise ship tourism and city tourism which adds pressure and increase the competition within rural tourism destinations (Lane and Kastenholz, 2015). One way to oppose these developments is to be innovative. For example, as Kurtyka-Marcak and Kutkowska (2017) stated that the EU's rural development policy such as the rural development program focuses on innovation and creativity. Hence, enabling rural destinations to need to develop new concepts (Sasu and Epuran, 2016; Park and Yoon, 2009). However, rural tourism involves many different rural destinations and therefore the phases vary among destinations. Moreover, it can be argued that most rural areas are being at stages one and two and close to entering the third stage. This development is determined by an increase of new competition, socialcultural changes as well as political and economic factors (Lane and Kastenholz, 2015).

In rural tourism, agri-tourism plays an important role when creating new business strategies (Randelli et al., 2014; O'connor and Dunne, 2009). In general, farm-tourism is based on the idea that tourists are looking for authenticity, primitive and nostalgic farming lives opposite to the contemporary life (Salamon, 2006; Kurtyka-Marcak and Kutkowska, 2017) or as Salamon (2006, p.331) formulated that urban people are 'seeking to reproduce a synthetic or gentrified version of farm life - 'Country Cute''. This trivialisation, however, vilifies the farmers and neglects their current life situation (ibid). Nevertheless, it is more the aspects of rural tourism to maintain the traditions of the countryside involving the old way of living and thinking and to keep the rural "character" which is represented by rurality and plays an essential part in the commodification process (Cloke, 1993; Lane, 1994; OECD, 1994). Nevertheless, further forms such as organic farming, natural farming, conservation tourism or second homes are also part of the creation of new economic activities in rural areas (Wu, 2018). Hence, the possibilities of new tourism forms are endless since, as Perkins (2006) states, that certain locations that are not been considered for touristic purposes can be commodified for tourism and leisure purposes by giving them new meanings.

However, as Cloke (1993) identified, when marketing rural areas, five repeating themes are important in rural tourism; Firstly, the landscape which represents the physical attraction within an area; Secondly, the nature as natural idyll including animals; thirdly, the historical aspect presenting the social construction of places; fourthly, family orientation meaning that rurality can satisfy everyone and the last aspect is craft and country fayre referring to gifts, special crafts and food which are typical and therefore representing those rural areas. These themes can also be understood as several single tourism packages representing a certain rural idyll which is important when marketing rural places (Woods, 2012). Hence, the tourism industry is part of the creation of different rural representations for each tourist (Crouch, 2006).

4.3.5. Rural destination

According to Morrison (2013), a tourist destination is a geographic region that attracts tourists and further includes several features. For instance, a tourist region can be scaled in different sizes ranging from a country to a city. Moreover, the infrastructure of a tourist destination provides several amenities, accommodations, restaurants and other buildings providing a mix of different attractions to tourists. Further, as the author argued, a tourist destination is managed by a destination management organisation that promotes and coordinates the tourist place. In this line, a tourist destination should have an image for people and be perceived as a place for various tourist offers. Moreover, a tourist destination should possess governmental laws, policies and regulations for a destination. Additionally, a tourist destination should embrace a variety of different stakeholders interested in the tourism business (Morrison, 2013). Hence, as Buhalis (2000, p.97) defined destinations as 'amalgams of tourism products, offering an integrated experience to consumers.' Thus, a destination is a product offering different features which change between destinations and tourists choose their preferred place based on their holiday desire (Kozak, 2002). Several reasons why people travel to different destinations can be categorised into two factors as proposed by Hsu et al. (2009) and shown in figure 4.1.



Figure 4.1 Internal and External Factors of a destination choice. Source: Hsu et al. (2009).

According to Hsu et al. (2009), the first aspect is internal factors that affect a tourist's choice of destination. For instance, psychological factors include escape or self-actualization. Physical factors refer to relaxation, health and overall well-being. Social interactions involve the visiting of friends and meeting other people. Finally, seeking and explorations refers to the search for novelty, adventure and enjoyment experience. On the other hand, external factors such as tangible factors are linked to the facilities, service quality, price, cultural resources, environmental quality and other tangible factors that might influence tourist's choice. On the other hand, intangible factors consider a destination's image and benefits that tourists might expect (Hsu et al., 2009). Hence, different destination features which contribute to destination's attractiveness as demonstrated by Reitsamer and Brunner-Sperdin (2017) showed that tourists perceive the setting holistically and affect tourist's well-being at the destination or, for instance, people's attitude and attachment to a destination (Reitsamer et al., 2016).

According to Holloway and Humphreys (2012), the success of a destination is based on three quality factors such as attractions, amenities and accessibility of a tourist destination. Moreover, tourist destinations can be classified into three distinct geographical aspects; Firstly, a seaside destination referring to resorts, beaches, boating vacation and other coastal activities. Secondly, rural destinations referring to natural landscape elements such as mountains or lakes and further provide agricultural tourism, visiting gardens, wildlife, national parks, rural villages etc. The third element involves urban destination which includes holidays in cities and towns (Holloway and Humphreys, 2012). Especially rural destinations offer a great variety of different tourist activities. For instance, rural destinations provide heritages sites, landscapes, fairs and rural experiences involving activities such as winemaking, harvesting, eating regional dishes and making handicrafts (Loureiro, 2014). While these factors can be considered as tangible aspects, intangible aspects of a rural destination are linked to the rural idyll which represents the rural destination image referring to cognitive and affective aspects and is also linked to the tangible aspects as shown by Zhou (2014). Moreover, the author identified three themes for a rural destination image such as resources referring to cognitive aspects such as the landscape, nature, heritages or agricultural lifestyle. A further theme is the 'reward' as the second cognitive aspect which involves the reputation of a rural destination and deals with the main questions if the destination is worth visiting. The third theme 'expected feeling/experience' represents the affective aspects and describes features such as enjoyment, nostalgia, harmony and other important experiences such as childhood memories, sense of rural innocence and friendliness, relaxation, peace etc. (Zhou, 2014). Thus, rural destinations are depended on nature and culture to provide motivations for touristic and recreational experiences for a variety of beneficial reasons (Carneiro et al., 2015).

4.3.6. The importance of nature in rural destinations

Nature is besides 'rurality' a key aspect in rural places, where tourists seek relaxation, silence, peace and clean air. In addition, rural tourism offers visitors and tourists also a rural SoP, where nature and rural environment serves as a basis of emotional completion (Jepson and Sharpley, 2015). This can be traced back to the Romantic Movement where nature and especially the landscape shifted people's perception of the natural environment where tourists have the longing to experience a beautiful and unspoilt landscape (Holden, 2016). This view of nature from tourists was not always present. For instance, the Swiss Alps were seen in the past solely as a border between North Europe and Italy. Nowadays, tourists view the Alps in a romantic way and very attractive scenery which is an important income for Switzerland (Barsham and

Hitchcock, 2013). Further, according to Seaton (2012), Romanticism and the ideological change towards nature had the greatest impact on tourism which is still responsible for tourists' demand and behaviour nowadays. Therefore, the tourism industry which is depending on an intact nature also has the responsibility for the sustainable consumption of the countryside. Moreover, there are four types of experiences when interacting with nature as shown in figure 4.2 (Holden, 2016).





According to Holden (2016), the environment can present a setting for carrying out different settings. The focus is more on the physical surroundings and characteristics for tourism and leisure purposes. Hereby, experiences can range from being passive such as sun-bathing to very active such as white-water rafting. These several activities as Perkins (2006) explained were practised by local people as part of their daily life and later transformed into activities as part of tourists' experience at the destination. Hence, boating, fishing, horse riding and many other activities are altered (e.g. technology) and offered to tourists as new products. And, according to Kyle et al. (2004), natural settings are eligible to provide these different physical activities. Consequently, rural areas are perceived as escape trajectories opposite to urban areas. Therefore, rural tourism shows to be an attractive research area for academics and also for professionals due to the tourist potential of rural places. In particular, higher demand for rural tourism can be seen for many outdoor and recreational activities in the countryside but also to interact with nature (Kastenholz & Lima, 2011; Kastenholz et al., 2012).

The social environment can be seen as a place where tourists interact with family or friends (Holden, 2016). As Kyle et al. (2004) suggested that people are looking for shared activities with others within a natural environment which may enhance the link to that place. According to Sharpley and Jepson (2015), current tourists' experiences are influenced by their family trips made in the past where memories of these holidays are an essential part of the existing experience. However, the interaction also occurs between the host and the tourist. Especially in rural tourism, this is an important aspect since tourists looking for an authentic life of rural residents representing their culture and rural community (Kastenholz et al., 2015).

The emotional aspect of the natural environment refers to a deep emotional connection to nature to provide a sense of well-being (Holden, 2016). This emotional bond to nature may lead to PA where individuals develop deep feelings about a place and may become part of their identity (Raymond et al., 2010, Kyle et al., 2004; Scannell and Gifford, 2010a). For example, according to Jepson and Sharpley (2015), the Lake District can be considered as an emotional escape from the daily urban life of tourists. Hereby, tourists reach a higher level of the emotional level while gazing upon the aesthetics quality of the landscape. While for some part of the tourists that was a strong emotional experience, for others, the interaction with the natural environment possesses a stronger emotional effect. However, a combination of both seems to be the right combination to deepen the term was used interchangeably by tourists and is dependent on each individual due to its interpretation (Jepson and Sharpley, 2015).

Further, it is argued that nature holds a religious dimension. For instance, if tourists are looking for spirituality by being in nature and experience several landscape characteristics such as rivers, forests, streams or fields. Moreover, it is assumed that spirituality is present as an aura within the natural environment (Seaton, 2012). Also, as Timothy (2013) argued, people found solace in nature where religion and faith in God are deeply intertwined with the natural environment where mountains, rivers, forests and caves are perceived as the most sacred characteristics within it. However, these features are not only important for religious tourism rather also consumed by culture and nature-based tourists' forms. Therefore, it is not surprising that people prefer closeness to the water, trees and savannah-like views (Mahidin and Maulan, 2012). Moreover, based on that preferences it leads to a physical and emotional

dependence between human beings and nature (Davis et al., 2009). Additionally, the preference for the natural environment over the urban environment indicates an emotional attachment of people for rural areas which are also grounded in an evolutionary process where human beings lived in nature and benefited positively (Davis et al., 2009; van den Berg et al., 2007). The last dimension, according to Holden (2016), involves the merger of nature with self. This means the natural environment is not seen as an external environment rather it represents one's identity where harm to nature is perceived as harmful to itself. Hence, tourists develop place identities where they feel a belonging to the place or a feeling that a place belongs to them (Kneafsey, 2000). Based on the destination, rural tourism may also contribute to the national identity of local tourists (Silva and Leal, 2015). The creation of a unique place identity also depends if the tourist destination is national, regional or a local tourist environment which is part of the marketing strategy of a destination management organisation (Dredge and Jenkins, 2003).

4.3.7. Lake District National Park

In many countries, National parks are an important part of their tourism industry. This can be either tourism or recreational oriented (Butler and Boyd, 2000). One of the most important National Parks in the UK is the Lake District National Park where tourism is the key income source for the Lake Districts. According to the Lake District National Park (2021b), around 15.8 million tourists visiting the Lake Districts each year. Furthermore, LDNP which is in the county of Cumbria in England covers an area of 866 square miles (2,243 square km) (Britannica, 2021).



Figure 4.3 Map of Lake District National Park Source: Lake District National Park (2017).

According to Denyer (2013), the Landscape of Lake District has attracted researchers, politicians, artists and tourists for over 250 years emphasising its cultural and natural resources. In this line as Walton argues the LD is mostly valued by its aesthetics, its great variety of activities for tourists and its potential for unique culture value (Walton, 2013). Thus, it is not surprising that LDNP has been awarded as UNESCO World Heritage since 2017 underpinned by three themes: cultural landscape, farmed landscape and its inspiration, art and love for the place (Lake District National Park, 2021a).

4.3.8. Rural tourism and Immersive technology

Besides all the positive aspects and benefits of rural tourism, there are also threats. For instance, according to Lane and Kastenholz (2015), rural areas are facing stagnation or a decline in growth because of the market saturation within an area. Furthermore, new types of tourism such as cruise ship tourism and city tourism add pressure and increase the competition with rural destinations. One way to oppose these developments, for instance, lies in innovation and creativity (Kurtyka-Marcak and Kutkowska (2017). This might help rural destinations to develop new concepts (Sasu and Epuran, 2016; Park and Yoon, 2009). Thus, one solution for tourist destinations might be, according to Tussyadiah et al. (2018), the application of VR technology which is an innovative tool for tourist destinations and may affect tourists stay positively. The advantage of VR for rural destinations lies to provide a fully immersive virtual experience (Beck and Egger, 2018; Jung et al., 2018; Tussyadiah et al., 2018; Griffin et al., 2017). Thus, VR immersive technology in tourism may lead to an increase in economic and social benefits for rural areas.

4.4. Summary and Discussion based on the Literature

This chapter discussed the importance of rurality and rural tourism. By reviewing relevant concepts some key themes emerged. The first theme relates to subjective idealisation of rural destinations. This was evident as the rural idyll had different meanings for people. Some examples showed how rural place served as an escape of urban life, a romanticisation image of rural life, a deep connection to nature as intrinsic motivation or perceiving nature from a spirituality point of view. In all cases, the literature showed the myriad reasons what rural places can offer to individuals and consequently, how important these meanings are important for their attachment. Another theme refers to the significance of aesthetics and visual cues for landscape experience. The literature revealed different landscape values that were important on how the landscape was perceived and evaluated. This individual interpretation was linked to objective and subjective measures reflecting a supporting role in creating an attachment to rural places. Hence, landscapes enabled a visual experience of beauty and attractiveness by identifying key elements such as forests, mountains and water. However, the landscape did also hold intangible values for individuals such as identity or a symbolic meaning in people's life.

Furthermore, this section aims to integrate the literature chapters into a coherent structure and to demonstrate how each chapter is interrelated. The following figure 4.4 represents the graphical structure of the literature review guiding the research process to develop a PA framework for a rural destination within a VR context.



Figure 4.4 Graphical representation of the literature review

The foundation of this study lies in the PA theory which describes the emotional link to places. PA theory is a complex construct involving cognitive, affective and behavioural aspects. These aspects have been well explored in physical and social environments. However, due to technological development, particularly immersive technologies such as VR, tourists will have the opportunity to integrate VR into their holistic tourist experience. Thus, immersive technologies such as VR can be used as a pre-experience to have a virtual look before choosing and travelling to a tourist destination. Moreover, VR has the potential to enhance the tourist experience at the destination as well as after returning home. However, PA research neglects virtual places and therefore this study focuses on how VR experience from a PA theory perspective can be applied to explore the bond between tourists and the destination. Consequently, it is important to examine how tourists perceive tourist destinations in VR and therefore

to explore PA theory into virtual environments since tourists will spend more time in immersive virtual destinations. Furthermore, the focus of this study lies in the visual quality of the rural landscape. The reason for that is because the VR application provides a virtual 360-degree visual representation of the Lake District National Park from an 'eye-bird' view perspective. The Lake District is due to its importance as a rural destination a place for many domestic tourists that represent the target sample. Hence, this study explores how domestic tourists perceive the VR experience of the rural landscape of the Lake District.

The perception of the place is important because people get attached to places by giving them useful meanings. Therefore, tourists give meanings to rural landscapes by identifying certain landscape elements which are important for them. This can be because of childhood memories, diverse positive experiences within the destination, satisfaction, personal identification with the natural environment, involvement, seeking for spirituality, a place of well-being and health recovery or solely an expression of love etc., and thus developing an affection to that specific place. As a consequence, tourists returning to the same place and thus loyalty to a destination might be established. Closely related to the perception of the landscape is the idea of the rural idyll as one key aspect of rurality for tourists and therefore very important for rural tourism. The rural idyll represents a tourist's mental representation of a rural destination which impacts tourists' perception of the rural place and hence will have a direct effect on how tourists will perceive, interpret, value and give meaning to the rural landscape. Consequently, it is important to explore what landscape elements are important within VR to build and strengthen an emotional relationship to destinations that can be represented virtually.

Research to date shows a very limited number of studies focusing on the use of technology and PA. A few examples can be found in AR where interaction with a destination can lead to PA. However, in line with the research gap in the literature, PA theory does not reflect immersive VR experience and thus research on PA in VR is scarce. Therefore, this study combines the theory of PA with the idea of the rural idyll representing the mental representation of a rural destination within an immersive VR experience as a part of the holistic tourist experience at the rural destination. Further, all three aspects do overlap as shown in figure 4.5.



Figure 4.5 Overview of all three theoretical aspects

Moreover, it is important to point out that PA theory should be researched by all three aspects and thus be considered holistically. This means that people, person and process should be explored within the rural and VR context. Therefore, the aim of this study is then to develop a PA framework considering the rural idyll as an aspect of rurality by providing an immersive VR experience and hence exploring all aspects within VR.

4.4.1. Proposed base-line framework developed through the literature review

The literature review showed some key aspects that may be important for developing a PA framework in VR. Therefore, the following framework as presented in figure 4.6 served as a base model to be further developed during the primary research stages. With regards to the literature review on rural tourism it was identified that aesthetics played an essential part on how people interpret and assign meaning to rural places and landscapes. This interpretation could be explained through the different landscape values. In particular, the subjective interpretation of the idyllic view may elicit positive emotions and consequently leading to an emotional attachment. Moreover, PA theory also included the importance of the physical characteristics of places. Hence, the aesthetics of a destination could also be considered as functional place benefits. In this sense, the literature showed that aesthetic features might also be judged objectively determining the visual qualities of a place. Therefore, the first construct of the base line model is aesthetics that could be crucial in forming attachments to places.

However, it was further believed that the relationship between aesthetics and PA is facilitated through the concept of presence. In this context, as identified in the VR literature, presence mediates the sensorial experience between people and virtual places. Thus, the feeling of being part of the physical experience of a destination and capturing its aesthetic values is argued to be provided through presence. Furthermore, another variable of the model found within previous PA literature refers to place knowledge which is also considered as essential in forming meaningful bonds. As outlined the in the PA chapter, knowledge of places represents the cognitive aspects of PA theory. Hence, having information about the place characteristics, mental maps or knowledge of any objects is part of PA. This is also supported by the literature on rurality describing that place familiarity is important when evaluating people's attachments to locations. Therefore, current place knowledge can be considered important for developing PA. In this sense, the literature review on VR demonstrated how immersive technologies such as VR and AR were applied in different contexts as educational tools. Thus, VR experience is used to educate people and subsequently to transfer knowledge.



Figure 4.6 PA Framework developed through the literature review

Based on the literature review on PA, VR and rurality this study developed an initial framework for PA in a VR setting. This model serves as a base theoretical framework 121

and will be further extended and evaluated during the primary data collection and analysis stages of this study. However, it is believed that the model needs further research to refine or extend the current proposed model from the literature. In addition, the proposed relationships have not been fully explored within PA and VR context. Therefore, further research is needed to provide new insights into what extent the VR experience may confirm or reveal new aspects of how VR impacts the relationship between tourists and destinations. For instance, aesthetics was identified as an important concept when people form a relationship with a place. Although most of the studies indirectly refer to the visual experiences within non-immersive and immersive technologies, there is a lack of research on how VR provides aesthetic experiences and its impact on PA to a destination. Thus, it is unknown to what extent tourists perceive the visual quality of the destination and its specific role in forming a bond with the Lake District.

Similarly, the well-established concept of presence with VR describes a psychological process of being mentally transported to the location people see during their VR experience (Steuer, 1992). Although it is argued that it may add to the place experience and consequently be part of the tourist experience, there is a lack of understanding of what the exact role is. This also includes how tourists may perceive the place as part of their VR experience. Furthermore, as previously outlined, knowledge is part of any place experience and is also reflected in PA. Previous studies and various contexts have shown the role of technology in transmitting knowledge to people. However, further investigation is necessary to evaluate VR's ability in providing place knowledge in this study context. In particular, the literature review described previous studies that focused on the role of technology in informing tourists at the pre-stage of their travel (e.g. Gibson and O'Rawe, 2018). However, the question remains to what level VR can assist tourists' on-site experience about knowledge and consequently, to what extent it can be utilised as a part of developing PA.

Overall, the base framework provides the foundation for this study and highlights the limited research within this domain. The model has considered a few important PA elements that are linked to all types of technologies which may be relevant within a VR setting. Considering the scarcity of PA studies in VR, this contributes to a limited understanding of how VR affects PA at the destination level. Therefore, the direct

impact and understanding of a fully immersive VR experience on PA can't be fully considered in this base model. The exploratory research stage aims to reveal new insights into contextual PA dimensions. Based on this, this study aims to refine or extend the base model from a PA perspective. Consequently, the base model provides a good starting point, but the lack of research justifies further examination. This is believed to contribute to a more coherent PA framework. The reasons for doing so are twofold: First, evaluating the proposed PA themes and linking them directly to a fully immersive VR experience. Thus, gaining a better understanding of how VR impacts the tourist experience based on the current PA themes at the destination level. Secondly, exploring VR from a PA perspective and considering tourists' on-site experience, might identify potential missing PA themes that are not considered or represented in the literature and may play a key role in VR and tourists' PA to the destination.

Chapter 5 - Methodology

5.1. Introduction

The methodology chapter provides a detailed description of how the study was executed. In this sense, the chapter will discuss the research philosophy as the philosophical underpinning of this study. Based on that, the research approach, research strategy, research design and applied quality measures will be discussed. More precisely, the mixed-methods approach will be discussed in detail introducing research stage one (qualitative) and research stage two (quantitative). In this sense, for both stages, instrument design, pilot study, sampling, sample size, data collection and data analysis will be presented. In addition, applied quality and potential issues are further discussed.

5.2. Research Philosophy

According to Saunders et al. (2019, p. 130), a research philosophy 'refers to a system of beliefs and assumptions about the development of knowledge'. In this sense, the research philosophy reflects the personal values of the researcher which might be influenced by institutional principles and through research disciplines (Dougherty et al., 2008). Research philosophies represent the thoughts of the researcher about reality (Ontology), knowledge production (Epistemology) and provide the structure of the research process such as the use of theory, type of research questions, concepts and assumptions of the study (Moon et al., 2019). Besides ontological and epistemological questions, the philosophy also determines the methodology and hence informs the choice of methods and how data was analysed and interpreted (Crotty, 1998). However, based on the various ontological and epistemological stances the methodology is directly affected by these two aspects (Burrell and Morgen, 1979). In addition, as shown by Ruona and Lynham (2004), axiology represents methodology and methods referring to the actions of the researcher.

Within philosophy, the concept of ontology refers to how individuals see their world and environment (Ruona and Lynham, (2004). According to Guba and Lincoln (1994), ontological questions relate to what is real and what can we know about the real world that exists out there. Thus, it defines the nature of reality shaping the views and assumptions of researchers about how the world works (Saunders et al., 2012). In this respect, an ontology defines also the level of knowledge that can be gained in that

reality (Moon et al., 2018). Therefore, based on these views and assumptions ontology will have an impact on how research questions are formulated and how research is performed (Bryman, 2015).

According to Burrell and Morgan (1979), there is a debate of different ontological stances within the literature. For instance, ontology can be distinguished between nominalism and realism. The former relates to the external reality that is constructed by the individual where the environment is structured through names, labels and concepts. On the contrary, the latter refers to an external world made of a tangible and unchangeable structure. Hence, the world can be either socially constructed or can be perceived as hard material existing independently of our existence (Burrell and Morgen, 1979). While these two main concepts are evident in the literature different authors use various terminologies such as objectivism and subjectivism (Saunders et al., 2012), objectivism and constructionism (Bryman, 2015) or mechanistic and social ontology (Biesta, 2010). Hence, as Creswell and Plano Clark (2010) argued, this categorisation between subjectivity and objectivity reflects the discussion about dualism within research disciplines which informs the research process.

The second important aspect of philosophy is epistemology and deals with the question about acceptable knowledge within a research field (Bryman, 2015; Saunders et al., 2012). In this respect, epistemology questions the natural relationship between the participant (knower) and researcher (would-be knower) (Guba and Lincoln, 1994; Ponterotto, 2005). Moreover, according to Ruona and Lynham (2004), epistemology can be described as the theory of knowledge and relates how researchers know and think about the world. This relationship, as Biesta (2010) showed, can be divided into two aspects, namely, knowledge can be obtained (1) objectively or (2) subjectively. The former indicates a relationship that knowledge exists independent from the knower, while the latter involves a relationship where knowledge has a subjective element or is entirely produced by the knower (Biesta, 2010). In this line of thought, Burrell and Morgan (1979) referred to the epistemological debate and use positivist epistemology as the objective knowledge gained from the world. On the contrary, the anti-positivism position sees the world as relativistic, and knowledge is created from the inside and involves the views of individuals (Burrell and Morgan, 1979). Furthermore, the epistemological question is driven by ontology (Guba and Lincoln, 1994; Saunders et al., 2015). Hence, if objective reality is supposed then it is also

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assumed that the epistemology is within the objective domain. However, Biesta (2010) acknowledged both perspectives but also suggests that in some cases to detach epistemological questions from subjectivity or objectivity since there are 'unhelpful' and 'wrong' (Biesta, 2010, p. 103).

Within philosophy, axiology belongs to the study of values such as ethics or aesthetics and relates to research inquiry (Saunders et al., 2012). Moreover, according to Strang (2015) axiology refers to the theory of beliefs and how these impact researchers' value which is reflected within the research process such as religious or cultural values. Consequently, the researcher's values impact the research process between researcher and participants (Saunders et al., 2018). In this respect, axiology also refers to action and defines how research is carried out. Therefore, methodology and methods are important aspects of axiology guiding research and follow coherently the ontology and epistemology assumptions (Ruona and Lynham, 2004).

The same authors (Lynham and Ruaona, 1998) provided a philosophical framework showing how ontology, epistemology and axiology are interrelated and affect each other as shown in figure 5.1:





In this respect, according to Saunders et al. (2018), to evaluate research philosophies that help to shape the study's beliefs and assumptions about how knowledge was created it is important to understand these three different philosophical aspects. Thus, the research philosophy set the boundaries and served as a guiding process of this

research. Moreover, it enables justification of the applied methods and how the knowledge was created in this study context. This includes also defining the limits of this research process and contextualise the findings within a given spectrum.

5.2.1. Overview of Research Paradigms

Research philosophy can be organised into a specific worldview or paradigm relating to a common system of values and beliefs within research disciplines (Creswell and Plano Clark (2010). According to Collis and Hussey (2014), paradigms serve to identify a philosophical framework guiding researchers through their research process. A definition is given by Guba and Lincoln (1994) referred to as a view of a set of basic beliefs which represents and defines a worldview. According to Saunders et al. (2012, p.141), a paradigm can be defined as 'a way of examining social phenomena from which particular understandings of these phenomena can be gained and explanations attempted'. However, the concept of paradigm is not clearly defined and has various meanings (Morgan, 2007; Saunders et al., 2012). These different meanings were identified by Morgan (2007) distinguishing four different types of the meaning of paradigm as shown in table 5.1.

	Worldview	Epistemological	Shared Beliefs	Model
		stance		Examples
Characteristics	All-embracing	Distinctive belief	Shared beliefs	Example of
	concept and	systems of how	about the	best solutions
	thinking about	research questions	nature of	to problems
	the world	asked and answered.	questions and	
	including beliefs,	Focus on researcher's	answers in a	
	morals, values	worldview within	research field	
	and aesthetics.	philosophy of		
		knowledge		
	and aesthetics.	philosophy of knowledge		

Table 5.1 Four types of meaning for Paradigm

Source: Adapted from Morgan (2007)

As Morgan (2007) further explained, all four versions of paradigms can be referred to as a shared belief system that has an impact on how knowledge is going to be generated and interpreted. However, the difference relates to the level of generality of that belief system. In this respect, worldviews are the broadest definition and model examples are a very narrow view of paradigms (Morgen, 2007). In social theory, Burrell and Morgan (1979) identified four paradigms, namely, radical humanist, radical structuralist, interpretive and functionalist. Furthermore, other authors such as Guba and Lincoln (1994) described also four paradigms, positivism, post-positivism, critical theory and constructivism. Similarly, Bunniss and Kelly (2010) presented positivism, post-positivism, critical theory and interpretivism. Moreover, from an epistemological perspective, Bryman (2015) differed between positivism, realism and interpretivism. An overview of various paradigms within the business research context is given in table 5.2:

Worldview Element	Ontology (What is the nature of reality?)	Epistemology (What is the relationship between researcher and that being researched?)	Axiology (What values are involved?)	Methodology (What is the research process?)
Post positivism	Singular reality (Rejecting or fail to reject hypotheses)	Distant and objective	Unbiased (try to eliminate bias)	Deductive (Testing theory)
Constructivi sm/Interpreti vism	Multiple realities, socially constructed, subjective	Close to participants, Theories and concepts too simplistic Focus on narratives, stories, perceptions and interpretations New understandings and worldviews as contribution	Biased (researcher actively involved in communication)	Inductive (starting with participants views, build-up theory), in-depth investigation.
Participatory	Political reality (findings negotiated with participants)	Collaboration between researcher and participants	Researcher negotiate their biases with participants	Participatory (Involving participants in research process)
Pragmatism	Single and multiple reality	Practical meaning of knowledge in specific contexts 'True' theories and knowledge is those that enable successful action Focus on problems, practices, and relevance Problem-solving and informed future practice as contribution	Both (Unbiased and biased)	Combination of inductive and deductive, following research problem and research question Range of methods: mixed, multiple, qualitative, quantitative, action research Emphasis on practical solutions and outcomes

Table 5.2: Overview of research paradigms

Positivism	External, objective and independent of social actors	Only observable phenomena may provide facts and credible data. Focusing on causality and law- like generalisations. Reducing phenomena to simplest elements.	Value-free research, the researcher is independent of the data and maintains objectively	Typically, deductive, highly structured, large samples, measurement, typically quantitative methods of analysis, but a range of data can be analysed
Critical Realism	Stratified/layered (the empirical, the actual and the real) External, independent Intransient Objective structures Causal mechanisms	Epistemological relativism Knowledge historically situated and transient Facts are social constructions Historical casual explanation as contribution	Value-laden research Researchers acknowledges bias by world views, cultural experience, and upbringing Researcher tries to minimise bias and errors Researcher is as objective as possible	Reproductive, in- depth historically situated analysis of pre- existing structures and emerging agency. Range of methods and data types to fit subject matter
Post- Modernism	Nominal Complex, rich Socially constructed through power relations Some meanings, interpretations realities are dominated and silenced by others Flux of processes, experiences, practices	What counts as 'truth' and 'knowledge' is decided by dominant ideologies Focus on absences, silences and oppressed/repressed meanings, interpretations and voices Exposure of power relations and challenge of dominant view as	Value-constituted research Researchers and research embedded in power relations Some research narratives are repressed and silence at the expense of others Researcher radically	Typically, deconstructive – reading texts and realities against themselves In-depth investigations of anomalies, silences, and absences Range of data types, typically qualitative methods of analysis

Source: Creswell and Plano Clark (2010); Saunders et al., (2012); Saunders et al., (2016)

5.2.2. Paradigm Discussion

A critical debate relates to the application of various philosophical foundations within a research discipline. The main disagreement causing debates among researchers lies mainly between the positivistic and the interpretive paradigms (Hammersley, 1992; Teddlie and Tashakkori, 2009). As Mingers (2000) explained, a paradigm evolves through consensus within a research community where philosophical assumptions are accepted, and innovations may challenge existing worldviews but are usually rejected. According to Denscombe (2008), research communities vary in size and commonality and are dynamic groups and therefore offer a place for using different paradigms. As Willmott (1993) argued, new paradigms may evolve through political and technological development which might affect existing structure within society and challenge existing

paradigms and traditional knowledge. Moreover, it is necessary to change worldviews as a necessity to develop a new theory. Thus, different philosophies may be applied and informing research within a research field. This development can be observed among different disciplines. For instance, as Teddlie and Tashakkori (2009) and Gray (2013) exemplified, within the social science domain, the predominant orientation was placed on positivism or post-positivist paradigm. However further development has led to a shift within a constructivist and interpretivist paradigm. A similar development is also evident within marketing as Hirschmann (1986) showed and the evolvement in marketing has led to a change of the form of inquiry. In this respect, the human aspect has become important and therefore socially constructed research is part of the research field. Furthermore, according to Stag et al., (2013), research within environment psychology is also characterised as an interdisciplinarity research field and thus both paradigms are applied. This also accounts for tourism where research has developed and had an impact on epistemology (Tribe and Xiao, 2011), and therefore various paradigms are evident within the tourism literature (Khoo-lattimore et al., 2019). Thus, new knowledge can be generated through many layers reflected through the choice of the various paradigms. This leads to the development of new findings and contributes to theoretical and empirical progress within a research discipline. For the research purpose of this study, both an interpretive and a positivist paradigm are chosen to integrate both into a single study answering the research questions of this study. According to Tracy (2013), the goal of the research within interpretivism aims to answer questions of 'why' and 'how', whereas, positivism aims to try to measure and to predict empirical phenomena and hence to generalise findings.

However, combining paradigms can be controversial and some authors refer to paradigm 'wars' (Alise and Teddlie, 2010), meaning the incommensurability of different philosophical views. In this line of thought, few authors support the dichotomy of paradigms focusing on one research philosophy (Burrell and Morgan, 1979; Jackson and Carter, 1991), while others support the diversity of paradigms (Wiever and Gioia, 1994; Schultz and Hatch, 1996). The main arguments against using multiple paradigms lie within the different perspectives of researchers such as to be living in 'other worlds' and to possess 'mutually exclusive' beliefs (Wiever and Gioia, 1994). Hence, positivism/post-positivism and constructivism are restrained to their distinct philosophical views regarding ontological, epistemological and methodological aspects

(Creswell and Plano Clark, 2011). This leads to dividing research communities into camps rejecting opposite sides (Given, 2017). However, as Schultz and Hatch (1996) explained, they accept multi-paradigms but do not solely accept their integration by ignoring their differences, rather it is an interplay of paradigms respecting and acknowledging their differences. They further believed that the diverse application of paradigms may lead to a new form of understanding. In this line of thought researchers such as Given (2017) suggested it is time to commence thinking about a 'mixed paradigm'. According to Purchase (2018), applying new approaches to answering research questions and including a variety of new thoughts may lead to new developments within a research field. Furthermore, according to Creswell and Plano Clark (2011), the combination of paradigms may provide better results and reduce inconsistencies between the results. Furthermore, as Mason et al. (2010) argued, within tourism research, there are still themes that are not fully explored and, additionally, due to the long tradition of tourism studies tourist topics may also need a new perspective. Therefore, combining various paradigms may lead to a better understanding of the phenomena.

To overcome the challenges of using both interpretive and positivist paradigm this study followed the philosophical assumptions of pragmatism to combine both paradigms into a single study. This approach of mixing is supported by various authors suggesting pragmatism as a philosophy for combining interpretivism and positivist views (Biesta, 2010; Morgan, 2014; Creswell and Plano Clark, 2011; Khoo-lattimore et al., 2019; Teddlie and Tashakkori, 2009, Pansiri, 2005, 2006). It is important to note that mixing paradigms may also be achieved by other philosophical assumptions such as critical realism, dialectics or transformative paradigms (Shannon-Baker, 2016). However, as Khoo-Lattimore et al. (2019) identified within a tourism context and based on the proposed paradigms, so far, the philosophy of pragmatism has been applied in tourism (e.g. Pansiri, 2005, 2006; Hanna and Rowley, 2015).

This study applies VR within PA which is relatively new, and this area is not fully explored, especially within tourism. Therefore, combining paradigms may lead to a more holistic understanding of the research problem. Furthermore, especially within tourism, mixing paradigms is well established and accepted as the various studies demonstrated (Heimtun and Morgan, 2012; Correia et al., 2020; Kallmuenzer et al., 2019; French et al., 2017; Puhakka et al., 2014).

5.2.3. The Philosophy of Pragmatism

Pragmatism has been applied as a valid alternative philosophical stance (Biesta, 2010; Bryman, 2015; Denscombe, 2008, Morgan 2014;). According to Johnson et al., (2007, p. 125) ... pragmatism is a well-developed and attractive philosophy for integrating perspectives and approaches.' From a philosophic point of view, pragmatism is argued to be the 'third wave' or the 'the third research movement' (Johnson and Onwuegbuzie, 2004, p. 17). The focus on pragmatism offers an alternative way of moving away from the paradigm debate to a logical and practical alternative in doing research (Johnson and Onwuegbuzie, 2004). However, the author Biesta (2010) acknowledged the practical implications of using pragmatism but argues it cannot provide a philosophical foundation '...pragmatism should not be understood as a philosophical position among others, but rather as a set of philosophical tools that can be used to address problems...' (Biesta, 2010, p.97). Furthermore, Biesta (2010) stated that mixing ontologies might be problematic within pragmatism but shows that epistemology it can provide useful arguments. Other authors such as Creswell and Creswell (2018), Morgan (2007; 2014) or Kono (2018) argued the philosophy of pragmatism as an alternative research paradigm.

According to Baert (2005), knowledge in pragmatism is a form of action and free of ontological constraints. In particular, the assumptions about the nature of reality as well as epistemology are replaced by shifting focus to the importance of human experience (Morgan, 2014). In this respect, following Dewey, the experience was related to sources of our beliefs and to the meanings of our actions linked in a cycle affecting each other where beliefs are informed by our previous actions and the outcomes of actions inform our beliefs. Additionally, experience serves as a touch point between our beliefs and actions where meaning is created. Importantly, as Morgan (2014, p. 1048) described:

"On one hand, our experiences in the world are necessarily constrained by the nature of that world; on the other hand, our understanding of the world is inherently limited to our interpretations of our experiences. We are not free to believe anything we want about the world if we care about the consequences of acting on those beliefs.". Hence, according to Kono (2018), for Dewey the nature of reality was not something abstract, rather it is a transactional relationship between the researcher as an actor and the world. In addition, he accepted willingly the world as an external reality, which can be accessed through experience or with interaction in this world. More importantly, research is a type of experience of the world, starting with an uncertain situation and where habitual actions are not sufficient to provide a solution. Therefore, this unsolved situation is the starting point where the researcher identifies the problem, presents changes and formulate actions to provide a solution (Kono, 2018). Hence, as Patton (2002) argued, pragmatism does not follow a predefined research tradition because it aims to provide valuable and actionable answers within a real-world setting limited of time and resources. Further, any research decisions are dependent on the situation and opportunities within the given context. Therefore, methodological questions are partially based on the research aim of a study rather than being defined by ontological reasons (Baert, 2005).

According to Biesta (2010), one of the key contributions of Dewey is to offer a different view of the production of knowledge which in turn decides to choose between subjectivism or objectivism meaningless. In this argument, pragmatism acknowledges the existence and the importance of the natural world as well as the subjective world where language, culture and a person's views are embedded in the world. Hence, knowledge is constructed and based on the reality of the world that individuals experience (Johnson and Onwuegbuzie, 2004). This new philosophical perspective that pragmatism provides gives freedom to researchers, as Biesta (2010, p.21) described:

'This is tremendously liberating as it does away with an alleged hierarchy between different knowledges. Dewey thus shows that no knowledge can claim to provide us with a deeper, more real, or more true account of the world. Different knowledges are simply the result of different ways in which we engage with the world'.

The philosophy of pragmatism sees the world as an experiential world having various layers. These layers can be measured and observed by accessing them subjectively, objectively or with a mix of both aiming to research from different angles to produce knowledge (Yvonne Feilzer, 2010). Therefore, the philosophy of pragmatism offers

new arguments about ontological and epistemological assumptions not solely achieved by mixing the traditional paradigms, rather by formulating a coherent system of thought and therefore does not violate any other philosophical research traditions (Green and Hall, 2015).

Based on the purpose of this study and the research questions within a real-world setting a pragmatic approach was followed. Translating this into the inquiry process from a pragmatist perspective, this would relate to problem identification - the lack of PA theory in the VR context and its effects on tourists' attachment to the Lake District National Park. In this context, current beliefs and existing knowledge such as established theories did not provide satisfactory answers to the research questions of this study. PA theory combines people, places and process within one universe, which suggests the need for a pragmatic approach. The ontological consideration of this study includes the destination as a physical and material world existing where tourists are part of it, interacting with and connected to that place through a cognitive, affective and behavioural process. Hence, previous experience within that place leads to certain beliefs informing future actions such as returning to the destination or performing diverse activities at the destination. The need for action resulted by applying VR experience as a new type of experience and hence its interpretation aimed to generate future actions and to inform beliefs. Thus, to create new knowledge as a form of action that will be adopted.

5.3. Research Approach

According to Matthews and Ross (2010), the research approach is guided by the chosen paradigm within a study. Therefore, following interpretivism usually leads to an inductive approach while positivism is generally following a deductive approach. As Collis and Hussey (2021) argued, an inductive approach refers to theory building developed from empirical data and observations. In this respect, induction reflects the interpretation of participants regarding their environment (Saunders et al., 2018). Thus, to produce knowledge inductively, it is necessary to capture the views and opinions of people within a given setting to gain a better understanding of how they see the world (Neuman, 2013). Moreover, inductive reasoning also captures comprehension, feelings and choices (Schwartz-Shea and Yanow, 2013). Therefore, an inductive approach starts from the observable and moves to the general to generate theory by using qualitative research methods such as grounded theory, observations or

interviews (Bryman, 2015). The primary aim is to gain new insights and to generate new ideas which characterise inductive research as a form of explorative research (Saunders et al., 2016).

In contrast, the deductive approach refers to theory testing usually formulated in hypotheses, which is firstly driven by a theory and then followed by gathering data (Bryman, 2015). Therefore, deductive research involves the development of conceptual or theoretical frameworks which are then tested empirically (Matthew and Ross, 2014; Collis and Hussey, 2014). Moreover, the research phenomena to be studied is a subordinate of an existing context following certain kinds of rules. Hence, deductive reasoning does not reveal new ideas, rather it confirms the 'Truth' by approving the application of existing rules on a research phenomenon (Reichertz, 2014). Hence, the deductive approach commences with established theories and progresses to the particular, to the object of observation (Schwartz-Shea and Yanow, 2013).



Figure 5.2 Inductive and Deductive Relationship Source: Bryman (2015)

A third research approach is the concept of abduction (Saunders et al., 2019). According to Schwartz-Shea and Yanow (2013), abductive reasoning can be referred to as the cyclical movement between data and theory and therefore, does not follow a linear direction when compared to deductive and inductive. Furthermore, an abductive approach considers participants' interpretations and their meanings about their worldview but provides a theoretical foundation (Bryman, 2015). Beginning with empirical data within abduction, as Reichertz (2014) stated, is the starting process to

generate new ideas. In this respect, abduction can be defined as the collection of data in order to study a phenomenon or to explore new themes and patterns to generate a new or adjust an existing theory, which in turn, is again tested through gathering additional data (Saunders et al., 2016). Since this study followed pragmatism, according to Morgan (2007), the abductive approach, through the lens of traditional pragmatism, moves between inductive and deductive where observations are translated into theories and then evaluated. However, for Morgan (2007), the evaluation applies through action, meaning that the results of previous inductions need to be tested for their workability regarding their future behaviour. This type of definition describes best sequential designs where inductive data acquired through qualitative methods inform the deductive process of the quantitative method (Morgen, 2007).

Based on the discussion of the different approaches above, this study uses an abductive approach. Firstly, an interdisciplinary literature review of PA, VR and tourism has established the theoretical foundations of this study. This process aimed to build some theoretical knowledge about the research phenomena but was insufficient to propose a coherent theory how PA is affected in a VR setting. Therefore, after reviewing the literature there was a limited understanding which is reflected in the base model. These suggested relationships were used to have a basic starting point. This is turn should be the foundation for developing the first set of hypotheses. The second step led to gather data and to explore new themes and applying an inductive approach. Hereby the literature review served to identify important aspects to develop the interview questions to explore meanings and perceptions of tourists. The results obtained from the qualitative stage was examined and reflected with the literature and shaped further theory development and the suggestions of hypotheses. The third step included to test the proposed theory and final results were explained through existing theory but involved also new findings and suggestions for theory development.

The new findings were integrated with an existing theoretical framework. In order to test the framework and to evaluate its workability new additional data were collected to test the model through a survey – a deductive approach.

5.4. Research Strategy

A research strategy defines the plan of how a researcher is going to answer the research question (Saunders et al., 2016). In this regard, based on a given research

approach there are many different ways how to conduct a study. For example, various authors have identified several strategies such as narrative research, case studies, grounded theory, action research (Creswell et al., 2007), experiment, survey, archival documentary research (Saunders et al., 2016) or ethnography (Silverman, 2011). The following table 5.3 provides a sample of research strategies with their key characteristics.

Research Strategy	Key Characteristics
Experiment	Testing hypotheses between groups which may be divided between experimental group and control group confirm differences between groups. Applied in exploratory and explanatory research. Testing theory and identifying causal relationships. Conducted in a laboratory or real setting
Survey	In general, applied in deductive research. Applied in exploratory and descriptive research. A standardised collection of quantitative data such as using questionnaires. Data is used to generate and analyse data using statistics. Data is collected by applying large data sets.
Archival and	Analysing archived data retrieved from all kinds of sources. Increased scope
Documentary	of research through digitalisation and access to online archives. Analysing of data such as social media, records, diaries, contracts, policies,
Research	government sources, reports as well as on- and offline documents. Furthermore, data may also be in visual or sound files; Secondary research since data has been created for other purposes. Data can be either quantitative or qualitative.
Case Study	Researching phenomena within a real setting. A case study may also involve a person, organisation, event etc. Applying qualitative or quantitative research. A case study may either be a single or multiple case study. A single case study may provide in-depth knowledge of research phenomena. A case study may also be considered holistically focusing on phenomenon or embedded involve different layers of the research object.
Ethnography	Exploring the cultural or social world of a group. Applied in qualitative research. The researcher observes and studies people behaviour. The researcher becomes part of the studies group to get a better understanding of participants.
Grounded Theory	The overall aim is to develop theories based on empirical data on human behaviour. Researchers usually do not have prior knowledge when conducting grounded theory. Data analysis is an ongoing process where data is collected and analysed simultaneously. Inductive research approach. Theoretical sampling is applied.
Narrative Inquiry	A story that interprets an event or multiple events. Research focuses on how people create meaning through narratives such as in notes, interviews, discussion panels, books etc.
Action Research	Knowledge as a form of power. Applied research where the primary goal is to assist social change or bring a value-oriented political-social goal. The emergent and iterative process of research is designed to work out solutions to real organisational problems through a participative and collaborative approach.

 Table 5.3 Overview of different Research Strategies

Source: Saunders et al. (2016); Neumann (2013); Charmaz and Bryant (2011); Yin (2012); Urquhart (2013) and Hannigan (2014).

Based on the different research strategies this research applied the case study as the best strategy to answer the research questions.

5.4.1. Single-Case Study Research

According to Yin (2014) case study research can be defined as in-depth research on a real-world phenomenon with fluid boundaries between phenomena and context. Case study research depends on various sources of data and existing theoretical concepts which guides the research (Yin, 2014). Defining a case study is not simple and involves many different aspects. Depending on the research field a different focus will be apparent in the research. For example, in political science, the unit of interest might be a state or nation, while in psychology or medicine the individual is the primal focus (Gerring, 2007). Hence, case study research is context-specific and may vary depending on the research purpose.

According to Yin (2014), case study research allows to explore a research phenomenon in a real-world context and may provide a complete understanding of a research problem. Case study research can be either descriptive (Elman et al., 2016), explorative or explanatory research or a combination of both (Yin, 2014). Hence, case studies support positivistic and interpretivist research, and therefore, data can be either qualitative, quantitative or in case of multiple data sets both. Further, case study research can be considered to be very effective in exploratory research and hence to be used to develop theory (Gerring, 2007, Eisenhardt, 1989). According to Eisenhardt and Graebner (2007, p.25) a key reason for the popularity and relevance of using case studies for inductive research '…is one of the best (if not the best) of the bridges from rich qualitative evidence to mainstream deductive research' (p.25). Moreover, case studies focus on building constructs and measures and thus allow to the creation of new theory from data and subsequently to be tested. Hence it closes the inductive deductive cycle and generates accurate, interesting and testable theory (Eisenhardt and Graebner, 2007).

Case studies can also be used in a quantitative manner using statistical methods (Elman et al., 2016; Herron and Quinn, 2016; Seawright and Gerring, 2008) and hence, explain the case study. In this line, case studies are more effective trying to answer questions such as 'what', 'how' and 'why' (Saunders et al., 2012). Moreover, Yin (2014)

distinguished between a single- and multiple-case study. The former focuses on one case, while the latter relates to two or more cases. Furthermore, variations relate to embedded cases within single- and multiple-case design.

The discussion about the number of cases needed can be controversial and can depend on the purpose of the research. An overview of strengths and weaknesses between single and multiple case study(ies) is given in table 5.4:

Turne of Coop	Strongth	Weeknees
Type of Case	Strength	weakness
Study		
Single Case Study	In-depth research of a case	Limited value in generalisation of findings
	Detailed and intensive analysis	Findings may not be comparable to other cases
	Less complicated	
	The chosen case might represent a great opportunity to study something unique	
Multiply Case Study	External validity through a variety of cases	More resources needed
	Findings may be generalizable and more robust	Less depth for each selected case
	More accurate findings	Rational need to identify cases
	Creation of more robust theory building through multiply cases	Time-consuming

Table 5.4 Strength and Weakness of Single vs Multiple Case Study(ies)

Sources: Own adopted by Yin (2014), Saunders et al. (2012), Bryman (2015), Voss et al. (2002), Gerring, 2007) Eisenhardt (1989)

In this respect, according to Gerring (2007), a single case study can be researched more in-depth including (Bryman, 2015) as a detailed and intensive analysis of a single research phenomenon. A single case study can be about a single community, school, organisation or event and allow for an intensive focus on the case. However, as shown by Voss et al. (2002), single case studies may be seen in a more critical way such as limiting the generalisation of findings or the degree of representativeness of the case. Therefore, multiple case studies produce more robust, generalizable and testable theories than a single case (Eisenhardt and Graebner, 2007). However, there is also a strong rationale for using single case study research. According to Yin (2014), there are five reasons why choosing a single case study as presented in table 5.5.

Table 5.5 Reasons for using Single Case Studies

Reason	Description
Critical	Case is critical to theory and thus a single case study may confirm or provide alternative explanation of the proposition made by the theory
Extreme	A single case might be extreme or unusual and shows to be different from others
Common	A single case that represents a common event which is occurring in an everyday situation
Revelatory	A single case where researcher got access to and gives an opportunity to research the case, while being not accessible in the past.
Longitudinal	Studying the same case over a period of time and analyse changes.

Source: Yin (2014).

Following the justifications provided by Yin (2014), this study applied a single case study approach. According to Flyvbjerg (2006), a single case can be either perceived negatively or positively. Saunders et al. (2012) stated that a single case study is often used when the case refers to a critical, alternatively, extreme or a unique case. In this study, the Lake District National Park may be classified as a unique tourist destination. In this sense, the uniqueness relates to its beautiful physical landscape or as described by Walton (2013, p. 31) '... an outstandingly beautiful area..' that 'has inspired and attracted writers, artists, scientists, political commentators and tourists for 250 years, and continues to be seen as a spiritual heartland for many visitors from the UK and further aield' (Denyer, 2013, p. 3). Hence, it possesses a high cultural, emotional and national value for domestic tourists (e.g. Jepson and Sharpley, 2015). Furthermore, to underline the special meaning of the Lake District as a tourist destination it is important to note, that it has been awarded as a UNESCO World Heritage Site in 2017 (Lake District, 2021). Therefore, focusing on the Lake District as a single case study was argued to provide the best setting to answer the research questions of this study.

5.4.2. Single Case Study - The Lake District National Park

The literature shows, that single case studies are common in tourism and PA research. Tourism studies such as of Page et al. (2017), followed a single case study approach arguing to focus in-depth by describing the unique and innovative tourist development to their research purpose. Likewise, within tourism but in a VR context, tom Dieck et al. (2018) used also a single case study to gain an in-depth view of tourists' VR experiences at the Lake District National Park. Besides tourism, this study draws its main theoretical background from PA theory. PA studies also place the research focus on geographical areas. In this respect, PA studies need to frame the context of their research since PA combines people and places, and people's experiences are bounded within the place. For instance, studies such as from Youngs (2017) explored PA in Grand Teton Nation Park, in Adirondack High peaks (Olstad, 2017) or the Lake District (Jepson and Sharpley, 2015). Hence, these various examples may be identified as a single case study research design similar to this study. Therefore, the tourist destination Lake District National Park represented a real-world setting and provided a great opportunity to explore VR and the VR experience of tourists. Furthermore, since the application of VR within PA is new in tourism, the focus of the Lake District as a single case study is believed to provide unique knowledge and insights rather than focusing on more than one destination. Additionally, it is believed that concentrating on the Lake District National Park allows researching domestic tourists' attachment to the place holistically mediated by VR in more detail since tourists' link is geographically bounded within the Lake District and refers to how people perceive and interpret their experience in this place.

Another reason for choosing a single-case study design is the fact that multiple case studies need more resources such as time and money, and are more complex and thus, more resource-consuming. This is especially true when applying mixed methods (Yin, 2012). Moreover, the existing VR application is designed for the Lake District and hence, examining other national parks would require a similar VR application to compare results among multiple cases. Furthermore, through past collaboration with Manchester Metropolitan University, there was easier access to that destination and getting support from the Lake District authorities. Taking all these aspects into account and given the limited time frame for this doctoral research, a single case study seems justified and fitting. Hence, choosing the Lake District National Park as a case study was based on the accessibility to the destination as a researcher, an important market for repeat domestic tourists as part of the sample, a popular rural destination with tangible and intangible values for conducting research on PA and available resources to undertake this research.

5.5. Mixed Methods Approach

The choice of method is informed by the chosen research paradigm such as being informed by positivism or interpretivism. In this respect, methods of collecting data are drawn from both quantitative and qualitative paradigms (Creswell and Creswell, 2018). Moreover, according to Maxwell and Loomis (2003), the specific application of

quantitative and qualitative methods in a single study is known as mixed methods research that has gained popularity in several disciplines. In this line, mixed-method research has also been described as the third methodological movement by combining interpretive and positivist approaches into a single study (Teddlie and Tashakkori, 2009). This also determines the procedure and assumptions of the study and besides data collection, also analysis and interpretation (Johnson et al., 2007).

Furthermore, according to Schoonenboom and Johnson (2017), mixed methods is composed of at least a qualitative and quantitative method to address the research question. However, as shown in figure 5.3, based on the type of mixed-method research it can be either considered as equally applied between qualitative and quantitative research, or, in case of a dominant paradigm identified as qualitative or quantitative dominant (Johnson et al., 2007).



Figure 5.3 The three Major Research Paradigms

Source: Johnson et al. (2007)

Furthermore, Teddlie and Tashakkori (2009) presented key characteristics for mixed methods as summarised in table 5.6.

Table 5.6 Contemporary characteristics of Mixed Method Research

Characteristics	Meaning
Methodological Eclecticism	Free to combine methods (Qualitative and Quantitative)
Paradigm Pluralism	To apply various paradigms
Diversity	To apply a range of tools to investigate confirmatory or exploratory questions
Emphasis on continua	To use different methods and analysis rather than to focus on one
Cyclical approach	To move between an inductive and deductive approach
Focus on research question	To determine the best method(s) to answer the research question or problem

Set of basic 'signature' research design and	Determination of design such as being sequential	
analytical process	designs or as independent process	
Tendency toward balance and compromise that	Balancing of qualitative and quantitative and aiming a	
is implicit within the 'third methodological	unique mixed method identity	
community'		
Source: Adopted from Toddlig and Toshakkari (2000)		

Source: Adapted from Teddlie and Tashakkori (2009)

Furthermore, the general aim of a mixed-method design study is to strengthen and increase the validity by combining the strength of a quantitative and quality design (Teddlie and Tashakkori, 2009). Yet, as Johnson and Onwuegbuzie (2004) stated, quantitative and qualitative methods may have their advantages and disadvantages and may produce different practical outcomes. The decision to choose between quantitative or qualitative might be more appropriate in certain situations. However, mixing approaches is argued to provide a more feasible solution, and to produce a superior result compared to the focus on a single method (Johnson and Onwuegbuzie, 2004). A more comprehensive list of arguments for and against using mixed methods is shown in table 5.7:

Strengths/Arguments for Mixed Method Research	Weakness/Arguments against Mixed Method Research
Qualitative data may add meaning to quantitative data and vice versa	Difficult to carry out if research methods are carried out simultaneously
Combining the strengths of both quantitative and qualitative methods	Greater understanding of various methods to carry out the research
Methods inform each other to produce a more comprehensive picture of the problem	Argument of staying within a single paradigm since conflicting assumptions about ontological and epistemological concerns
Generating and testing theory	More time demanding and costly
Weak methods may be compensated by using an additional method	There might be still problems by mixing paradigms that need to be worked out such as how to analyse data and how to report conflicting results
Stronger conclusion of evidence through convergence and corroboration of findings	
May provide a better understanding of the research problem	
Diversity of views towards a research problem	
Findings from one method may be confirmed by the second method	
May increase the generalisability of results	

Table 5.7 Arguments for and against using Mixed Method research

Source: Own adopted by, Johnson and Onwuegbuzie (2004), Bryman (2015), Saunders et al. (2016)

Applying mixed methods might be viewed critically since it combines different paradigms, however, the various reason exists for conducting mixed methods. For

instance, according to Mertens (2016), mixed methods research is important to solve 'wicked problems' referring to complex problems that require new and innovative solutions. In this respect, mixed methods can combine multidisciplinary research to provide new opportunities to solve complex research questions. Furthermore, as Bazeley (2018) argued, mixed-method research is applied to engage with the complexity of problems within a real-world setting and provide various approaches from different perspectives. Following the pragmatic approach by focusing on a workable solution and thus answering the research question adequately this study considered applying more than one method.

5.5.1. Mixed Methods in Tourism and PA

The use of mixed methods to utilise the strengths of quantitative and qualitative methods is also evident in tourism and PA studies. Within tourism, as Khoo-Lattimore et al. (2019) argued, applying mixed methods is not new and is more commonly used. For instance, Correira et al. (2019), used convergent parallel mixed methods to explore how tourists attach meanings to luxury-based tourism experiences by using open-ended and closed questionnaires. Another study by Hanna and Rowley (2015) used sequential mixed methods to investigate place brands by conducting interviews and web content analysis. Moreover, McKercher et al. (2014), applied semi-structured interviews and questionnaires to study the effects of climate change among travel agencies. Hence, mixed methods in tourism are evidently and based on research contexts various quantitative and qualitative methods are applied to answer complex research questions.

The application of mixed methods can also be evidenced in PA studies, where mixedmethod studies exist and may provide a better understanding of people's relationship to places. In this context, Lewicka (2011, p. 221) argued, 'Undoubtedly a clever combination of quantitative and qualitative measures offers the most profound insight into people's relations with meaningful places'. In general, as demonstrated by Smith (2017), to capture the individual individuality within a place the subjective experience needs to be captured. Therefore, PA studies may use surveys, interviews and focus groups to provide a solution. While surveys relate to more quantifiable results, interviews and focus groups try to get a deeper meaning of people-place relationships (Smith, 2017).
In this respect, Lin and Lockwood (2014), explored place meanings by using interviews and guestionnaires such as identifying the existence of emotional and functional attachment and confirmed the relative strength by using a survey method. Similar, Ryan (2009), used firstly interviews to get a deeper understanding of people's attachment and meaning about the place and secondly, informed by the interviews, applied a questionnaire to quantify the relationship between the identified dimensions. A slightly different approach was chosen by Abbott-Chapman et al. (2014) using focus groups and questionnaires to explore the feelings and belongings of families in rural areas. Thus, as demonstrated by the tourism and place attachment literature, different combined methods are possible depending on the aim of the research. Based on the research aim of this study interviews were needed to identify new themes of tourists' VR experience and in relation with existing literature to propose a theoretical PA framework. The quantitative part used self-reported surveys aimed to validate and explain the relationships of interactions between VR experience and tourists PA. Therefore, it is believed that the most appropriate choice of methods for this study is mixed methods.

5.6. Research design

According to Saunders et al. (2012), the research design can be described as a plan of how a study is going to answer the research question. In this respect, the research design should specify the data collection process, sampling, data analysis as well as address ethical issues. Moreover, it demonstrates how a study has been executed by considering the theoretical concepts (Smith, 2000). A research design can be categorised into quantitative, qualitative or mixed-method design (Saunders et al., 2018). Since this study applied mixed methods, Creswell and Plano Clark (2011) presented four main mixed-method research designs which can be considered as shown in figure 5.4:





Figure 5.4 Main Mixed Method Research Design

Source: Creswell and Plano Clark (2010).

Therefore, to fulfil the research aim of this study, a sequential exploratory mixed method design was followed commencing by a qualitative method informing the quantitative design. To propose a new framework, it was essential to investigate the effect of VR experiences on tourists and how these new experiences may influence their current tourist experience, perceptions and therefore to tourists' attachment. The results informed the quantitative stage to validate the proposed theoretical model quantitatively. The following figure 5.5 presents an overview of the study's chosen design for this study.



Source: Author

In addition, the primary research stages included a VR experience for all participants. For this purpose, the BirdHive 360 VR application was used. The content of the VR application was showing different places within the Lake District National Park. The duration of the VR experience was around 3 minutes and 40 seconds. During that period, the user experienced a 360-degree video with sound effects of birds which was filmed by a constant flying drone. Hereby participants were able to move their head and able to look in all direction. The beginning scene starts at the Honister Pass showing a valley and several mountains and hills. The next scene shows Buttermere which is a region with a lake surrounded by hills, forests and larger areas of green fields. The following part focuses on a small rural town named Grasmere. This little town is located next to a lake which is surrounded by forest, green fields and smaller and higher hills. The last part of the VR experience highlights an area of Tarn Hows. The main focus is a forest while hills and green fields can be observed in the background. Overall, the VR experience captured important characteristics of what constitutes rural places. In particular, as identified in the literature review on landscape values and preferences, landscape elements such as water, forests or mountains were aesthetically preferred by people. In this context, the VR experience showed essential parts of the landscapes of the Lake District that contributes to a positive tourist experience in terms of its natural beauty and place benefits. In addition, it could be argued that the VR application represented the positive imagination of a rural idyll that was important for rural tourism. Consequently, the VR application captured essential landscape characteristics that are identified in the literature and shape the research context to answer the aim of this study.

5.7. Quality issues in the data collection phases

Since data collection is divided between qualitative and quantitative quality potential issues may occur for each type of data. Therefore, this section discusses firstly the data quality of qualitative data and secondly, the quality concerns of quantitative data.

5.7.1. Qualitative data collection: phase one interviews

According to Leung (2015), a general agreement on how to evaluate qualitative studies does not exist. Therefore, qualitative research follows a diverse approach compared to quantitative research and hence applying the same concepts of quality might be inappropriate in qualitative research (Lewis et al., 2003). In this respect, according to

Dixon-Woods et al. (2004), there is a controversy about quality to qualitative studies, including the need for the general existence of quality criteria in qualitative research. This controversy, according to Bryman (2015), is due to the fact of the existence of multiple realities within the interpretive paradigm a single measured truth does not exist unlike the quantitative concepts of validity and reliability. Thus, participants provide their view of reality based on their values, beliefs and experience and researchers are part of the enquiry process to achieve a better understanding of the phenomenon (Morse, 1991). However, as Morse et al (2002) argued, without any rigour research is meaningless and hence, applying measurements to assess the quality of studies is important.

In general, as identified by Saunders et al. (2018), there are three types of approaches when evaluating the rigour of a qualitative study. The first adopts the concept of validity and reliability in qualitative studies. In this line of reasoning, as argued by Bryman (2015), researchers refer to reliability and validity in qualitative studies but add a slightly different meaning to that of quantitative researchers. In this respect, according to Carcary (2009), validity refers to the demonstration of the research design and how accurate the research question has been identified and described and therefore, adds to the credibility of the study. Further, reliability in qualitative studies refers to the ability to produce similar results under comparable settings (Carcary, 2009).

The second approach involves researchers utilising different concepts similar to reliability and validity (Saunders et al., 2018). In this respect, Lincoln and Guba (1985) referred to the trustworthiness of a study considering four criteria such as credibility, transferability, dependability and confirmability. In this case, dependability refers to the reliability, credibility to internal validity, transferability to external validity (Saunders et al., 2018) and lastly, confirmability to objectivity (Bryman, 2015). In this respect, dependability includes keeping records of research steps such as formulating a research problem, choice of participants, notes, interview transcripts and selecting of analysis methods (Bryman, 2015). Thus, dependability is demonstrating the robustness of the study such as the quality of the data and its interpretation and shows the reader the research process (Lewis et al., 2003). Credibility includes the demonstration of principles of good research practice and the presentation of research findings to participants to receive confirmation about the researchers' interpretations of their views (Bryman, 2015). In this respect, credibility can be achieved by creating

trust with participants, using multiple methods of data collection, peer review of the research process, reducing responses bias, and external audits (Creswell, 2014).

Transferability relates to external validity and hence to the generalisability of findings to other settings. In this respect, important aspects include describing the research question, research design and context and the interpretations of findings (Saunders et al., 2018), hence demonstrating how convincing the study is with the chosen method to the research problem including the analysis process and the researcher's interpretations of data (Carcary, 2009). To provide sufficient information, a thick description of the research setting and participants enables other researchers to make decisions if the findings of the current study are transferable to other study settings (Creswell, 2014). The last aspect, confirmability acknowledges the degree of subjectivity in qualitative studies and involves the researcher's role. In this respect, it requires the researcher to be acting in good faith showing that no personal values or theoretical tendency influenced the conduct of research or findings (Bryman, 2015). However, as argued by Morse et al. (2002), this aspect may not apply to all qualitative studies such as phenomenology since data is part of the researcher's experience within the research process.

The third approach sees researchers develop new concepts for evaluating qualitative studies (Saunders et al., 2018). For instance, Guba and Lincoln (1989), proposed an extension of the existing trustworthy criteria, authenticity, to assess a qualitative study. Moreover, Morse (2018) presented validation and verification strategies to ensure data quality and Newton et al. (2012) argued for more reflexivity in quality studies. Furthermore, Richardson and St. Pierre (2017), consider a substantive contribution, aesthetic merit, reflexivity and impact as useful criteria for social scientific publication. Dixon-Woods et al. (2004), referred to a more methodological approach of quality by formulating questions relating to the suitability of research questions, description of sampling, data collection and analysis and if it is appropriate to the research questions. Moreover, the amount of evidence is important for made claims. Important aspects include if results and data are integrated and if the qualitative study makes a valuable contribution. Hence, a number of qualitative researchers proposed various approaches to evaluate the rigour of studies.

In this sense, the choice of the research design and methods are part of the quality process to establish trustworthiness. Therefore, describing the research process

allows other researchers to follow each step and to assess the made choices. This includes the research instrument, the sample, analysis technique and also showing quotations of participants contribute to the credibility of qualitative results. Hence, it can be argued that the methodology of this research is part of the quality assessment by demonstrating how the research was carried out.

The analysis of the interviews was divided into two parts. The first part of the analysis was asked before the VR trial to receive information about participants' attachment to the Lake District. Since repeated tourists were considered as the sample it was necessary to figure out what people think about the place and if they show any attachment to the Lake District National Park (LDNP). Furthermore, the pre-questions were also useful for further discussion to identify any changes that could be made from using the VR application. The interviews took place in Bowness/Windermere.

5.7.2. Quantitative data collection – phase two Questionnaire

According to Newman et al (1998), when collecting quantitative data validity and reliability are the two primary concerns of every research. Consequently, a lack of documentation may lead to reduced trustworthiness of the study. However, it should also be kept in mind that validity is not an actual measure, rather it is an estimate (Newman et al., 1998). Hence, it is impossible to achieve 100 per cent validity and consequently, quantitative research possesses always a measurement error (Cohen et al., 2000). Likewise, reliability estimates may range from 0 to 1 and thus showing a higher or lower level of reliability level (Kimberlin and Winterstein, 2008). Furthermore, if validity is achieved in the study reliability is implicit, whereas reliability can be established without having validity (Newman et al., 1998). According to Cohen et al. (2000), validity can be established through careful sampling, appropriate instrument design and appropriate statistical analysis. According to Heale and Twycross (2015), validity can be described as how accurately a concept was measured in a study. Furthermore, a common distinction is made between internal and external validity. Within internal validity, the focus lies on the ability of the questionnaire to measure what it is supposed to measure. Moreover, three aspects of internal validity can be considered, namely, content validity, construct validity and criterion validity as shown in table 5.8. Regarding external validity, the main question refers to the generalisability of findings to other settings (Saunders et al., 2018).

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Type of validity	Description
Content validity	To what extent a research instrument precisely measures all aspects of a construct. Can be improved through careful literature review or using panels to evaluate questions. Further, it depends on academic expertise in a research field.
Construct validity	To what extent a research tool measures the intended construct. It indicates how well a set of sub-questions measure a specific construct. Variables have to be theory-driven and therefore, false theoretical conceptualisations about the relationships will invalidate the measure. To measure construct validity statistical tests can be applied. Failing to establish construct validity may lead to the wrong conclusions.
Criterion validity	The extent to which a research instrument is related to other instruments measuring the same variables. Key aspects include how well the sets of measures correlate with each other when they should be related theoretically. To measure criterion validity various statistical tests can be applied.

Source: Saunders et al. (2016, 2018), Kimberlin and Winterstein (2008), Newman et al. (1998), Westen and Rosenthal (2003), John and Benet-Martínez (2000) Doty and Glick (1998); Bryman (2016); Román-González et al. (2017).

According to Altinay et al. (2015) to enhance internal validity research findings can be compared with the literature, especially since, as argued by Eisenhardt (1989), when building theory from a case study comparing findings with contradictory literature sharpens construct definition. Furthermore, according to Altinay et al. (2015), discussing research findings in public may also lead to a validation of the study's results since other researchers may review findings.

Unlike internal validity which is concerned about the instrument and what it is supposed to measure, external validity refers more to the generalisation of research findings (Altinay et al., 2015). This is according to Bryman (2016) one of the main concerns in quantitative findings and it is based on the representative of the sample. Furthermore, external validity refers to how well research findings can be transferred to another setting with a different sample and research process. In this respect, external validity may include the robustness of research and if it can be replicated within a different context (Reis and Judd, 2000). This also includes the type of participants and also the time when the study was executed (Creswell and Creswell, 2018).

Reliability in quantitative research is referred to the consistency of a measure over time (Heale and Twycross, 2015). Thus, reliability scores indicate the degree of reproduction of the measurement (John and Benet-Martínez, 2000) showing how reliable the applied instrument is to repeat the same results (Creswell and Creswell, 2018). As shown in table 5.9 there are three types of reliability:

Table 5.9 Types of Reliability

Type of reliability	Description
Homogeneity	The extent to which all items on a scale are measuring the same construct.
	Can be calculated by Cronbach's alpha producing a coefficient ranging from 0
	to 1 where 0 refers to no internal reliability and 1 as perfect internal reliability.
	Mostly used in social science which can be obtained from questionnaires with
	Likert-type questions aiming to provide a composite score.
Stability	The consistency of results when repeating the testing with the same
	instrument. Higher correlation between the measures would indicate higher
	reliability, however participants may alter their response at a different point of
	time and difficult to convince to fulfil the questionnaire twice.
Equivalence	Consistency of responses among multiple users of an instrument or among
	alternate forms of an instrument. The inter-rater reliability including the degree
	of agreement between two or more observers about the measurement
	considering the relevance of each item. Higher inter-rater reliability is
	achieved when the scores of the observers are consistent.

Source: Heale and Twycross (2015), Bryman (2016), John and Benet-Martínez (2000), Saunders et al. (2016), Kimberlin and Weinstein (2008) and Leech et al. (2009).

The design of this questionnaire was developed through a literature review and the qualitative research stage. Hence, both instrument designs were partially developed by reviewing existing literature and therefore possessed a higher degree of validity and reliability since questions have been used in previous studies by various authors. On the other hand, part of the questionnaire was developed through interviews including adjusted measurement from existing literature. Thus, new variables were proposed as new in the VR context of the PA literature. Likewise, interview questions were developed to cover important aspects of PA theory but within the VR context which was new for PA. In this respect, according to Schaffer and Riordan (2003), validity and reliability might be problematic when research is developing a new research instrument. However, to mitigate the problem the pilot studies revealed useful information such as the data quality of the interview questions or expected reliability scores. In both cases, potential weak points were changed before the actual data collection happened. Consequently, it can be argued that the validity and reliability of this exploratory study are low due to newly developed concepts and also limited VR research to compare results with existing literature.

5.7.2.1. Common Method Bias

According to Podsakoff et al. (2003), common Method Bias (CMB) was one of the key sources of measurement error impacting the validity of a study and the interpretation of relationships between measures. This might be specifically a problem with self-

reported surveys, due to the fact of a higher subjectivity of participants' judgement and other sources that might increase error variance (Kimberlin and Winterstein, 2008). In this respect, Podsakoff and Organ (1986) argued that self-reported instruments provide 'soft' data and possess various problems such as 'common method variance' (CMV) which can be defined as causing covariance between distinctive variables due to a participant's response coming from the same source. Moreover, according to Fuller et al. (2016), CMV results when responses show the systematic variation of a common scaling approach. Consequently, the relationship between constructs can be either inflated or attenuated (Rönkkö and Ylitalo, 2011) and hence, leading to a distortion of results which may pose a threat to empirical studies (Williams et al. (2010). This might be problematic, as Burton-Jones (2009) argued, ignoring CMB may lead to accepting poor theories and rejecting good ones and creating a false sense of the validity of the study.

Despite the concerns about CMB, there is a debate about the presence of CMV and its effect on the validity of a study (Malhotra et al., 2006). For instance, according to Podsakoff et al. (2012), results obtained from meta-studies showed that common method bias may account between 18 and 32 % of the variance and according to Malhotra et al. (2006), CMV is accounted for by 10 % and 18 % (Lance et al., 2010). In this respect, Fuller et al. (2016) argued, CMV can exist at a high-level before CMB appears. In this regard, little agreement exists about CMV under which conditions does CMV invalidates the results and therefore may cause confusion how to report and interpret results in studies (Richardson et al., 2009; Siemsen et al., 2010). On one hand, researchers argued to take any action to control for it (Podsakoff et al., 2003). On the other hand, other authors such as Lindell and Whitney (2001) referred to CMV as being overstated or an 'Urban legend' (Spector, 2006).

Spector (2006) proposed to not accept that CMV produces systematic variances based on a particular method, rather identify potential biases and try to control them. In this line, many authors agree to plan research more carefully and to minimise biases (Schmitt, 1994, Spector, 2006, Podsakoff et al. (2012). Moreover, as the literature showed consideration about CMV and biases are discussed among different disciplines such as organizational behaviour (Schmitt, 1994; Simmering et al., 2015), psychology (Podsakoff et al. 2012, Lindell and Whitney, 2001), Marketing (Baumgartner and Weijters, 2012), Business research (Fuller et al., 2016) or Information Systems (Malhotra et al., 2006). Recently, also tourism-related studies are concerned about CMB. For instance, according to Min et al. (2016), approximately 70 % of survey-related studies in 2015 within hospitality research did not address any measurements to control CMV. Similar, Yüksel (2017) explored response bias in nine leading tourism journals examining over 10,000 published articles. The results showed a small number of articles mentioning biases as a limitation, and in particular to CMB, solely 153 out of 10.032 articles discussed CMB. Moreover, the lack of discussing biases involves not only authors but also editorial policies that do not encourage authors to mention biases in their study and hence, the validity of tourism research may be affected considering the generalisability of results (Yüksel, 2017). Despite the various perspectives on CMB a substantial amount of research exists dealing with CMB and hence, it is important to be considered within research (Huang et al., 2019) Despite the absence of agreement on the efficacy of CMB in studies this research considered to follow the recommendations to apply methodological steps to reduce biases.

5.8. Applied Quality in this Study

This study applied several validity and reliability measures to minimise potential threats for the study. In addition, several common method bias procedures were applied.

5.8.1. Validity and Reliability

The first step of demonstrating how validity and reliability were established according to the previous sub-heading the research design of this study provided the rationale of applied methods, the choice of the research setting, the sample as well as how data was analysed. In this respect, showing how each research stage were carried out allowing to follow each step of this study and thus establishing a certain degree of trustworthiness. Further measurements to minimise threats to validity and reliability following steps for both research stages were applied as proposed by Saunders et al. (2018) and presented in table 5.10.

Threats to	Definition	Phase two:	Phase one:
internal validity		Questionnaire survey	Interviews
Past or recent	An event that may have	In this study no event	There were no
events	changed participant's	occurred that could have	events that might
	perception and consequently	changed participants	have altered
	may impact their response. For	response.	

	instance, the purpose of a study might influence behaviour and hence participants' responses.		participants' perception.
Testing	The impact of testing on participant's view or action. When participants are informed about a research project, they may change their behaviour or responses if they believe the research may have consequences for them.	This study informed participants about the research purpose and additional questions have been answered truthfully. However, there are no consequences for participants and therefore believed to have no impact on participants responses.	The participants were informed of the purpose of the study. Since no consequences were present for tourists it is believed that participants were not encouraged to alter their responses or their behaviour. However, an argument could be made that participants were new to VR and might have felt uncomfortable.
Threats to internal validity	Definition	Phase two: Questionnaire survey	Phase one: Interviews
Instrumentation	The impact when changing a research instrument during the research stages. This might have an impact on the comparability of results.	No changes were made during the research stage. Each participant received the same questionnaire.	No instrument was changed during the interview phase. All tourists were asked the same questions but with changing question order and prompts based on the dynamic interview between researcher and interviewee.
Mortality	The impact of participants withdrawing from studies such as being promoted or leaving their job during the research process.	Participants could withdraw at any time during the research stage. None of the participants wished to withdraw from the study.	Every participant had the opportunity to withdraw at any time. No participant took its right to stop the interview.
Maturation	The impact of a change in participants outside of the researcher's control. For instance, participants may change their attitude, behaviour or alter their responses due to management training.	The questionnaires were distributed and collected afterwards participants fulfilled them. Therefore, it is argued that no impact from outside had any effect on participants.	The interviews took place at same days and therefore, no change was possible that was outside of the researcher's control.
Ambiguity about causal direction	Lack of clarity between cause and effect. For example, during a study, it was difficult to say if poor performance ratings were caused by negative attitudes to appraisal or if negative attitudes to appraisal were caused by poor performance ratings	The questionnaire captured participants' perception and VR experience. An argument could be made about informing participants about the purpose of the study. However, the information was not detailed enough that they could establish cause	Participants were asked about their VR experience and perception after they had tried VR. There was no cause and effect

and effect of their responses Furthermore	
questions were randomised.	

Adopted: Saunders et al. (2018).

Table 5.11. presented a number of potential threats to validity and how they have been considered in both research stages. A list of potential threats to reliability is provided by Saunders et al. (2018) as shown in table 5.23:

Table 5.11	Threats to	Reliability
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Threats to	Definition	Phase two: Questionnaire	Phase one: Interviews
Participant error	Any factor which adversely alters the way in which a participant performs. For instance, asking participants to complete a questionnaire before lunch break.	The questionnaire was distributed at a place where tourists have a break and sitting on benches. Hence, they had enough time to complete the questionnaire without any time pressure. In other case, where tourists were waiting for others or taking a boat trip, a realistic time estimate was given before they start.	The interviews took place while tourists were sitting on the bench. Similar to the quantitative stage participants were informed about the approximate expecting length before commencing with the interviews.
Participant bias	Factors that causes a false response such as conducting an interview outside which may lead to falsely positive answers where they fear they are being overheard.	The questionnaires were conducted outside and on busy hours many tourists were present. To minimise external effects participants were chosen where there was enough space between other tourists. This ensured to use the VR headset freely without being afraid to disturb other tourists.	The interviews took place outside. To ensure the comfortability of tourists it was ensured that tourists were sitting alone and without having other tourists sitting or standing next to them.
Researcher error	Factors that may change the researcher's interpretation. For instance, researcher may be tired or not well prepared and therefore may misinterpret some of the subtle meanings of the participants' interviews.	Each participant had the opportunity to read the questionnaire before starting with it. Furthermore, it was explained what the VR experience looks like.	Before starting the interview, participants received an information sheet and it was been verbally explained what type of questions were being asked. However, a possible threat from researcher site was given to miss a meaning or interpretation since tourists were speaking different dialects and might have led to misunderstanding.
Researcher bias	Factors which lead to the recording of responses. For instance, a researcher's subjective view or disposition may have an impact on recording or interpreting participants' responses.	The questionnaire does not require any interference from the researcher. Furthermore, meaning and interpretation is based on statistical calculation based on numbers.	The interview questions were stated as neutral as possible to avoid any evaluation from researcher site. Furthermore, the interviews were recorded and. Transcribed. However,

	as with all qualitative data interpretations of data are	
	subjectively and a margin	
	for errors always exists.	
	Therefore, to enhance the	
	validity direct quotes were	
	used to undermine findings	3.

Source: Adopted by Saunders et al. (2018).

As explained in both tables, several measurements were applied to address threats to validity and reliability.

5.8.2. Control of Common Method Bias

To control or to avoid Common Method Bias (CMB) in research, several approaches to conducting the research can be applied. For instance, the dependent variable may be separated from the independent variable, data may be collected from two different sources or attention may be given to the general design of the questionnaire (Chang et al., 2010). In particular, regarding the questionnaire design, a list of potential CMB sources was given by MacKenzie and Podsakoff (2012) with a total source of 26 biases and potential remedies to control the bias. According to Baumgartner and Weijters (2012), the list serves as a useful checklist to design the questionnaire to minimise CMB by identifying the most critical sources which may increase the validity. To enhance the visibility of the list the table was split into three parts. Moreover, the potential remedies were modified with the measurement of this study. The first part relates to CMB that may impact the accuracy of the questionnaire as shown in table 5.12:

Potential Biases of Common Method Biases	Affects	Description	Potential remedies of this study	
Lack of verbal ability	Accuracy	Increasing the difficulty of the questions	The questions for the questionnaire avoid any	
Complex questions	Accuracy	Increasing the difficulty of the questions regarding understanding and to retrieve relevant information	academic terminology and other difficult words where possible. Furthermore, the structure of the questions was kept as easy	
Item ambiguity	Accuracy	Increased difficulty to understand the question	as possible to avoid complexity Moreover, each question was formulated as precisely as possible to avoid several interpretations. Also, no double barrelled questions exist.	
Double-barrelled questions	Accuracy	Increase difficulty to understand the question and may lead to ambiguity	The questionnaire was tested during the pilot-test phase with a variety of participants. In this	

	Table 5.12 Common	Method Bias -	Threats to	Accuracy
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			line, the pilot sample included students as well as experienced academic staff members to counter the potential biases.
Lack of experience	Accuracy	Participant's ability may hinder to answer the questions	Most questions refer to the participants' experience where everyone can relate to. However, there are also questions about their VR experience which was experienced the first time by tourists.
Questions rely on recall	Accuracy	May lead to satisficing because of the difficulty to recall important information	Most of the questions were related to past events and to tourist's current VR experience. A few questions were relying on recalling events based on the visual stimulation in VR. However, it was not necessary to recall specific events or details, the focus lied on rather if memories were present.
Audio only such as telephone versus visual presentation of items	Accuracy	Keeping the questions and the answer options in short- memory may lead to overload in memory	The questionnaire was distributed physically were participants had to read and answer the questions on a sheet of paper. Hence, it was not necessary to memorise questions.

The next table 5.13 involved CMB that may arise through satisficing meaning that participants are less thorough when answering the questions due to being unable or not willing to provide an accurate answer. In this line, participants may respond more stylistically and hence, bias the results (MacKenzie and Podsakoff, 2012).

Table 5.13 Common Method Bias - Satisficing

Potential Biases of Common Method Biases	Affects	Description	Potential remedies of this study
Common scale attribute (same scale types, scale points and anchor labels)	Satisficing	May increase the perceived similarity and redundancy of items. This may lead to response consistency, less item comprehension or judgement	The questionnaire used the same scale, namely Likert-type scale with 7 options without anchor labels. Moreover, few participants perceived questions similarly. This was true, since it was necessary for measuring the new constructs. However, it was not explained that few items may be perceived similarly before the questionnaire started.
Grouping related items together	Satisficing	The same as common scale attribute and participants may use	Each participant received a questionnaire with randomised questions and hence, response

		previously answers to response current question	patterns of related items were minimised.
The availability of answers to previous questions	Satisficing	Makes it easier to use previous information for current question and may lead to consistency of answers and to implicit theory	Since the questionnaires was randomised it was difficult for participants to check previous answers of similar items.

The next table 5.14 considered CMB sources that might affect the motivational aspect of participants. Therefore, keeping the motivation high leads to a more accurate response and hence, reduced the biases of results (MacKenzie and Podsakoff, 2012).

Table 5.14 Common Method Bias - Motivation

Potential Biases of Common Method Biases	Affects	Description	Potential remedies of this study
Low personal relevance	Motivation	Less cognitive effort leads to poorer judgement	Even though the information does not seem to possess any personal relevance for the tourists, their participation was repeatedly appreciated.
Low self-efficacy to provide a correct answer	Motivation	Less cognitive effort and willingness to provide a correct answer	It was highlighted to each participant that the purpose of the study was relevant to finish a
Low need for cognition	Motivation	Less cognitive effort and motivation may lead to a diminishing of thoroughness of information and to fill the gaps in what is recalled	PhD degree and does not aim any commercial interests.
Low need for self- expression, self- disclosure or emotional catharsis	Motivation	Same effect as low need for cognition which may lead participants to answer carelessly, randomly or non- purposefully	Participants were motivated by expressing the author's gratitude for their participation. Moreover, it was repeatedly verbal expresses that their opinion and feedback is much appreciated.
Low feelings of altruism	Motivation	May decrease cognitive effort on behalf of the researcher leading to a decrease in thoroughness of retrieving information and to fill in the gaps	Since repeat tourists were the target sample, the author expressed several times how important the personal experience was necessary to take part in this study.
Agreeableness	Motivation	Uncritical acquiescence to statements, searching for cues how to respond and change responses for acceptability.	It has been stressed out to read the questions and to provide the best answer from participants' point of view.

Impulsiveness	Motivation	Decreasing attention to questions and instruction which may lead to a less accuracy of information	This aspect involved stressing the importance, accuracy and to weigh alternatives before responding. This was not stated	
Dogmatism, rigidity or intolerance of ambiguity	Motivation	Dogmatism (or rigidity) may heighten feelings of certainty and thus increase willingness to: make an estimate based on partial retrieval; and/or draw inferences based on accessibility or to fill in gaps in what is recalled. This can lead that people may see things black or white	explicitly but pointed out that participants have time and there was no need to rush to complete the questionnaire.	
Implicit theories	Motivation	Participants may response in consistency with their theory	One way to mitigate is to separate dependent with independent variables or to introduce a temporal, proximal or spatial separation. It was not possible to divide the independent from the dependent variable in this study. However, the questionnaire was randomised and therefore difficult for participants to see a pattern.	
Repetitiveness of the items	Motivation	May lead to less optimal answers and to an increase to respond in a nondifferentiated manner	Most question involved the context of VR and therefore questions referred to participant's VR experience and wording of questions may be seen as repetitive. Furthermore, no changes were made regarding reversing items or changing formats. Thus, it can be argued that a certain degree of repetitiveness was given.	
Length of scale	Motivation	May decrease cognitive effort to provide optimal answers and lead to a poorer understanding and judgement.	In general, the motivation is higher if the questionnaire is short, have easy questions and reducing the repetitiveness of items. The questionnaire for this study was kept simple as possible and as short as possible. The questionnaire was formatted to fit on three pages without having a too-small font size. Moreover, the length of the questionnaire was tested during the pilot stage. However, a few questions may be perceived as long and therefore might lead a lower motivation.	
Forced Participation	Motivation	May increase psychological reactance and decreases cognitive effort to produce precise answers or to be faithfully	The author has verbally expressed the appreciation and the spent time for the participation. It was verbally expressed that withdrawing from	

			the study was possible at any time. This was also clearly stated on the consent form.
Presence of interviewer	Motivation	May lead to social desirability to avoid social consequences of being honest	The questionnaire was self- administered, and the researcher was not involved actively when participants were fulfilling the questionnaire.
Source of the survey is disliked	Motivation	May decrease cooperation	Each participant was treated respectfully. Each approach to participants were made with the author's name the institution and the purpose of the research project. In general, participants perceived the survey positively since their contribution was to finish the PhD project.
Contexts that arouse suspicious	Motivation	Participants may hide their true opinion and may response carelessly or randomly	Before commencing with the questionnaire each participant had to sign the consent form. The consent form informed participants about the purpose of the study, risks and how the data will be used. Further, additional questions were answered honestly and transparently.
Measurement conditions that make the consequences of a response salient	Motivation	May increase the likelihood of response to be socially desirable or to avoid undesirable consequences	Through the consent form anonymity were guaranteed.

Source: MacKenzie and Podsakoff (2012)

Unlike, procedural remedies that can be applied before the research, statistical control
can be used after the research was conducted Chang et al., 2010). However, also
applying statistical methods to identify common method variance can be viewed
critically. Following the distinctive debate about CMV, Richardson et al. (2009) argued
about the effectiveness of post hoc tests. In this respect, the main question related to
the case of the non-existence of CMV and to what extend does statistical
measurements identify the absence of CMV. Further, in the case of CMV, do the
statistical techniques identify the presence of CMV correctly. Despite the discussion
about the existence of CMV several authors propose various approaches to how
statistical measurements can be applied to control CMB. In this respect, Malhotra et
al. (2006) described four approaches as a multitrait-multimethod procedure, factor
analysis, Harman's single-factor test and marker-variable technique. According to
Schwarz et al. (2017), the most used statistical approaches to control CMB involves
Harman's One Factor Model, CFA marker technique and the unmeasured latent

marker construct. Especially the marker technique has been proposed as a statistical useful approach to control CMB (Malhotra et al., 2006; Lindell and Whitney, 2001; Williams et al., 2010; Podsakoff et al., 2003). In this respect, a marker variable represents a single variable that is theoretically unrelated to at least one other variable. In this line, CMV can be identified if one correlation between constructs equal zero and possess discriminant validity to the research design (Lindell and Whitney, 2001). For this study, CMB will be tested as suggested by Kock (2015).

To enhance the validity and reliability this study explained measurements that were applied before or during the research process. Furthermore, based on the various steps that can be performed after the research a marker variable was integrated into the questionnaire to be able to detect CMV statistically. Therefore, this study demonstrated additional steps to enhance the validity and reliability which contributed to the overall quality of the research.

5.9. Ethics

Ethical approval for the data collection was obtained before the data collection process and for both stages of the data collection process. At the beginning of surveying, participants were informed about the aim of the study. Further, they were informed that participation in the survey was voluntary and anonymous and that they had the opportunity to withdraw from the survey at any stage. They have been questioned on the specifics of their health and they have been informed on the potential risks using the VR device. The contact information of the researcher was also provided for respondents to obtain further information about the survey.

5.10. Summary

This chapter discussed the philosophical foundation that guided the research process. Further, the research approach and strategy are addressed. Followed by demonstrating the mixed method approach the chapter discussed also outlined the research design and ethical considerations of this study. The following two chapters explain each research stage and demonstrate how each phase was executed. Also, threats to validity and reliability issues are discussed for the qualitative and quantitative stage. In addition, common method biases are addressed and demonstrated what measures were taken to minimise it before and after the quantitative research phase.

Chapter 6 - Qualitative Research phase – Exploratory Semi-Structured Interviews

6.1. Introduction

To achieve the second objective for this study a qualitative research method has been applied. For this purpose, in-depth interviews were carried out at the Lake District National Park (LDNP) to identify the key constructs of VR in this rural setting.

6.2. Instrument design

For the first research phase of the explorative sequential mixed method design of this study, qualitative data collection was applied. Within qualitative research, data can be collected through interviews, focus groups, observations (Saunders et al., 2012), or documents (Patton, 2002).

Since interviews, both semi-structured and unstructured, focus on the individual level, focus groups involve the discussions of a group of people. Hereby, focus groups aim to produce shared opinions about a topic that is controversially discussed within the group of participants. Therefore, focus groups may include participants with similar experiences to address several questions in depth (Trace, 2013). In contrast, interviews focus on individuals obtaining rich data about their point of view, opinions or meanings (Bryman, 2015). The literature showed both approaches possess advantages and disadvantages. For instance, according to Axinn and Pearce (2006), participants may be encouraged to discuss actively within a group discussion. However, participants may also hesitate to share their opinion in a group setting and prefer face to face interviews. Hence, both approaches are considered to be appropriate by focusing on different aspects leading to a distinct view of the research phenomenon.

This study applied interviews for the first research stage. The reason for choosing interviews is that it allows the researcher to explore people's feelings, experience, thoughts or their level of knowledge (Patton. 2002) representing important aspects of PA theory. From the psychological perspective, people possess their ways of thinking of their environment and their activities within this environment. People distinguish between different entities and these differences are incorporated in categories or concepts. Thus, to examine their behaviour, it is central to understand how people use and develop these categories. People's views can be explored from the viewpoint of the participant or of the categories, where people create their world view around those

(Canter, 2016). This also includes VR environments as experiences stimulated in virtual worlds are similar to experiences in the real world (Adams, 1997, Goel et al., 2011;). In this respect, interviews produce data that are reflected in different stories told from different perspectives and may show commonalities among tourists (Smith. 2017). Moreover, according to Bryman (2012), interviews are the most widely used method in qualitative research, flexible to use and less time consuming than observations or focus groups. There are three main types of interviews, namely structured, semi-structured and unstructured interviews. While semi-structured interviews follow a certain theme of question unstructured interviews are very open and free (Jennings, 2005). In this line, this study considered applying semi-structured interview questions for various reasons. Firstly, the main goal of semi-structured interviews allows to capture data around a key topic and secondly, it provides the freedom for further exploration to discover new knowledge (Wilson, 2013). Moreover, according to Saunders et al. (2015), based on the interview situation key questions may be skipped or changed in their order depending on the conversation flow. Hence, choosing a semi-structured approach to the design of the interview questions was perceived as best to answer research objective 4 and to explore VR within a given theoretical background of PA.

The following table 6.1 provides an overview of key characteristics, strengths and weaknesses of using semi-structured interviews:

	Characteristics	Strength	Weaknesses/Risks
	Non-standardised questions	Establishing personal contact	Preparation is needed in terms of knowledge about the research topic
Semi-	Key question being covered	Achieving a higher response rate	Cultural differences should be considered
structured	Variation of question and order in each interview	Improve reliability of data (e.g. received feedback from manager and his assistant)	
	Mostly used method in qualitative research	Asking complex questions	Wrong timing might lead to interruption
	Producing stories and narratives	Asking many questions	The wrong location might be uncomfortable for the participant

Table 6.1 Key	features	of Semi-Structured	Interviews
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Source: Marvasti (2014) and Saunders et al. (2012).

In this study, semi-structured interviews enable the researcher to ask a heterogeneous group of tourists various PA related questions about their relationship to the Lake

District. This allowed the introduction of the purpose of the study and the setting of the interview (Wilson, 2013). It also allowed capturing tourists' previous experiences and information about their current stay. This was important since tourists have a different image, opinion and level of attachment to the Lake District and thus, additional information could be used as prompts to ask additional questions (Wilson, 2013). Moreover, since the application of VR experiences in a rural destination is poorly explored, the explorative aspect of semi-structured interviews allowed to ask further questions about participants' VR experience in combination with their existing knowledge based on previous experience and their current stay at the Lake District. Semi-structured interviews give freedom to the participants to talk about aspects that are considered to be significant for them (Longhurst, 2010). In this line, questions were developed by reviewing the literature and covering important aspects of PA such as tourists' knowledge of the place, emotional? relationship, experiences, memories, perceptions and the meaning of the Lake District.

6.3. Pilot Study

According to Kim (2011), a pilot study helps to adjust the research instrument to answer the research questions. This ensures to make changes before the main data collection phase starts. For this purpose, the pilot study took place at the tourist information centre in Windermere at LDNP in July 2017. The initial research questions were divided into two parts as table 6.2 shows:

Part one: Before VR experience
1. How would you describe this place?
2. How would you describe your relationship to this place?
3. What feelings do you have for this place?
4. What kind of memories do you have of this place?
5. What makes this place especially meaningful/important to you?
6. When you compare this place to other similar places, do you consider this place as your most
preferred one?
Part two: After VR experience
7 How has the VR experience influenced your relationship to this place?
8 How has the VR experience influenced memories of Lake District?
9. Has the VR experience enhanced your emotional engagement to Lake District?
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Table 6.2 Initial Interview Questions

The first part examines tourists' attachment to the LDNP and the second part presents the effect of VR experience on tourists' PA. There were 5 participants and all of them were repeat visitors. The profile of participants who were interviewed can be found in table 6.3.

Participants	Age	Gender	VR Experience
P1	74	Female	No
P2	29	Male	Yes
P3	68	Female	No
P4	54	Male	Yes
P5	64	Male	No

Table 6.3 Participant's profile of the pre-study

The interviews lasted between 5 and 10 minutes and have been transcribed. The age ranges from 29 to 74. Moreover, it can be observed that neither of the two female participants nor the oldest male participant had any previous VR experience. The results of this pilot study revealed that the answers did not produce enough data concerning the research questions and to the fourth objective of this study. Therefore, the questions were revised and altered to overcome the identified problem and presented in data collection.

6.4. Sampling

A sample represents a part of the research population that is identified to take part in a study to answer the research question (Matthews and Ross, 2010). In this respect, sampling can be divided into probability and non-probability sampling. For the latter, some statistical inferences about the population cannot be made (Saunders et al., 2012). However, unlike in quantitative studies, the goal of qualitative research aims to answer the research question effectively and therefore, the aim of the sampling is not to generalise to the population. Therefore, qualitative sampling aims to understand human problems which might lead to a misunderstanding for quantitative researchers (Marshall, 1996). In this respect, qualitative sampling aims to achieve a deeper analysis rather than to cover a wide range of participants (Tracy, 2013). According to Bryman (2015), within qualitative studies, purposive sampling is widely applied.

However, convenience and theoretical sampling may also be applied (Marshall, 1996). Further non-probability methods include quota sampling, purposive sampling, volunteer and haphazard sampling methods as shown in table 6.4:

Group	Technique	Main Characteristic
Quota	Quota	Sampling is based on certain characteristics based on the population
Purposive	Extreme Case	Sample is unusual or a special case that will help you to get enough information for you research question
	Heterogeneous	Sample that enables a maximal variation of cases to produce diverse forms of information that might give you a range of key themes
	Homogeneous	Sample is focused on a specific subgroup with similar characteristics
	Critical	Sample that is perceived as dramatically or important and give enough information about the population
	Typical	Sample represents a typical case that is a representative case
	Theoretical	A special form of purposive sampling especially used in ground theory. Sampling is based on having a rough idea where to sample. Based on the analysis further sample will be chosen.
Volunteer	Snowball	Sample is difficult to identify. Participants decided to take volunteer instead of being chosen. Further sampling is recommended by previous participant.
	Self-selection	Participants select themselves to participate in the research.
Haphazard	Convenience	Sample is selected without any further consideration. The selected participants take part because they are easily available.

Table 6.4 Overview of non-probability sampling methods

Source: Saunders et al., 2012.

Since this study explores the effect of VR on PA within a tourist destination, only repeat visiting tourists were included. In this context, a repeat tourist is defined as a person who has travelled at least once to the destination representing a market for destination and place attachment. (Morais and Lin, 2010). Therefore, the sampling was purposively heterogeneous aiming to cover tourists from all age groups and to have an equal gender distribution. This was perceived as important since travelling to the Lake District is popular among all tourists such as individual tourists and travelling with families. Furthermore, it was important to explore the VR experience from a variety of participants with different needs. In this line, it was significant to get a deeper understanding of VR experiences from different perspectives.

Moreover, the diverse sample aimed to include also participants that are not primarily interested in new technology. This should ensure not to have a biased sample who were primarily interested in VR. Therefore, the aim was to include tourists that were new to immersive technologies but may use VR in the future. A sampling at the destination provided the opportunity to explore tourists' opinions, thoughts and perceptions within a different mindset. In this line, they may relate to the VR experience in greater detail and how VR may affect their current experiences. Given all these diverse characteristics, the chosen sample ensured a range of different participants that might respond to different angles contributing to clarify and adding a new understanding of how VR may impact tourists' PA.

6.5. Sample Size

The sample size in qualitative studies does not follow any strict rules or guidelines and therefore, a debate exists around 'how many' participants are suitable for a study (Dworking, 2012). The absence of a clear sample size leads to a discussion within the methodological literature (Trotter, 2012). However, the qualitative sample size is typically small to explore a research phenomenon in-depth and to generate a more holistic understanding and may include a variety of different participants in a study (Patton, 2002). This smaller sample size does not aim to generalise to a larger population, rather the focus is on exploring a variety of different meanings (Dworking, 2012). Mason (2010) explored the sample size of qualitative studies used in doctoral studies. The results of 560 studies showed that the range of the sample size is between 1 and 95 with a mean value of 31. Another figure is presented by Dworking (2012), arguing that a majority of scientific literature recommend a sample size of 5 to 50 was sufficient. Moreover, Tracy (2013) suggested between 5 to 8 as valuable depending on the research questions and available resources. Hence, the sample size varies and is contingent on the nature of the study.

One important aspect of sample size involves the occurrence of a saturation process, referring to when no new information was gathered by each further participant (Bryman, 2012). According to Morse (2015a), saturation describes the process of building rich data during the research stage considering the comprehensiveness of the data and their commonalities of characteristics among participants. Although the concept of saturation is regularly mentioned within studies, controversy and debate

about its application exist. For instance, Mason (2010) concluded that a negative aspect relates to when the saturation process is achieved. This also depends on the experience of the researcher. In this respect, Bowen (2008) argued, saturation is often described in studies with no further explanation of how it was achieved. One possible explanation for the lack of clarification is based on the reason that there is no established method of achieving it practically (Francis et al., 2010). In this respect, Morse (2015a) argued, saturation or the 'richness' of the data is achieved when researchers show a higher competence of their topic and describe generalities, rather than individual cases, or as Bowen (2008) described when during the data collection the amount of new knowledge is diminishing.

However, O'Reilly and Parker (2013) challenged the focus on saturation since it has evolved from grounded theory and therefore, a broader discussion is needed of its application within other qualitative research approaches. As Guest et al. (2006) stated, saturation usually refers to theoretical saturation which is applied in grounded theory aiming to build theory. However, thematic saturation also exists, referring to the saturation process of new themes of the data. In this line, Bryant et al. (2007) applied thematic saturation until new themes have stopped emerging. Therefore, depending on the research purpose different saturation stages may be achieved as shown by Marshall (1996) where thematic saturation was achieved after 15 interviews, whereas theoretical saturation was achieved after 24 interviews. This distinction is important since this study does not solely aim to build a new theory, rather it aims to expand theory by exploring new themes. Furthermore, the generated knowledge was combined within an existing theoretical background. In this context, according to Malterud et al. (2016), exploratory studies do not aim to discover all aspects of the research phenomenon, rather, they can be sufficient to offer new understanding that contributes significantly or contest existing knowledge. In this context, sufficient refers to the process of reaching some degree of data saturation as previously explained. To explore new themes, the sample included repeat tourists for the interview purpose. The reason for using repeat visitors in the sample results from the fact that repeat visitation shows attachment to the destination (Morais and Lin, 2010).

Participant	Gender	Age	Previous VR experience	Interview duration	Date
P1	М	22	No	17.00	25.07.2018
P2	F	21	No	17.00	25.07.2018
P3	М	49	No	17.10	25.07.2018
P4	F	25	No	17.12	25.07.2018
P5	Μ	46	Yes	13:06	25.07.2018
P6	М	26	No	16:02	25.07.2018
P7	М	26	No	10.03	25.07.2018
P8	М	28	No	12.14	26.07.2018
P9	F	36	No	13.14	26.07.2018
P10	М	71	No	16:36	26.07.2018
P11	F	64	No	19:14	26.07.2018
P12	М	59	Yes	14:00	26.07.2018
P13	М	35	Yes	10.08	26.07.2018
P14	F	26	No	19.00	26.07.2018
P15	F	79	No	10:08	26.07.2018
P16	М	32	No	17.00	26.07.2018
P17	F	40	No	17.00	26.07.2018
P18	F	54	No	13:18	26.07.2017
P19	М	37	No	00.52	27.07.2018
P20	F	68	No	09.55	27.07.2018
P21	F	37	No	10:39	27.07.2018
P22	М	41	No	17:26	27.07.2018
P23	F	36	No	17.20	27.07.2018

Table 6.5 Participants characteristics

The sample is almost equally distributed between 12 male and 11 female participants with an average age of 41.7 years and a standard deviation of 16.8 years. The age range varies between 21 and 79. Hence, a great variety of age groups is given. Moreover, in terms of previous VR experience solely three male participants indicated to have previous VR experience. The interviews duration lasted between 9:53 and 19:14 minutes with an average of almost 10 minutes per participant.

6.6. Data Collection

The main data collection took place at the Windermere/Bowness in July 2018. The participants were approached outside the Tourist Information Centre and asked for their participation. After agreeing and meeting the criteria, each participant had to sign a consent form informing tourists about the purpose of the study as well as the risks of

using VR (Appendix 1 and Appendix 2). The final questions were created after analysing the pilot study and the following changes were made for the main process of the data collection. The following table 6.6 presents the revised core question of the semi-structured interviews.

Table 6.6 Overview of Semi-Structured Interview Question

Before the VR experience:
Tell me about your last/current visit to the Lake District?
What meaning has this place for you? / What makes this place special to you
How would you describe your feelings towards this place?
After the VR experience:
How would you describe your VR experience?
How did you like the representation of LDNP from the 'bird's-eye' view?
What did you like about seeing the place from a different perspective?
How do you perceive/What do you think about the surroundings of LD in VR?
Do you think the VR experience has changed your view/relationship to the place?
If yes, how?
Tell me about your feelings towards the place after your VR experience?

The major changes following the pilot study were the reduction of the number of prestage questions and expansion of the questions taking place after tourists had their VR experience. Additionally, prompts were asked depending on the dynamic development during the interview such as known locations, previous experiences etc.

Participants were requested to complete the interview in two stages. The first stage included the usage of the VR headset and the VR experience lasted around 3 minutes. For that purpose, the Samsung VR Gear 360 was used since it operates with a Samsung mobile phone and thus, enabled a quick and easy setup and was ready to be used for tourists within a few seconds. Moreover, it allowed the researcher to be mobile and hence, to move freely at the destination and to reach out to tourists at different places within the Lake District. Furthermore, the application started after tourists put the headset on their head allowing an immediate VR experience while sitting without any further input and therefore reduced the complexity level for tourists, especially for new users. The BirdHive 360 VR application showed different landscapes of the Lake District National Park captured by a 360-degree camera operating from a drone. Hereby, tourists were able to look in any direction by moving

their heads. The following images in figure 6.1 show a few places and landscapes that tourists were able to see.



Figure 6.1 Screenshots of the VR Application BirdHive 360 Source: BirdHIVE 360 VR application

This passive VR experience allowed tourists to enjoy the varied landscape and places within the Lake District National Park. Besides the visual stimulation, the experience was reinforced with the sound of birds creating a more realistic environment of the natural landscape. Overall, the application delivered a passive visual and aural VR experience with a minimum amount of effort from tourists allowing to participate a wide range of tourists due to the low level of complexity, accessibility and comfortability of using VR. Afterwards, the second part of the interview started, and participants were asked about their VR experience, emotional engagement, perception of the LDNP within VR and how VR might impact their travel behaviour.

6.7. Qualitative Data Analysis

According to Patton (2002), qualitative data analysis can be described as having an explorative purpose and as aimed at discovery within an inductive logic. Qualitative data can be analysed through grounded theory, thematic analysis, narrative analysis, discourse analysis or content analysis (Bryman, 2015; Patton, 2002). One of the most applied techniques is thematic analysis, which was also applied in this study for several reasons. Thematic analysis is generic without strict rules and therefore provides a certain degree of freedom to the researcher (Bryman, 2015). Furthermore, Braun and

Clark (2016) mention the flexibility of thematic analysis in terms of the research question, data collection method, sample size and the creation of meanings based on the available data. In this respect, they point out that thematic analysis can be applied within small and large sample sizes. Moreover, almost any type of data can be analysed such as within an explorative study where there is a lack of understanding of a research phenomenon. Another advantage of using thematic analysis is its accessibility for the researcher, in particular an inexperienced researcher (Braun and Clarke, 2016). From a pragmatic point of view, the advantages for the researcher to use thematic analysis enables the flexibility and freedom that is needed to choose the best approach to answer the research question. Further, as Mason et al. (2010) argued, new themes within tourism are not well explored and an exploratory design may lead to a better understanding of the phenomena. Hence, thematic analysis was perceived as an appropriate analysis technique to explore tourists' meanings and perceptions of their VR experiences within a new context. In this respect, as Guest et al., (2012) stated, it is the pragmatic focus that constitutes the greatest strength of thematic analysis and it can be applied in all situations to achieve qualitative analysis transparently, efficiently and without any ethical consideration involving within a mixedmethod study.

According to Braun and Clarke (2006, p.79), 'Thematic analysis is a method for identifying, analysing and reporting patterns (themes) within data'. The theme does not need to follow the logic of how often it appears within the data, rather the researcher may identify a theme with its importance to the research question. (Braun and Clarke, 2006). Despite it being argued by some that thematic analysis is applied without any clear guidance (Boyatzis, 1998), a systematic approach of how to conduct a thematic analysis was given by Braun and Clarke (2006) as shown in table 6.7 which were followed in this study.

Phase	Process	
Getting familiar with the data set	Transcribing data, reading the data several times, making notes	
Creating initial codes	Coding interest aspects systematically	
Searching for themes	Matching codes into possible themes	
Reassessing themes	Checking if the codes match to the theme	
Defining and naming themes Refining and naming themes and creat definitions		

Table off Themale analysis process	Table 6.7	Thematic	analysis	process
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Report	Selecting of key examples for analysis and relate		
	to the research question and literature		

Source: Adopted by Braun and Clarke (2006)

Following the phases, as outlined in table 6.7 the collected data was transcribed electronically and analysed manually. Through the transcription process and several times of reading the interviews (Appendix 3), a higher familiarity with the data was achieved. The notes made during transcription led to the creation of initial codes. This process was repeated several times and codes were grouped to identify possible themes (Appendix 4). A final review of the data and themes led to the creation of the final themes. Quotes from the data were used to underpin the themes to the research question and PA literature. The results of the interviews were used to propose alterations to the PA framework. After the key themes were identified, a quantitative approach was used to test the proposed conceptual framework (objective three). The following section outlines the second phase of the data collection.

6.8. Profile of Participants

The interviews were carried out at the Lake District National Park at Windermere/Bowness on the 25th and 27th of July 2018. The following table presents an overview of all participants who took part in the interviews process for the qualitative stage of this study.

Participant	Gender	Age	Previous VR experience	Interview duration	Date
P1	М	22	No	40.50	25.07.2018
P2	F	21	No	10.30	25.07.2018
P3	М	49	No	17:12	25.07.2018
P4	F	25	No		25.07.2018
P5	М	46	Yes	13:06	25.07.2018
P6	М	26	No	16:03	25.07.2018
P7	М	26	No		25.07.2018
P8	М	28	No	13:14	26.07.2018
P9	F	36	No		26.07.2018
P10	М	71	No	16:36	26.07.2018
P11	F	64	No	19:14	26.07.2018
P12	М	59	Yes	14:00	26.07.2018
P13	М	35	Yes	19:08	26.07.2018
P14	F	26	No		26.07.2018

P15	F	79	No	10:08	26.07.2018
P16	Μ	32	No	17:08	26.07.2018
P17	F	40	No		26.07.2018
P18	F	54	No	13:18	26.07.2017
P19	Μ	37	No	09:53	27.07.2018
P20	F	68	No		27.07.2018
P21	F	37	No	10:39	27.07.2018
P22	М	41	No	17:26	27.07.2018
P23	F	36	No		27.07.2018

The sample is almost equally distributed with 12 male and 11 female participants with an average age of 41.7 years. Moreover, in terms of previous VR experience only three male participants had previous VR experience. The interviews duration lasted between around 10 to 19 minutes with an average of almost 10 minutes per participant.

6.9. Results of the Analysis of the interviews before VR Experience

Based on the first stage of the interview's participants expressed several reasons why they travelled to the LDNP. For instance, a few participants (n=4) indicated that they wanted to escape the stressful urban environment and find relaxation at the Lake District. Indeed, rural places have become consumable places where tourists seek adventures, relaxation or just a place to recover (Little and Austin, 1992; Woods, 2012). Therefore, it is not surprising, that many participants (n = 21) indicated to come to the Lake District for practising several leisure and outdoor activities such as walking (n =12), boat trips (n =7) and biking (n=2). Moreover, they liked to explore the Lake District and visit several places. On the other hand, many participants indicated to do more passive activities such as relaxing (n =13) and enjoying the scenery (n=4). Hence, a tourist experience can be active where tourists interact with the physical environment or take a more passive role, such as gazing up on the scenery (Jepson and Sharpley, 2015). A few participants (n=2) also referred to the Lake District as a place of the home which indicates a strong attachment (Lewicka, 2011).

Furthermore, all participants showed an emotional experience of the Lake District. For instance, participants (n=10) used the word 'love' to express their feelings towards the landscape such as loving the lakes or the scenery. Other participants felt very peaceful, relaxed, happy and enjoyed the silence. Hence, Lake District is a place where tourists have positive emotions about the landscape and therefore come back. Likewise,

Jepson and Sharpley (2015) explored how emotional the Lake District can be for participants and explored its spiritual meaning for some tourists. Since repeated tourists took part in the interviews, participants (n=6) were telling stories about their memories. For instance, participants recalled moments from their childhood memories such as travelling to the lakes as a child and they had fond memories of that times. However, in general, memories vary from any life stage such as coming as a teenager or as an adult to the Lake District and therefore recalling positive experience and moments do not necessarily refer to their childhood. Furthermore, participants (n=5) also remembered positive special occasions such as having a honeymoon in the Lake District and thus, those moments are unforgettable and always a reason to come to relive these positive experiences. Hence, people are tied to the place which has a meaning to them and thus memories play a key part in people's attachment to places (Riley, 1992; Strong, 2017).

The next important aspect for participants related to the social and physical environment of the Lake District. The social environment involved participants (n=6) that emphasised the aspect of friends and family as an important aspect of their holidays within the Lake District. For instance, a few participants (n=6) enjoyed seeing and to have contact with other tourists or with local people. The social aspect of people for a place is important since they might be tied to a place through other people or their shared experience at the same place (Kyle et al., 2004, Holden, 2016; Jepson and Sharpley, 2015). The physical environment of the Lake District provided for three participants cultural aspects where all three participants referred to Beatrix Potter. For the natural aspects, many participants (n=13) valued the beautiful scenery and landscape and appreciated its aesthetical value such as beautiful lakes, mountains and forests. Furthermore, a few participants (n=4) indicated that the Lake District is a unique place in England and two participants perceived the place as being abroad. For two participants the place had a mythical aura with its mixture of different landscape elements such as water, trees and mountains. Overall, the perception of the physical place was very positive which makes the Lake District an attractive place. According to Jepson and Sharpley (2015), the beautiful and unique natural environment of the Lake District with its distinct landscape qualities are a reason why people show an attachment to this place. Moreover, as García-Martín (2016) argued, people are

attracted to landscapes by giving meaning to a place through attaching tangible values (e.g. aesthetics) and intangible values (e.g. SoP) to the landscape.

6.10. Results of the Interview Analysis of Tourists after the VR Experience

The second part of the interview questions was followed after participants had their VR experience. Based on the participants' responses several main themes and have been identified.

6.10.1. Aesthetics

This theme referred to participants' perception of the Lake District in VR and involved comparison to the real environment. The interviews revealed three aspects of how participants perceived the Lake District in VR. Firstly, for a few participants (n=5) the representation of the Lake District was enhanced compared to the real environment. The second group of participants (n=9) referred to it as showing what it represents and hence, indicating no difference between VR and the physical environment. The third group (n=6) preferred reality over VR and acknowledged it as a good alternative.

The participants' interviews revealed the appreciation of how beautiful the Lake District looked in VR. Furthermore, regardless of participants' perception, they pointed out several aesthetical aspects of the LDNP within VR. Hence, seeing the landscape in VR was very aesthetically enjoyable for participants. For instance, according to P1 and P2, they argued that,

"Grasmere looks so much better in VR then, what it is".

Another example of seeing how beautiful the place is perceived in VR was given by P11, where seeing the landscape in VR was expressed in a more romantic way,

"Just the lovely colours in the mountains and Buttermere, it was so outstanding. I felt like I wanted to paint a picture. It was so gorgeous. I don't know what to say. It was lovely and so nice".

Moreover, VR can show different layers of aesthetical aspects such as light and colours of natural elements as P18 described after seeing the forest in VR,

"Just the beautiful brightness and the lushness of the forest and the colours..., I think it is just consolidated or reinforced my view about the lushness and the beautifulness of the location".

The visual quality of the Lake District also led participants to appreciate the landscape within VR. Even though tourists had a strong bond to the place VR reinforced the intangible value of the place in terms of its holistic perspective. The appreciation is based on existing feelings, views and positive relationship to the place where VR had enhanced it by showing the Lake District from a new perspective. For example, for P1 and P2 VR had changed their relationship to this place as P2 argued,

"Yeah, I think it made me to appreciate more, liked more. I have not seen it from above."

In a similar way, P3 and P4 pointed out that VR had not directly changed their relationship to the place but,

[P3] "It is maybe a greater appreciation of the beauty of the place..., 'There is definitive a greater appreciation, but we have such an affection for the lakes anyway".

Likewise, P11 described their feelings to the place as not affectated but having the VR experience it reinforced the overall meaning of the place and the values this place holds,

'No, I always love it, but seeing it in a VR, has really brought it to me. I think it really made me think how much nicer than I even thought it was to be honest.'

According to Marković (2012), the definition of aesthetics can be divided in three parts. Firstly, it has motivational or attentive dimension meaning that people are engaged and aware of a particular object of interest. Secondly, aesthetic has a cognitive aspect such as appraising objects and events that differ from their everyday life. Lastly, aesthetic experience has also an emotional dimension describing people's emotions and feelings toward the aesthetic objects. This is line with findings of this theme based on participants responses. In general, participants' aesthetic perception of the landscape referred to how beautiful the scenery of the Lake District was in VR. For example, participants appreciated the beauty of the lake, the mountains or the green colour of the forest. Furthermore, they also enjoyed how beautiful the different places looked like in VR. However, research on virtual aesthetics in rural places and immersive technologies are limited. But, existing studies have explored VR and aesthetics in different ways. For instance, in an art context VR can applied to capture the aesthetics of painting and enhance people's feeling (Zhang, 2015). A different approach is shown by Vercelloni et al. (2018) by examining aesthetic values of a coral reef within VR by showing the Great Barrier Reef in Australia. Similar, tom Dieck et al. (2018) applied AR within an experience economy context where aesthetics represents one realm of it. The results show that aesthetic within AR shows to be an important aspect. Moreover, Teisl et al. (2018) assessed participants' aesthetics of the destination within VR when offshore windfarms may become part of the landscape. Their findings show that compared to a static illustration such as images or in text form, VR had a greater effect. For instance, participants were able to assess the effect of the windfarms better and were more negative compared to other media. Hence, most participants were able to predict how their behaviour might change in the future.

For the LDNP aesthetics of the landscape is an important factor and is valued by tourists (Jepson and Sharpley, 2015). Literature on VR and aesthetics is scarce and scattered in different fields. This theme focuses on a rural context and within VR and thus it can be referred to the virtual aesthetics of a rural landscape. Most participants perceived the aesthetics of the Lake District represented in VR as positively. Moreover, participants valued positive aspects such as its beautiful scenery, different colours and nice weather within VR of the Lake District. Furthermore, in combination with these aspects, the representation from a 'bird's eye view" showed a unique and aesthetic image of the landscape which was highly valued by participants and thus increased its meaning and showed a positive relationship towards the place.

Furthermore, the aesthetic value of the Lake District also increased the appreciation of the overall meaning of the place. The existing relationship to this place regardless of its nature might not had changed directly by seeing the Lake District in VR. However, from a new perspective it showed that they realised how precious the place was. This kind of new experience enhanced participants' appreciation of its intangible value and meaning of this place. According to Benovsky (2016, p.352) 'Appreciating the landscape is a unique aesthetic experience'. Moreover, as the author further argues,
landscapes are objects and relate to an observer and hence, this person is simultaneously creating and observing the landscape. Furthermore, the same author distinguishes between two types of appreciation, namely, the 'informed' and the 'simple'. The former relates to a more objective view such as knowing that a landscape or a specific type of landscape element is rare and thus showing appreciation for it. The latter aspect refers to the subjective view of appreciation of its shape or colour and based on the person it might evoke an emotional appreciation of a landscape. Both aspects are related and could be seen as complementary (Benovsky, 2016).

In a social-media context, Tieskens et al. (2018) explored people's landscape appreciation by analysing various social media platforms to measure correlations between landscape elements in images and density of photos to reveal which landscape is more appreciated by people. Hence, based on what meaning people place on various landscape elements the number of images may indicate an increased visitation of that specific landscape and may show a higher appreciation. Besides the desktop-based application, also immersive technologies such as VR as this study argues shows its effect on tourists' appreciation for the rural landscape and hence can be perceived as a new theme within the literature. Since the aesthetic value and appreciation of the Lake District took place during the VR experience it can be assumed that it might be an important factor for presence. Previous studies confirm that visual cues are crucial to affect presence as tourists engaging actively in the VR experience by looking around to identify several landscape elements, mentioning colour contrast and the atmospheric environment in VR (Tussyadiah et al., 2016; Jung et al., 2017b). Furthermore, as the aesthetic experience might be very emotional as well, it might lead to an enhancement of presence. This relationship is well documented in the VR literature (Chirico and Gaggioli, 2019; Gromer et al., 2019; Felnhofer et al., 2019; Thornson et al., 2009; Uhm et al., 2020; Baños et al., 2004; Baños et al., 2008; Baños et al., 2012).

Moreover, participants also remembered how beautiful the Lake District was by comparing the aesthetic features in VR to the real destination. In this sense, participants identified different landscape elements during the VR experience and evaluated their attractiveness in VR. According to Kirillova et al. (2014) within tourism, the physical attractiveness of a natural destination is a subjective evaluation of the aesthetic value considering multiple aspects that can be used to judge the landscape.

Thus, the aesthetic qualities of the Lake District's landscape had an impact on tourists' memories. Hence, this theme may also be important within PA theory since aesthetics and appreciation might show an emotional link between the tourist and the landscape and thus, indicating an attachment to the place. However, as the literature and the findings of the study suggest, this might be achieved through presence and memories, and consequently have an indirect impact on PA. Therefore, it is hypothesised that: H1: Aesthetics positively influences Presence.

H2: Aesthetics positively influences Memories.

6.10.2. Atmosphere

Another theme within VR was the atmosphere of the landscape which participants (n=11) felt by using VR. The atmosphere was captured by visual and aural stimulation of the VR application. Despite having the interviews in an open place where background noises were inevitable VR allowed participants to forget the noisy environment and to enjoy their VR experience. The interviews showed that VR had a positive contribution to the atmosphere of the place. For instance, one way of describing the atmosphere of the surroundings was given by P2 and P8,

'it is just tranquil, it is very peaceful the lakes '.

'I suppose that way it used to be seen the sceneries all of the time. It was nice to see. I know they were walkers and I know there were a few cows and images. It was just quiet and peaceful. It was nice.'.

Unlike the visual elements, aural aspects played a key part by adding to the VR atmosphere of the Lake District. A few participants (n=8) mentioned how the sound of the VR application enhanced their experience positively and added to the ambience of the landscape. For example, P6 and P7 mentioned that,

'I mean the noises that you could hear add to the realism of it'.

Furthermore, P23 described how immersive the sound experience was in VR, 'I suppose, it was really nice to have the audio as well, you could feel being there and listen to the environment'. The VR experience created a positive virtual atmosphere of the LDNP which had a positive impact on participants' feelings. Those feelings were described as peaceful and further VR showed how relaxing the atmosphere was in VR. According to Böhme (1993) atmosphere can be described as an intermediate between aesthetics and human beings considering its relationship in terms of the quality of the environment and the human capacity. Hence, as Lund (2013) argues, the sense of atmosphere derives from the steadily transformation of the landscape and influences human's perceptions where meaning is given to the landscape elements within the natural environment. Therefore, as Philippopoulos-Mihalopoulos (2013) argues, the meaning of atmosphere can be described as the link between the sensorial experience, the feelings and meanings. According to Breiby (2014) within tourism, harmony and coherence may play a key role influenced by the external environment and thus in a natural context seeing different landscape elements within a contrast influenced by weather, seasons, also size might have a positive impact on participants staying. Moreover, also hearing animals, water or even silence may add to the touristic atmosphere. Hence, in a VR context, the atmosphere varies on the different aspects presented within the VR application.

For instance, according to Krasonikolakis et al. (2013) the impact of a shop atmosphere in VR is influenced by colours, music, images, product presentation, people etc. Further, in a heritage context, the atmosphere can be created by adding people, buildings and various other landscape elements within the VE to make it more realistic and try to capture the atmosphere of past times (Kusuma et al., 2017). In this sense, the atmosphere could also stimulate memories as an atmospheric feature such as weather or peacefulness of the lake, that might lead to remember past experiences. Similar to the aesthetic features, as participants described the atmosphere of the environment also past references could have been made internally and therefore, being part of their memories of the Lake District.

Furthermore, according to Riva et al. (2007), based on the atmosphere within the VE different emotions were able to be triggered. In this sense, Felnhofer et al. (2015), manipulated the virtual parks by setting different colours, adding, or deleting specific objects such as trees, vehicles, or clouds to create a specific atmosphere which affects people's emotional state. In the case of LDNP participants describe different aspects of the atmosphere captured by VR. For instance, participants felt very relaxed and

peaceful and thus expressing their positive emotions. Furthermore, the majority of participants valued the visual qualities of the rural environment such as different surroundings of the landscape including animals. Unlike the visual elements, also the sound of the rural environment such as listening to the birds is part of the atmosphere. Overall, the virtual atmosphere of the 360-degree representation of the LDNP may enhance their experience and might impact tourist's perception, meanings and feelings positively to the rural environment and therefore might strengthen their bond to the place. Similar to aesthetics, emotions may enhance the presence as the atmosphere was perceived during the VR experience. In addition, the atmosphere might also reinforce tourists' memories. Therefore, it is hypothesised:

H3: Atmosphere positively influences Presence.

H4: Atmosphere positively influences Memories.

6.10.3. Accessibility

The theme accessibility revealed the opportunities for a number of tourists to travel to the Lake District by using VR. Hereby, the benefits involved being able to visit several locations due to of various travel restrictions. The reasons may vary from tourists with special needs or other problems that made them unable to travel around the Lake District or to specific places within the Lake District (Pantelidis, 2019). In this line, the theme accessibility could be assessed from different viewpoints indicating the fully immersive VR experience as a positive impact on tourists' on-site experience at the destination. One aspect refers to VR as a tool to provide a substitutional experience and therefore, as an alternative to physical travel. Another aspect indicates VR to be used as a tool and to provide a complementary experience. Regardless of the intention, VR enhances participants' tourist experience at the Lake District allowing tourists to explore the destination digitally.

This identified theme is mainly categorised to travel to several locations in the Lake District instead of visiting them physically by having a fully immersive VR experience. Interestingly, several participants (n=14) who were not handicapped indicated their concern about inaccessible locations within the destination. In this sense, tourists pointed out that VR may serve as a tool for individuals with disabilities and unable to access the Lake District easily. As an example, with an ageing population of tourists, there is an increased probability of being limited in moving and hence, exploring the

destination might represent a great difficulty. According to P12, VR cannot replace reality, but it is a good alternative (Pantelidis, 2019, p.388):

"It will never be the real thing, it is nice idea being able to look all over everything as supposed to stand at the bottom of the valley. Just like being a little ant,... the older you get the less likely you climb up, all the other things or to persuade other people to go up with you. It is an opportunity to go up to these place without actually doing it, because you know from past experience, it will never be the same as the real experience, but it is a good substitute".

An additional reason for enjoying VR could be seen by the fact that tourists may not have sufficient time to see their desired places. Therefore, VR serves as a great opportunity to explore destination in VR as P13 explained (Pantelidis, 2019, p.388):

"I like seeing places but I might not going to visit Buttermere. We don't have time. It was nice to see".

Also, tourists who rely on public transportation services could benefit from VR. Therefore, if traveling is not possible due to the lack of alternatives, place access is restricted. Subsequently, VR enables a good substitute as P18 described (Pantelidis, 2019, p.388):

"I would like to go but you have to drive there. I had the opportunity to drive there once, but I did not want to drive. It goes 25- 30 gradient and I did not want to drive a car manual there and none of the buses go there. I visited all the other passes where the bus goes to but this is one where the bus do not go there".

An additional key benefit of using VR involves handicapped participants with any kind of disability not allowing them to move physically. Therefore, the VR experience enabled the possibility to travel around the Lake District that were less accessible (Pantelidis, 2019). For instance, tourists may be in a wheelchair such as P23, and personally described her VR experience as following (Pantelidis, 2019, p.389):

"It will offer some substitution. We can't get the chair up there and I can't walk there, it

offers that kind of substitution".

Many participants valued the opportunity of having a VR experience as a substitutional experience despite not having a clear motive to do that. The reason might be a result of participants' observations of how inaccessible a few locations were at the Lake District. Based on that, VR was perceived as an alternative tool to use instead of not being able to travel. However, tourist who were restricted in their movement and had any other reasons the VR experience seemed to have a positive attitude towards VR as an alternative experience despite being at the Lake District. Accessibility in VR presented an alternative in comparison to physical travelling. The comparison between real and virtual experience can be very similar as supported by the literature. According to Goel (2011), interacting in a VR world is possible to simulate real experiences since the world presented in VR might be the same as the physical world. Another study by Kuliga et al. (2015) explored how a human interaction perceives a real building and the same replicated in VR. The findings show that VR can be used as a substitute for reality. Hence, showing to be a reliable research tool. In this sense, Higuera-Trujillo et al. (2017) explored some media to existing environments and found that the 360degree panorama predicts at bests psychological results and VR physiological results. Subsequently, individuals perceive the VR experience to be equal to the real experience. This enables them to get a real feeling about how the Lake District.

Therefore, in some cases, VR might be a substitution for a real experience which may enhance the overall tourist experience. However, the perceived realistic experience was mainly mediated and therefore, the substitutional experience was elicited through presence. In addition, accessing the places allowed participants to remember their past trips. According to Zhang et al. (2021), travel photographs have a positive impact on autobiographical memories. Consequently, visualisation helps to maintain the relationship to the destination. Similar to this study, participants reconnected to the place in VR within a fully immersive experience which has been shown to have a stronger impact than 2D images (Griffin et al. 2017). Thus, VR as a medium had a positive impact on tourists' memories by allowing them to access the Lake District and to keep the bond to the Lake District active. Therefore, it is hypothesised:

H5: Accessibility positively influences Presence.

H6. Accessibility positively influences Memories.

6.10.1. Presence

Presence has emerged as a theme that is a widely known concept within immersive technologies such as VR or AR (Pantelidis, 2019). In this study, presence was experienced during participants' VR experience. According to Steuer (1992) presence can be defined as having the feeling of 'being there'. Hence, participants were mentally transported to different locations they were experiencing within VR. In particular participants (n=11) reported the feeling of presence and thus, indicating being as part of the Lake District. For example, six participants indicated a feeling of flying and this novel experience was exciting and enjoyable as P17 simply stated (Pantelidis, 2019, p.387):

"I felt like I was flying ... "

Another participant (P16) expressed his fear of height but perceived the VR experience as positively (Pantelidis, 2019, p.387):

"I felt like I was there, and it intimidated me a bit but for the rest I felt quite safe. I did feel like being there the entire way watching the audio, everything. You move your head around, you are moving the camera, and everything is going with. It was brilliant"

and further compares the VR experience as (Pantelidis, 2019, p.387):

"You feel like to be on a helicopter and looking down, this is the best way to describe it. On the ground level you cannot see so much but that looks fantastic, you are feeling like watching it all".

A number of participants appreciated the opportunity to watch the landscape during experience presence and flying over the Lake District. In addition, this enjoyable activity had also P20, and she was associating her feeling of presence as to be on a boat at the lake (Pantelidis, 2019, p.387):

"It was at the lake and being able to look all around as you were in a boat in the middle of the lake...,I never sailed on Buttermere. It was like going on a boat in Buttermere instead of just walking around and be able to see the mountains".

This theme is characterised as participants' emotional state after using VR. Almost every participant did not have any prior VR experience except three male participants.

However, there was not a single dislike of using VR at the LDNP. Moreover, many participants (n=17) expressed positive feelings and showed emotions while they were having their VR experience. Furthermore, a few participants (n=4) were surprised and amazed by using VR as P11 described their feelings about the first VR experience,

'That is fantastic, I absolutely loved it. Stunning, absolutely stunning'.

However, two participants were sceptical towards the new technology but after using it they had a positive attitude towards VR and enjoyed their experience. Furthermore, positive emotions were present as P11 simply stated after asking about her emotions after using VR,

'Happy, happy, nice, content'.

As a general observation, VR enabled tourists to feel to be part of that location they were experiencing during their VR experience. This was perceived as a positive emotional experience of having the feeling of 'being there' to one of these places of the Lake District. Hence, VR provided a novel and unique experience for tourists at the destination by allowing them to visit the place remotely (Pantelidis, 2019). Subsequently, VR showed to increase the tourist experience by allowing tourists to feel the concept of presence as part of their fully immersive VR experience, which cannot be replicated by other media.

The identified theme presence is well researched in the VR literature. According to Loomis (2016), one reason for getting high attention in the literature is because it leads to presence. Moreover, as Slater and Wilbur (1997) argued, presence can be divided into subjective and objective aspects. The subjective part refers to the user's degree of disbelief and experiences of the feeling of 'being there'. The objective aspect refers to a similar behaviour daily that can be observed in VE. Further, as Baños et al. (2007) stated immersion and an emotional environment may have a positive impact on presence. This study provided a fully immersive experience and therefore, can be assumed to have a greater impact on presence. Consequently, as Ding et al. (2018) found, a higher level of presence might also lead to an enhancement in people's emotional response within VR. In this sense, Yung et al. (2020) confirmed that presence in VR had a statistical effect to trigger higher emotions that had an impact on revisit intention. Similarly, Wagler and Hanus (2018) concluded that presence influences the affective state and attitudes compared to the real world leading to

positively towards an intentional behaviour. Hence, as shown by this theme presence can provide a realistic feeling of experience the place and also to trigger emotions. This in turn it might enhance tourists' bond to places and therefore, it can be hypothesised:

H7: Presence influences positively Increased Place Attachment.

6.10.1. Memories

The next theme related to participants' memories by using VR at the LDNP. Based on the different places shown in VR participants (n=10) recalled their past and current holidays. Based on participants' VR experience the variety of memories were different. They ranged from childhood memories, where participants remembered travelling to the Lake District with their parents or other family members. Furthermore, youth or adult memories usually involved trips and vacations as single, group or family trips. For instance, P14 was recalling her youth memories after her VR experience,

'It gave me memories when I last came because that little village with the grass fields where we were staying with my group from school..., it is like seeing a picture, I don't have any pictures of that time. It brought back my memories..., I think I am going to remember this and I will have another story to tell and a different appreciation of it'.

Furthermore, the memories also created positive feelings and emotions for P14 as further stated,

'I feel like, when I was doing the VR experience, I was just thinking about, it was not just Dave and my family, but like me spending time with my family. That is what I was thinking about. It is really nice to come here and spend time with my family. My feelings are like happiness and warmness'

Overall participants enjoyed their novel experience at the destination and showed positive feelings and emotions while and after using VR.

Moreover, the VR experience was able to reproduce a very specific memory which could only be provided by the fully immersive VR experience and in combination with the 'bird's eye view'. For instance, P10 was practising hang gliding for many years and due to the VR, P10 remembered past times where he was active doing that sport.

'That was bringing back old memories, above the trees, off the hill tops, that was my view when I was running off the top with the hang glider and looked down above the countryside. In fact, it was such close to tree tops I had the old feeling again.'.

Thus, VR offered this unique experience which cannot be replicated compared to any 2D media such as showing a video or pictures. Furthermore, VR brought back memories about places visited in the past. For instance, P1 recalls childhood memories about the Honister pass and Tarn Hows,

'I was driving the van up and down the little roads and I could not remember all clearly..., I was thinking about the family walks we used to have in Tarn Hows, I was going them through again as we mentioned driving the van through Honister'.

Moreover, shared VR experience can bring memories back which cannot be relived anymore such as in this case, where a partner got handicapped and thus is not able to access many places physically. As P22 and P23 described, this time is the first time where one partner is in a wheelchair but had been to the LDNP many times in the past where both were actively exploring the place,

'We found alternatives that we have enjoyed but seeing VR as well is kind of pretty nice to get that perspective because I know I can't get up to myself. It is nice to be able to have at least the memories and what the view is like. And it is nice that Chris gets to see that because he does not go on his own. He stayed down. It nice to remember and think about things what we did do and enjoy it again.'.

The participants' interviews showed that VR can bring memories back and make them more alive compared to a 2D medium. By having the opportunity of seeing the place in 360-degree participants can choose what they want to see and thus based on their past and current memories telling and sharing their own stories.

VR and memory have been applied to different research areas. For instance, in psychology, as shown by Sauzéon, et al. (2016), VR can be used to increase the memory effect by simulating real-life situations and exploring how age and navigation effects can influence episodic memory. Similarly Ouellet (2018) propose a virtual shop

to assess memory in daily life for young and old people. Moreover, in neuropsychology as Weniger et al. (2011) presented VR is applied to examine spatial memory deficits with amnestic mild cognitive impairment. Further, also stroke patients may benefit from VR where situations created within VR can test a patient's prospective memory abilities (Brooks et al., 2004). Further, it can be a general tool for people with brain injuries, schizophrenia or dementia which can simulate realistic and dynamic environments to explore and enhance people's memory in terms of spatial navigation Cogné et al. (2017).

Furthermore, within an educational context, the authors Willemsen (2018) presented a memory task where VR shows an increased performance on recalling and finishing the memory matching task. Another example is demonstrated by Babu et al. (2018) that VR has an increased effect on memorising information even after a certain time has passed compared to a 2D environment. Likewise, Berki (2018) found within a marketing context that VR participants showed an increased recall of 2D advertisements within VR compared to the web-based environment. Within a marketing and tourism context, Marchiori et al. (2018) investigated heart rate data and people's perception of VR. The authors exposed people to different scenes and after their VR experience, the users were asked to recall the most preferred ones in two different time points and results were compared to their heart rate and emotional response. Moreover, triggering memories in VR also showed that it can evoke positive emotions. For instance, Beck and Egger (2018) examined the objective and subjective emotional assessment by comparing the non-immersive desktop-pc version and the fully immersive VR of a 360-degree video of a winter destination. While the objective figures show a statistical difference between the groups, personal judgement did not. Another study by Felnhofer et al., (2015) applied various virtually created parks to evoke a certain type of emotion such as joy, sadness, boredom, anger and anxiety. Further, each park had a different theme representing those emotional states. The results show a statistical significance for four out of five parks and hence, VR was able to reproduce the intended emotion for nearly every scenario. Hence, by remembering certain events, tourists might also recall other situational factors that affected their emotional state. As the examples showed, emotions can be reproduced that was felt in that particular situation.

The effect of VR and memory has been mostly applied within psychology, medicine, neuroscience and in an educational context. However, within a tourism context research is scarce and under-researched. The novelty of this theme shows how VR has a positive effect on domestic tourists' memories while being at a rural destination. Particularly, VR enables tourists to view the landscape with their own personal and shared experience and interpretation of the rural place made in the past. This allows tourists at the destination who have a different mindset on-site to remember previous visits and consequently to relive the past and the present stay. It further enables tourists to complement and enhance their memories during their stay at the LDNP by seeing the place from a different perspective which they can never experience within the physical environment. Consequently, VR might reinforce and strengthen their attachment to place by providing this novel experience at the place. Since memories are important and tie people to places (Scannell and Gifford, 2010a; Strong, 2017) it can be hypothesised that:

H8: Memories positively influence Increased Place Attachment.

6.10.2. Increased Place Knowledge

One identified theme of the qualitative findings is 'Increased Place knowledge". Based on the enhanced visual perspective participants were able to increase their knowledge about the place and update their image about the Lake District. This was mainly described as the VR experience provided a new and unique perspective by seeing the Lake District from an 'birds-eye-view'. Based on participants response, participants' feedback about looking at the place from a different perspective and angle were perceived very positively and allowed them to see the place in a way that it is not possible to experience while walking on the ground. Many participants (n=13) valued the unique and new view which was provided by a drone flying over the Lake District. Especially intriguing was the possibility to be able to have a 360-degree view of the different places. Therefore, the enhanced knowledge about the destination was mainly driven through this unique experience that was provided in VR.

For instance, P17 pointed out that,

"...I have been to Grasmere before obviously, but I have never seen it like this before. It is just amazing and just to see a view like that you would never see unless you are actually flying."

Furthermore, participants found that this new and rare perspective allows a novel visual experience of seeing known places. Therefore, VR allows participants to get this unique perspective of those places within the LDNP as P22 described,

"I love to see it from a different perspective, obviously from a drone, which is quite different what you see from the ground. So, it is quite different and interesting..., You get a better of view of, so you have done a walk and you have seen the park, but it gives you the whole perspective and not just an individual snapshot. You get a better perspective where you have been and what you have seen."

Moreover, VR gave participants (n=6) to see a more in-depth perspective and thus enabled to discover more details than being physically there. Further, they described that VR provided an enhanced view and captured more landscape details compared to reality or to 2D images. In this line, P16 and P17 found that,

'You can see everything as it is. You can see more than in reality because of you are in the air and you are above the trees'.

Additional VR also provided more details such as colours, texture and the possibility to see those details in 3D rather in a static form. For instance, P22 and P23 found that, *'It looks greener in the VR than it does in reality', 'It is quite realistic I think, if it is sunny you get all the kinds of greens and you got all of those in the VR. It does not make things uniform coloury, just picks everything out, very nice. From that perspective it is so much more real than seeing it on a photo because you cannot get all these different colours, more distinction'.*

On one hand, a few participants (n=5) discovered new places such as Tarn Hows where they were not aware of its existence or have not been there yet. On the other hand, new information enriched the existing representations of locations and landscape elements as P7 described that,

'The only place we have not seen was Tarn Hows and that is the only place we have not been before, and it was good to see what it looks like'.

On the contrary, new knowledge about known places added new information to it and provided a more complementary picture as P17 argued,

'I have never seen Grasmere like that, I have been to the village, but I have never realised how close it is to the lake side and the rest of it', I know more about the place now'.

Furthermore, tourists also seriously considered to alter their current travel plan and to visit the VR location they had recently experienced. For example, P17 travelled with her children to the Lake District and had a pleasant VR experience. She enjoyed VR and the places that she had seen and based on that VR experience P17 stated (Pantelidis, 2019, p. 389):

"But now I really want to take them there, after seeing it so, we take them to Grasmere now".

In addition, P2 also changed the travel plan during the VR experience as P2 argued (Pantelidis, 2019, p.389):

"I would visit Buttermere anyway but it kind of make me to want to see Grasmere, it looks quite nice".

Another interesting aspect of VR was made by P18. The VR experience showed P18 a known location of the Lake District. However, because the place was shown in a different perspective, P18 decided to return because it differed from the previous visit. Hence, as P18 described her image of Tarn Hows (Pantelidis, 2019, p.389):

"...but it did not look what I thought it was supposed to be. So, this is one area I would like to look up and see where it is and walking there".

A few participants (n=5) stated their intention to return to the Lake District and to travel to the location they have experienced in VR. One of the reasons to return was because of all the details they had missed in the past or had no awareness about them (e.g. size of the area). Therefore, VR encouraged participants to discover the Lake District in the future. For example, P21 stated (Pantelidis, 2019, p.389):

"The place looks really nice and I want to go to visit all the places in the VR. I have been more to the main. Looking at them makes me want to come back next time".

Moreover, the place Tarn Hows in the Lake District was unfamiliar to P4 and based on the VR experience P4 argued (Pantelidis, 2019, p. 389):

"I think there are a couple of places there where I have not been to and I think it possibly I would like to actually investigate those places in future, like Tarn Hows. I have never heard about it before, but it would be nice to see".

This increased information might lead to explore those new places or to revisit the known ones and to see them from a different angle. Immersive 360-degree technology such as VR allows a greater visual view compared to a desktop-based application (Calderwood, 2009, Loomis, 2016). Especially the 'birds-eye view' provides a great opportunity to see the place from above which can be considered as a rare and very realistic view. Further, it seems to be popular and shows a higher emotional stimulation compared to other VR scenes (Marchiori et al., 2018). Regarding the cognitive skills, realism within VR may increase people's spatial cognition and therefore, for instance, VR has a positive impact on people's navigational skills (Meijer et al., 2009). Furthermore, by adding details to a VR application such as to simulate buildings or functions of a building, VR can help to gather specific results of existing and non-existing environments and to gather important information as shown by Heydarian and Becerik-Gerber (2017).

Moreover, serious games within VR can also increase knowledge by providing interesting and appealing software and hence provide a novel training method for emergency safety (Feng and Xiao, 2018). In a cultural context VR may reproduce VE and thus provide details and a perspective that cannot be presented in the physical environment. This presentation in combination with useful information may be used by

VR to be applied as an educational tool and thus increase people's view, meaning or attitude towards a place (Carrozzino and Bergamasco, 2010; Kusuma et al., 2017). In this study, the new 'bird's eye view' was highly valued by participants and provided a unique view of the several landscapes and places within the LDNP. Moreover, since the VR represents a 360-degree representation of the real place, the realism within VR is given. Furthermore, participants gained new insights and information about the place which enriched their existing spatial map. Firstly, seeing new places increased their overall understanding of the Lake District. Secondly, participants were able to see details of known places or surroundings and hence, expanded their perspective of those places. Moreover, this view enables participants to observe beautiful landscape aspects and thus, it might increase the meaning of the place. These cognitive aspects are important to establish bonds between people and places where holding information about a place adds to its character. This special character of a place relates to someone's beliefs and identity which in turn is important to develop an attachment towards a place (Scannell and Gifford, 2010a). Therefore, it is hypothesised that: H9: Increased Place Knowledge influences increased Place Attachment.

6.11. Proposed Research Model

Based on the qualitative analysis and the developed hypotheses a PA framework is proposed. Furthermore, as discussed in the chapter (2.7), this framework follows a formative-reflective model.

6.11.1. Proposed Model and Hypotheses

The following table presents all formulated hypotheses and is summarised in the following table (6.9).

	Hypothesis	Theme
H1	Aesthetics positively influences Presence	Aesthetics
H2	Aesthetics positively influences Memories	Aesthetics
H3	Atmosphere positively influences Presence	Atmosphere
H4	Atmosphere positively influences Memories	Atmosphere
H5	Accessibility positively influences Presence	Accessibility
H6	Accessibility positively influences Memories	Accessibility

Table	6.9:	Overview	of Hv	pothesis
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H7	Presence positively influences Increased Place Attachment	Presence
H8	Memories positively influence Increased Place Attachment	Memories
H9	Increased Place Knowledge positively influences Increased Place Attachment	Increased Place Knowledge
H10	Increased Place Attachment positively influences Increased Intention to Revisit	Increase Place Attachment
H11	Place Attachment positively moderates Presence on Increased Place Attachment	Place Attachment
H12	Place Attachment positively moderates Memories on Increased Place Attachment	Place Attachment
H13	Place Attachment positively moderates Increased Place Knowledge on Increased Place Attachment	Place Attachment

In addition to the hypothesis, two new latent constructs were proposed based on the literature to develop the model. In order to explore the effects of VR and to investigate if the VR experience has an impact on tourists' attachment level, the latent constructs 'Increased Place Attachment' was created. For that purpose, PA items were reformulated to capture the increased attitude. This approach is newly presented for this study. An additional latent variable refers to the increased intention to revisit which also contains reformulated items to capture the increased attitude. In this sense, an intention to revisit to a destination can be defined as a probably future decision to return to the same destination (Hallmann et al., 2015). According to Chen et al. (2014), tourists stay a short time period in a place and have a dynamic relationship and thus cannot rely on conventional measurement. Thus, the tourist experience at the destination also creates future expectations. These expectations can be expressed in returning to the destination as PA stimulates proximity seeking to the place (Scannell and Gifford, 2014b) resulting in visiting the same destination (Morais and Lin, 2010). Therefore, this study hypothesises that an increase in PA may also lead to an increased intention to revisit the destination. Moreover, as suggested in the literature (Gross and Brown, 2008; Stylos et al., 2017) PA as a moderator variable is barely applied, but important to provide more nuanced insights into how PA regulates tourists' attachment. Therefore, to explore how PA is affected by the VR experience, this study proposes PA as a moderator variable to identify to what extent the existing level of attachment is guiding the VR experience. Based on the formulated hypotheses and

the syntheses of the literature the following figure 6.2 provides the proposed PA framework that is representing objective two of this study. Furthermore, this PA model also informs the quantitative analysis to test and propose the final PA framework. Thus, achieving objective three of this research.



Figure 6.2 Developed PA Framework based on the Qualitative Analysis and Literature Review

Overall, there are 13 proposed hypotheses with nine latent constructs. The PA framework indicates that aesthetics, atmosphere, and accessibility have a positive impact on presence and memories. A direct effect on increased PA is represented by presence, memories, and increased place knowledge. Further, increase PA is argued to have a positive effect on increased intention to revisit. PA is applied as a moderator variable meaning exploring the relation of presence, memories, and increased place knowledge on increased place knowledge on increased place knowledge.

6.12. Summary

This chapter outlined how the qualitative research stage was executed and presented the qualitative findings by analysing the interviews of tourists in the Lake District. Thematic analysis was applied, and several themes were identified. Overall, the interviews revealed six themes, aesthetics, atmosphere, accessibility, presence, memories and increased place knowledge. Based on the initial findings, the literature review and two additional constructs were created to finalise the proposed PA framework. Considering the relationship of the model and the moderation effect of PA a total number of 13 hypotheses were formulated. This chapter was the first step of the mixed method design and findings were used for chapter 7 where the proposed model will be tested.

Chapter 7 - Quantitative Research stage – Questionnaire

7.1. Introduction

To achieve the third objective of this study a quantitative research step was applied to test the proposed model developed and extended from the qualitative stage and literature review. This chapter outlines the process of how the quantitative research was implemented. In addition, to test the proposed model a variance-based Structural Equation Modelling (PLS-SEM) was applied. (Hair et al., 2016).

7.2. Instrument design

To test the proposed theoretical model and to examine relationships among variables a survey approach was applied. A self-completed questionnaire was used to collect quantitatively via Likert scales tourists' responses to standardised questions (Saunders et al., 2018). This is according to Scannell and Gifford (2014b) the most used tool in PA to capture people's level of attachment since cognitive-emotional aspects are difficult to observe. Therefore, a self-reported questionnaire is a suitable way to gather information about peoples' feelings, thoughts and motivations.

The initial questionnaire was developed by reviewing the literature and identifying suitable scales for the construct variables which were applied in previous studies. Further constructs were incorporated based on the thematic analysis of the qualitative research stage, and suitable scales were again identified (Appendix 5). The questionnaire was composed of two main parts. The first part measured PA which was informed by the literature representing the formative construct (van Riper et al., 2019). The three latent construct variables measuring PA formatively are 'Place Identity', 'Place Dependence' and 'Social Bonding' representing reflective constructs.

The second part represented themes from the qualitative analysis and literature (Presence, Memories, Aesthetics, Atmosphere, Accessibility and Increased Place Knowledge). To measure these reflective constructs, scales were obtained from the literature and developed from participants' responses and then accommodate the VR context. Adjusted measures of a construct for the increased effect of VR on PA (Increased Intention to Revisit and Increased Place Attachment) were also added. Lastly, a marker variable was included to test CMB as suggested by Kock and Lynn (2012). After final adjustments were made the following table 7.1 provides an overview of the formative and reflective measurements used in this study.

Table 7.1 Overview of Formative and Reflective Measurements

Construct	Source	
Formative Measurement Constructs of PA		
Place Identity	Yuksel et al. (2010); Chen et al. (2014);	
Place Dependence	Ramkissoon et al. (2014)	
Social Bonding		
Reflective Measurement Constructs		
Presence	Makransky et al. (2017); Vorderer et al. (2004);	
	Slater et al. (1994); Slater and Wilbur (1997)	
Memory	Correia Loureiro (2014); Fitzgerald and	
	Broadbridge (2013); Jorgenson et al. (2019)	
Aesthetics	Kirillova et al. (2014); Blijlevens et al. (2017) and	
	from participants' responses	
Atmosphere	Developed from participants' responses	
Accessibility	Developed from participants' responses	
Increased Place Knowledge	Developed from participants' responses	
Increased Place Attachment	Ramkissoon et al. (2014)	
Increased Intention to Revisit	Kim 2018; Stylos et al. 2017	

*Full items are provided in Appendix 5

Furthermore, all scale items of the latent constructs were measured on a 7-point Likert-Scale basis allowing people to have a wider range of options and leading to higher reliability and validity scores compared to lower ranges (Preston and Colman, 2000). At the end of the questionnaire questions captured participants' VR experience, the frequency level of travelling to the Lake District, the type of company that they like to travel with, date of birth and postal code.

7.3. Pilot Study

The pilot study was conducted to test the main quantitative phase data collection. In this respect, the aim was to identify potential problems such as wording issues to increase response rate and accuracy. Therefore, the pilot study helped to apply changes before the survey (van Teijlingen and Hundley, 2004).

For the pilot study of the quantitative stage, a total sample size of 35 was collected among students who have visited the Lake District in the past. The reason for including students in the pilot study was driven by limited resources but also because of the holiday season at the Lake District. Hence, fewer tourists and bad weather would have impacted the data collection process negatively. Therefore, a more practical approach was chosen to include solely students to test the developed questionnaire. The respondents were 71.4 % male (n=25) and 28.6 % female (n=10) with an average age of 26 years (SD=7.9). Most of the respondents sampled visited the Lake District with their families, followed by respondents travelling with friends or partners. Over 80% of the sample visited the LDNP over 6 months ago while almost 9 % are weekly visitors.

Gender	n	%	
Male	25	71	
Female	10	27	
How did you travel to the LD?			
Family	16	46	
Friends	11	31	
Partner	5	14	
Other	2	6	
Solo	1	3	
The frequency of visiting the Lake District			
Over 1 year	21	60	
Between 6 and 12 months	8	23	
Weekly	3	9	
Between 3 and 6 months	2	6	
Between 1 and 3 months	1	3	

The overall previous VR experience of the pilot sample indicated that most of the respondents had limited previous VR experience.

7.3.1. Reliability Analysis of the Pilot Study

According to Bryman (2015) reliability refers to the consistency of a measure of concept. Internal reliability, one aspect of measuring reliability, describes the internal consistency of a scale. As Bonett and Wright (2015) argued, internal consistency includes the measurement of one construct by several questionnaire items or test items. The most commonly used test for internal reliability is 'Cronbach's Alpha' (Bryman, 2015; Bonett and Wright, 2015). To measure the internal consistency, the questionnaire items for each scale were tested to reveal the Cronbach's alpha value of each construct. The coefficient of Cronbach's alpha is considered acceptable if it exceeds a value higher than .70 (Nunnaly and Bernstein, 1994). The following table was conducted by calculating the Cronbach's alpha in SPSS for each scale and item.

Table 7.3 Reliability test of scales of the questionnaire (Cronbach's alpha)

Construct Name	No. Of items	Cronbach's alpha
Place Identity	7	0.89
Place Dependence	7	0.90
Affective Attachment	6	0.86
Social bonding	4	0.88
Presence	5	0.87
Aesthetic	4	0.85
Memories	8	0.92
Atmosphere	6	0.83
Accessibility	3	0.76
Increased Place knowledge	5	0.89

The table provides an overview of all constructs that were measured with several questionnaire items. All Cronbach's alpha scores are above 0.70 indicating that the questionnaire items are consistently measuring the corresponding constructs. Hence, the reliability analysis for the pilot study indicated no issues with the scales.

7.4. Sampling

In quantitative research, probability sampling or representative sampling is most frequently used in survey research allowing the researcher to make inferences to the population based on the chosen sample (Saunders et al., 2016). The population has to be specified and evaluated to ensure it is appropriate to the research question (Bryman, 2015). According to Altinay et al. (2015), random sampling within probability sampling aims to reduce biases to overrepresent or underrepresent a certain member of a population and hence allow generalisation of sample results to the population. An overview of random sampling techniques is provided in table 7.4:

Probability sampling	Characteristics
Simple random	The population is defined with a sample frame of n cases. The sample size is selected randomly by assigning each case with a number and therefore, each participant has equal chance to be chosen.
Systematic random	Similar to simple random, however the sample is chosen by a systematic way such as every 10th case of the sample frame.
Stratified random	Population is specified by a certain criterion and then simple or systematic sampling is applied.
Cluster	Population is divided into groups where groups representing the sample frame. They are selected randomly, and each case is selected of the group.
Multi-stage	A development of cluster sampling by applying another cluster within the first cluster and hence having subgroups. Afterwards random sampling is applied on subgroups.

Table 7.4 Overview of Probability Sampling

Source: Saunders et al. (2016); Bryman (2015).

To select a sample, a sampling frame provides a list of all units that can be selected within the population. (Bryman, 2015). However, to ensure a representative sample

the sampling frame has to be available and hence random sampling may be not always applicable. In this study, convenience sampling was applied which is a non-random sampling strategy often used in social science (Bryman, 2015). It is argued that convenience sampling can be quick and cost-effective compared to other sampling strategies (Jager et al., 2017). In some cases, representative sampling is challenging, and convenience sampling is necessary. For instance, Poku and Boakye (2019) argued that tourists at the destination are in a state of travelling and therefore defining the sample frame from which to choose participants is impossible. Likewise, Yang et al. (2015) also applied a non-probabilistic sampling is often used also at rural destinations due to the inability to capture the sample frame of the population as showed by various authors (Goh et al., 2017; Amoah et al., 2019; Poku and Boakye, 2019).

According to Hindsley et al. (2011) within a recreational context, conducting a study onsite represents mostly participants with different characteristics compared to the population and therefore researchers must account for the bias that comes from nonrandom sampling. This discrepancy between the sample and the population can be explained by two aspects. The first aspect involves the selection bias driven by the likelihood of participation being based on the potential participants onsite. The second aspect referred to a higher chance of being sampled due to a participant having high use of the recreational site (Hindsley et al., 2011). Therefore, convenience sampling does not allow the researcher to generalise because it is not known what population the sample represents (Bryman, 2015). Despite the disadvantages of using convenience sampling, there are ways to minimise some of the biases. For instance, according to Skowronek and Duerr (2009), researchers can try to include a representative sample of the population by having a sufficiently large sample size. Furthermore collecting data on different days and times may enhance convenience sampling. For example, Yang et al. (2015) and Poku and Boakye (2019) aimed for equal distribution of gender when collecting data.

To reduce biases, this study tried to include a variety of participants. For instance, the data collection took place over the entire day usually starting from 1000 to 1900 hours capturing all types of tourists' that have a different time preference when partaking in holiday activities. Regarding the place, only one place namely Windermere/Bowness

was chosen for the sampling. On the one hand, this could be argued as a limitation since the Lake District has many interesting places where tourists like to travel. On the other hand, Windermere/Bowness is a small town where most tourists come across to either explore areas by bus, boat or to relax and to have a break. Therefore, Windermere/Bowness provided access to a number of tourists located in a central place. Furthermore, this study aimed to achieve an equal distribution of gender and to include a wide range of ages.

7.5. Sample Size

In quantitative studies, small sample size may bias results (Goodhue et al., 2012). Therefore, a sufficient sample size reduces the error margin and allows to make of statistical inferences about a study's population (Saunders et al., 2018). This study used partial least square structural equation modelling and the literature recommended different rules about the required sample size. For instance, the 'rule of 10' suggested 10 cases per measured variable of the biggest latent factors block or 10 cases per arrow showing to a dependent variable with the most arrows (Chin, 1998). Following this approach, the required minimum sample size for the study would consider 40 or 50 cases as sufficient. Further, Reinartz et al. (2009) argued a high statistical power can be achieved with a sample of 100 or with a sample size of 200 (Afthanorhan, 2013). However, a more popular approach is given by Hair et al. (2017) following the rules of power analysis for multi regressions by Cohen (1992). This suggests that a minimum sample size of 158 cases is acceptable given the constructs of this study, considering the level of power of 0.8, at a significance level of 1 % and minimum R² of 0.1. For the same factors with a significance level of 5 %, which is typical in tourism studies, a minimum sample size of 113 cases is considered sufficient. Following the approach by Hair et a. (2017) the study's final sample size of 168 cases was above the minimum required sample size adding to the statistical robustness of the quantitative analysis.

7.6. Data Collection

After the pilot study was analysed, the items for each latent variable and indicator variable were adjusted to develop the final questionnaire for this study (Appendix 6). The responses to the final surveys were collected at Windermere/Bowness at the Lake District National Park in May 2019. As in the qualitative stage, the Samsung VR Gear with the same application was used. Tourists were approached and asked if they were

willing to take part and to ensure they met the criteria for participating in the study. After agreeing to take part the survey process was explained, and any further questions from participants were answered. Subsequently, the questionnaire was distributed including the consent form and all relevant information about the purpose of the study which was signed by each participant. The first part of the questionnaire involved questions aimed at capturing tourists' existing PA before the VR experience took place. Afterwards, the second part of the questionnaire commenced covering the remaining questions. To avoid missing data, it was ensured that each participant had answered all questions.

7.7. Data Analysis

Within quantitative data analysis, a distinction can be made between univariate, bivariate and multivariate analysis. In this respect, univariate refers to the analysis of one variable, bivariate to the analysis of two variables and multivariate analysis to the analysis of three or more variables (Bryman, 2015). In this sense, also PA studies use scale measurement, regressions analysis, variance analysis and also structural equation modelling to investigate PA (Hernández et al., 2014). In this study, the multivariate analysis structural equation modelling (SEM) approach was used since the measurement included several conceptual variables and hypotheses were formulated about their direct and mediational causal relationships (Smith, 2000). In this respect, a structural model relates to the anticipated conceptual relationships between constructs from theory. This theory is then empirically measured by structural parameter estimates (Hair et al., 2014a). Moreover, there are two types of SEM techniques that can be applied. The first method refers to a co-variance approach (CB-SEM), while the second option refers to a variance-based partial least square technique (PLS-SEM). A more holistic overview of the key difference is presented in table 7.5:

CB-SEM	PLS-SEM
Based on covariance	Based on variance
Strict rules and assumptions:	A higher flexibility of rules and assumptions:
Assumption of normal distribution.	No assumption about data distribution.
Non-recursive model.	Recursive model (endogenous variables in
Minimum sample size.	sequence).
Reflective measures.	'Smaller' sample size.
Goodness-of-fit criterion.	Reflective and formative measures.
Accommodates metric data.	No universal goodness-of-fit criterion.
Theoretical underpinnings of how constructs are	Possibility to have non-metric and single-item
related \rightarrow confirming theory	types of data.

Table 7.5 Key differences between CB-SEM and PLS-SEM

Successful in handling of more complex models
\rightarrow exploratory research approach

Source: Hair et al. (2012); Hair et al. (2014); Oom do Valle & Assaker (2016). One reason why PLS-SEM has achieved high popularity to build advanced and complex models is due to its flexible requirements and its power to apply formative models when compared to CB-PLS (Becker et al., 2012; Robins, 2012). This popularity has also reached tourism research with an increased number of studies applying PLS-SEM (Oom do Valle and Assaker, 2016). According to Hair et al. (2014b), key factors for using PLS-SEM were the use of non-normal distributed data, small sample size and the application of a formative model. In a tourism context, as identified by do Valle and Assaker (2016), the predictive analysis capability of PLS was also perceived as a key reason for its use. However, there has also been criticism of studies exploiting the less strict requirements and applying PLS-SEM inappropriately (Hair et al., 2013; Marcoulides and Saunders, 2006).

Following the explorative nature of this study, the recent use of PLS-SEM in PA and tourism as well as its applicability to formative variables, PLS-SEM was applied. In particular, this study followed a Reflective-Formative Model of PA where the first-order variables were considered reflectively, and the second-order variable was considered to be formative (Becker, 2012). In this sense, the next logical step was to follow the systematic evaluation process of PLS-SEM modelling as shown in table 7.6 (Hair et al., 2017).

Stage	Description
Reflective Measurement Model (First-order constructs)	Internal consistency (Composite reliability); Convergent analysis (Average variance extracted); Discriminant validity
Formative Measurement Model (Second-order constructs)	Convergent validity; Collinearity between indicators; Significance and relevance of outer weights
Evaluation of the Structural Model	Coefficient of determination (R ²); Size and significance of path coefficients, path coefficients and effect size (f ²).

Table 7.6 Systematic Evaluation of the Reflective-Formative PLS-SEM Model

Source: Becker (2012); Hair et al. (2017)

Within PLS-SEM, the most important tests of the reflective construct variable measurement model are reliability, convergent validity and discriminant validity – these

tests need to be met before evaluation of the structural model (Hair et al., 2017). Similarly, for the formative construct variable measurement model, the most important tests are convergent validity, collinearity between indicators, statistical significance and relevance of outer weights – and again these tests need to be met before evaluation of the structural model (Hair et al., 2017).

7.8. Quantitative Analysis – Partial Least Square Analysis

This chapter provides an overview of the quantitative research stage of this study. In particular, the analysis focuses on the integration of the qualitative findings and the literature review. The PA model from the literature serves as the foundation and it is extended by the qualitative analysis. In this sense, this chapter presents the findings of the quantitative analysis corresponding to objective three. This includes validating the proposed PA framework with a total relationship of 9 latent variables resulting in 10 hypotheses. The measurement represents a structural relationship model and applies a partial least square analysis. This chapter starts with exploring the quality of the data set and is followed by the descriptive analysis. Further steps are included to establish the reliability and validity of the proposed PA framework. Subsequently, the significance of the overall model and main results are presented.

7.9. Data Screening

A total of 168 questionnaires were completed and used for the analysis of the quantitative research stage. Before starting with the analysis, it is important to ensure that the data set is complete, accurate and meets the requirements for the selected statistical analysis approach (Martin and Bridgmon, 2012). In this sense, data needs to be checked for missing values, extreme values or normal distribution (Hair et al., 2017).

7.9.1. Missing and Extreme Values

To explore the data set, the variables are entered into the statistical software IBM SPSS 22. The first step includes ensuring there are no missing values. However, this issue was addressed during the sampling phase by constantly checking for missing values. Hence, this data set has no missing values identified. Furthermore, all latent variables are measured in Likert-scale and therefore, the accuracy of the data is established by checking the minimum and maximum values. This ensures there is no

incorrect entry of data exceeding values of the scale between one and seven. For this reason, all variables have been examined in SPSS by checking the minimum and maximum range of values. The analysis shows no values exceeding the Likert-scale range. Hair et al. (2017) argued, the Likert-scale values are capped within a given range and thus, do not represent extreme values. Rather it is argued that they are considered to be part of tourists' subjective opinion and therefore, expressing their reality. Nevertheless, outliers and the corresponding case have been examined by checking boxplots in SPSS to identify unwanted answer pattern behaviour (Hair et al., 2017). The analysis of the boxplots reveals no further issues.

7.9.2. Distribution of Data

A common assumption for parametric statistical tests includes the normal distribution of data (Field, 2013). However, PLS-SEM is a non-parametric test and hence, normal distribution of data is not required (Hair et al., 2019). Nevertheless, as Hair et al. (2017) propose, it is recommended to check for normality since extremely skewed data might be problematic and normal distribution is still desirable. For this purpose, the skewness and kurtosis of variables are to be examined. In this sense, skewness refers to the degree of the symmetry of the variation, whereas kurtosis refers to the level of how peaked a distribution is (Martin and Bridgmon, 2012). According to Leech et al. (2008), a variable can be identified as normally distributed if the skewness and kurtosis values are between +/- one. The model of this study contains 41 indicator variables or measures. The skewness and kurtosis values have been analysed in SPSS and revealed 12 variables exceed at least one of the values. Furthermore, and more importantly, PLS-SEM does not require normal data distribution and studies demonstrate the robustness of this technique when data is skewed (Henseler and Chin, 2010; Kock, 2016; Hair et al., 2019). Hence, the issue of data distribution can be considered less problematic, also because the great majority of variables are normally distributed.

7.10. Descriptive Analysis

Descriptive statistics allows getting an overview of the variables in the data set. In this sense, the first step to analyse the key characteristics of the sample includes providing information such as the mean, median, mode and frequency of cases (Field, 2013). In

this respect, the following table 7.7 presents descriptive information about the sample of this study in terms of demographics, travel behaviour and previous VR experience. Table 7.7 Sample - Descriptive Analysis

	n	%
Gender		
Male	80	48
Female	88	52
With whom do you travel to?		
Partner	107	44
Family	77	32
Friends	45	19
Solo	9	4
Other	5	2
Age Groups		
18-25	38	23
26-35	37	22
36-45	31	19
46-55	24	15
56-65	24	15
66 and older	12	7
How often do you travel to the Lake D	District?	
Weekly	11	7
Monthly	13	8
Between 1 and 3 months	18	11
Between 3 and 6 months	22	13
Between 6 and 12 months	38	23
More than 1 year	66	39
Previous VR experience of participan	ts	
Very inexperienced	89	53
Moderately inexperienced	19	11
Slightly inexperienced	13	8
Neutral	11	7
Slightly experienced	17	10
Moderately experienced	11	7
Very experienced	7	4

Commencing with the gender distribution of this sample, the data shows 52% of the participants are female and 48% are male. Thus, there is an almost equal share of female and male participants in this study. In terms of the distribution of the age, the range of this data set starts from 18 with the youngest and the oldest participant is 84 years old. The average age of the participants is 40.6 years with a median value of 38 years. Concerning age groups, the majority of tourists were located in the age group

of 18 to 25 while the smallest number of participants were in the group 66 years old and older. This sample represents a great variety of participants of all ages.

The next variable explores the average number of trips that tourists undertake to the Lake District. The sample shows that 61 % of tourists visit the Lake District at least once a year compared to 39 % where the last trip is more than one year ago. A small percentage of participants indicate visits to the Lake District on a weekly (7%) and monthly basis (8 %). However, most of the tourists who travelled to the Lake district within a year report returned between six and 12 months. The majority of tourists preferred to travel regularly to the Lake District National Park. With regards to previous VR experience, the majority of tourists did not have any experience of VR technology. Only around 21 % of participants indicate they have used VR in the past or are familiar with the VR technology. Hence, many tourists had their first VR experience within this study. Finally, about travelling in groups or solo, participants were able to select more than one option. The majority of tourists indicate they travel with their partner (44 %) or with their family (32 %). Almost 20 % indicate they travel with friends, whereas only 4 % travel alone. The great majority (of over 75% of those interviewed) travel with their partner or family to the Lake District.

7.11. Empirical Analysis - Hierarchical Latent Variable Model

The empirical model of this study is a partial least structural relationship model measuring the relationships between variables. PA represents a hierarchical component model or higher-order model indicating to have more than one layer of latent variables. In this respect, the second layer is called a second-order construct (higher-order model) which is explained by the first-order constructs (lower-order model). Hence, it summarises first-order latent variables into a single multi-dimensional latent variable (Hair et al., 2017).

Furthermore, latent variables can be measured by a reflective measurement model or a formative measurement model. A key characteristic of reflective models refers to latent variables that are reflected through their indicators (measures) rather than being formed by them (Diamantopoulos and Winklhofer, 2001). Therefore, following the visual representation as shown in figure 7.1 the arrows are pointing from the latent construct to the indicator variables.



Figure 7.1 Reflective Measurement Model Source: Becker et al. (2012).

In contrast, in formative measurement models, the indicator variables form the latent variable (Diamantopoulos and Winklhofer, 2001). Hence, the causal relationship is assumed from the observed variable to the latent construct (Henseler, 2010). As shown in Figure 7.2 the arrows are pointing from the indicator variable to the latent variable.



Figure 7.2 Formative Measurement Model Source: Becker et al. (2012).

Based on the proposed model of this study, the PA measurement model is presented as a Reflective-Formative model (Becker et al., 2012). This indicates that the lowerorder variables are measured reflectively while the second-order PA variable is 'formed' by the lower order latent variables - as shown in Figure 7.3.





The remaining variables of the model are considered lower-order variables and measured reflectively. Therefore, to assess the PLS-SEM measurement model of this study, a two-stage approach is followed. Firstly, the reflective measurement model is assessed and secondly the formative model (Becker et al., 2012).

7.11.1. Assessing the Reflective Model – First-Order Construct

The following Figure 7.4 presents an overview of the steps required to assess the reflective measurement model.



Figure 7.4 Key steps to evaluate the reflective measurement model Source: Hair et al. (2017).

To establish the reliability and validity of the reflective measurement model three aspects are considered - Internal Consistency Reliability, Convergent Validity and Discriminant Validity.

7.11.1.1. Internal Consistency Reliability

Internal consistency is based on the interrelationships between the indicator variables and assumes that similar indicators are highly correlated on the same construct (Hair et al., 2017). According to Bonett and Wright (2015), the most applied reliability score for measuring internal consistency is Cronbach's alpha. Another reliability score, as Hair et al. (2014) showed, relates to the composite reliability and is argued to be more appropriate for two reasons. Firstly, composite reliability does not assume that all indicator loadings are equal in the population and secondly, it is less sensitive to the numbers of indicators whereas Cronbach's alpha tends to underestimate the reliability. However, according to Hair et al. (2017), the composite reliability can overestimate the reliability and therefore it is recommended to report both scores. The true score is bounded - where Cronbach's alpha represents the lower bound and the composite reliability score represents the upper bound (Hair et al., 2017). The following table 7.8 provides an overview of all first-order constructs with mean values, standard deviations, loadings value, t-values and the composite reliability score and Cronbach's Alpha scores.

Construct Items	Mean	Standard Deviation	Loading	t Values	Composite Reliability	Cronbach's Alpha	AVE
Access					0.901	0.836	0.752
ACC_1	5.92	1.12	0.894	41.934			
ACC_4	5.97	1.07	0.880	36.964			
ACC_5	5.76	1.20	0.827	27.464			
Aesthetics					0.929	0.91	0.686
AES_1	6.12	1.13	0.805	23.641			
AES_2	6.17	0.97	0.850	31.166			
AES_3	6.32	1.05	0.793	19.763			
AES_4	6.44	0.87	0.821	22.289			
AES_5	6.27	0.89	0.808	22.546			
AES_6	6.44	0.83	0.835	22.590			
Memories					0.928	0.908	0.683

Table 7.8. Assessment of the Measurement Model for First-Order Constructs

MEM_1	5.43	1.45	0.787	27.904			
MEM_2	5.21	1.51	0.778	24.049			
MEM_3	4.72	1.84	0.881	26.936			
MEM_4	4.38	2.11	0.854	21.845			
MEM_5	5.29	1.62	0.864	44.089			
MEM_6	4.73	1.98	0.892	25.953			
Presence					0.868	0.868	0.872
PRE_2	5,32	1.31	0.867				
PRE_3	5,60	1.30	0.831				
PRE_5	5,69	1.43	0.854				
Place Attachment							
Place Identity					0.933	0.893	0.823
PI_1	4.46	1.79	0.904	57.870			
PI_2	4.49	1.71	0.895	48.030			
PI_3	4,15	1,904	0.923	75.634			
Place Dependence					0.918	0.866	0.789
PD_1	4.83	1.49	0.902	56.924			
PD_2	4.85	1.56	0.888	50.299			
PD_3	4.63	1.57	0.874	39.681			
Social Bonding					0.854	0.744	0.663
SOC_1	3,32	2,097	0.888	55.165			
SOC_2	4,37	1,830	0.824	30.215			
SOC_3	2,30	2,084	0.723	12.980			
Increased Place Knowledge					0.934	0.911	0.739
PK_1	5,46	1.42	0.873	38.014			
PK_2	5,43	1.41	0.851	31.371			
PK_3	5,32	1.55	0.890	48.754			
PK_4	5,27	1.50	0.869	43.934			
PK_5	5,39	1.35	0.813	27.226			
Increased Intention	to						
Revisit and Place					0.951	0 941	0 709
Inc. Intention PA 1	5.38	1.52	0.856	36.190	0.001	0.011	0.700
Inc Intention PA 2	5.38	1.52	0.859	34.205			
Inc_Intention_PA_3	5.31	1.43	0.852	39.241			
Inc_Intention_PA_4	5.02	1.59	0.870	37.488			
Inc Intention PA 5	5.05	1.68	0.889	47.026			
Inc. Intention $PA = 6$	5,13	1.38	0.829	32.884			
Inc Intention PA 7	4.76	1.62	0.865	40.897			
Inc Intention PA 8	3.98	1.97	0.704	13.841			
	0.00		1				

The analysis reveals that all reflective constructs show a high reliability score and exceed the minimum acceptable values of 0.7 for both Composite Reliability and Cronbach's Alpha (Hulland, 1999). In this way, the constructs are well explained by their indicators demonstrating the internal reliability of the first-order variables.

7.11.1.2. Convergent Validity

The convergent analysis demonstrates how an indicator correlates positively with other indicators of the same construct. Hence, indicators are supposed to converge or share a high quantity of variance (Hair et al., 2017). In this sense, the loadings of the items are supposed to be higher than 0.70 (Hulland, 1999) and statistically significant (Hair et al., 2017). Based on table 7.2 the t values are higher than 1.960 and statistically significant (p < 0.05). An additional benchmark represents the average extracted variance (AVE) as shown by Fornell and Larcker (1981), and significant values are expected to exceed 0.50. In this respect, the analysis shows both criteria for measuring convergent validity are satisfied.

7.11.1.3. Discriminant Validity

Discriminant validity determines how a construct differs from other constructs in the same model (Hulland, 1999). To measure discriminant validity, three approaches can be used such as the Fornell-Lacker criterion, cross-loadings and the heterotrait-monotrait ratio (HTMT) criterion (Ali et al., 2018). Based on these various approaches, according to Henseler et al., (2015), the Fornell-Lacker criterion and cross-loadings are dominant approaches within research but do not always accurately assess discriminant validity. Therefore, a more advanced approach using the HTMT criterion is recommended (Henseler et al., 2015; Hair et al., 2017). Discriminant validity values greater than 0.90 indicate a lack of discriminant validity (Hair et al., 2017). This study applies the HTMT criterion analysis following the procedure of Henseler et al. (2015) as shown in figure 7.5.


Figure 7.5 HTMT Criterion Analysis Procedure

Source: Henseler et al. (2015)

Following the above procedure, this study encountered two discriminant validity problems. Discriminant validity could not be established between the latent constructs of 'Aesthetics' and 'Atmosphere' and between 'Increased Place Attachment' and 'Increased Intention to Revisit". Operation of step three did not bring the HTMT score below 0.90. Therefore, step four was followed for both cases, and consequently, in

each case, the two constructs were merged. The theoretical justification for this is given below.

For the first case, the concepts of 'Atmosphere' and 'Aesthetics' can be perceived as similar since atmosphere and aesthetics aspects are very closely related (Biehl-Missal, 2013; Murray et al., 2019). In this sense, as both constructs defined during the qualitative analysis there were sharing elements such as being an emotional experience by appraising landscape elements. Hence, both variables capture the beauty and positive features of the landscape and there is theoretical support for them being merged into a single variable. The next two constructs, 'Increased Place Attachment' and 'Increased Intention to Revisit' are merged into 'Increased Intention to Revisit and Place Attachment'. In this case, theoretical support for the merger is given by the fact that PA is expressed through returning to the place (Scannell and Gifford, 2014b). This behavioural aspect of PA is also reflected within the definitional concept of intention to revisit and thus, both constructs imply a return to the destination. For this reason, both concepts show interdependence and therefore, an increase in PA conceptually also leads to an increased behavioural intention. Consequently, it is reasonable to merge these two constructs into a single variable 'Increased Intention to Revisit and Place Attachment'. After these changes, further analysis was carried out to establish discriminant validity. To achieve satisfactory results the HTMT ratios are supposed to be below 0.90 (Hair et al. 2017) as shown in table 7.9.

	Discriminant V	/alidity: ⊦	leterotra	it-Monot	rait Ratio	of Correl	lations (I	HTMT)		
		1	2	3	4	5	6	7	8	9
1	Accessibility	-								
2	Aesthetics	0.738								
3	Place Attachment	0.354	0.304							
4	Increased Place Knowledge	0.625	0.675	0.324						
5	Increased Intention to Revisit and Place Attachment	0.659	0.618	0.580	0.850					
6	Memories	0.572	0.480	0.696	0.563	0.744				
10	Place Dependence	0.380	0.377	1.000	0.347	0.582	0.666			
11	Place Identity	0.316	0.267	1.020	0.240	0.466	0.612	0.861		
12	Presence	0.793	0.839	0.793	0.839	0.477	0.770	0.458	0.429	
13	Social Bonding	0.287	0.192	1.029	0.324	0.579	0.669	0.748	0.842	0.445

Table 7.9: HTMT Ratios

Incorporating the changes and running the discriminant validity all values are below 0.90 and thus, discriminant validity for reflective measurements is established. The discriminant analysis is only important for reflective measurements and not does not apply for the formative measurements (Place Identity, Place Dependence and Social Bonding). In particular, with regard to their values => 1, when the HTMT is 1 or larger than 1 it implies that the correlations of items within the constructs are smaller than the correlations with other constructs. This is common in formative second order models, as formative measures measures may not be highly correlated with one and other as they are independent (not highly correlated) dimensions of the second order variable. Here Place Dependence, Place Identity and Social Bonding are the 'items' or measures of Second Order variable Place Attachment. As they are formative measures there is no requirement for these items to be highly correlated with one another.

7.11.2. Assessing the Formative Model – Second-Order Construct

After evaluating the reflective measurement model, the next step of this quantitative analysis includes assessing the formative model of the higher-order latent construct model. Following the procedure of Hair et al. (2017) three steps are executed as shown in figure 7.5:



Figure 7.5 Evaluation Steps of the Formative Model Source: Hair et al. (2017).

The first step involves a convergent analysis, followed by a collinearity analysis. The third step refers to test the significance of the formative measures.

7.11.2.1. Convergent Validity Analysis

A convergent analysis or redundancy analysis relates to a positive correlation of an indicator with the same construct by including different indicator variables. In this

sense, the formative measures are supposed to highly correlate with an indicator variable that is measured reflectively of the same construct (Hair et al., 2017). This is according to Cheah et al. (2018) an important requirement for the empirical measurement of the formative model. Further, a single-item variable is sufficient to capture the variance of the formative measures. For instance, Hair et al. (2017) referred to a minimum path coefficient of 0.7 which explains 50 % of the variance of the combined formative measures. Moreover, as Sarstedt et al. (2013) suggested, the single-item indicator should capture the key essence of the formative indicators. Following this approach, the following figure 7.6 shows the formative indicators and the reflective single-item indicator.



Figure 7.6 Convergent Analysis of Formative Measures

In this study, PA is measured formatively by three indicators namely, 'Place Identity', 'Place Dependence' and 'Social Bonding'. The global item 'I feel strong sense of belonging to the Lake District' captures a great amount of the formative measures Based on the analysis the path coefficient of the formative indicators is higher than 0.80 and therefore exceed the minimum value of 0.70. and convergent validity is observed.

7.11.2.2. Assessing Collinearity and Significance of Formative Indicators

Unlike reflective measurements, formative indicators are not assumed to be correlated. A high correlation also referred to as collinearity, may cause problems when interpreting results (Hair et al., 2017). For instance, collinearity may increase the standard errors of the path coefficients, limits the size of the coefficient of determination or weakens the interpretation power of predictor variables. Thus, formative indicators with collinearity issues may bias research findings (Field, 2013). The variance inflation factor (VIF) can be applied to test the collinearity of the latent constructs. Values of less than 5 VIF indicate no collinearity issues (Hair et al., 2017).

The next step includes evaluating the significance level and hence, the contribution of the formative measurement for the second-order latent construct. In this respect, the outer weights are important to be significant since they represent a linear combination of scores forming the formative construct (Hair et al., 2017). In this study, the formative indicators are 'Place Identity', 'Place Dependence' and 'Social Bonding' forming the construct of 'Place Attachment' and thus explain 100 % variance of the latent construct. The following table 7.10 shows the outer weights, t-values with corresponding p-values as well as the VIF score for each formative variable. For the formative analysis the repeated indicator approach is applied assigning all indicator variables from the first-order constructs to the second-order construct (Hair et al., 2017).

Table 7.10	Assessing	Formative	Measurement
	J		

Formative Measure	Constructs	Outer Weight	t Value (p- values)	VIF
Place Attachment	Place Identity	0.406	25.991 (p <.0001)	2.908
	Place Dependence	0.399	27.594 (p <.0001)	2.468
	Social Bonding	0.313	20.563 (p <.0001)	1.982

The analysis demonstrates that all three first-order constructs contribute significantly to the formative latent construct where 'Place Identity' (path coefficient = 0.406) has the biggest contribution followed by 'Place Dependence' (path coefficient = 0.399) and 'Social Bonding' (path coefficient = 0.313). Furthermore, the VIF scores for all three variables are less than 5 and consequently, no collinearity issues exist. In this sense, it can be argued that reliability and validity measures are established for the formative model.

7.11.3. Assessing the Structural Measurement Model

After the reliability and validity of the outer model (measurement model) has been established the next step refers to the evaluation of the inner model (structural model) and hence, demonstrating the level of significance of the hypothesised relationships between the constructs (Hair et al., 2017). For this purpose, PLS-SEM is applied using the PLS algorithm with the SmartPLS software version 3.2.8 (Ringle et al., 2015). To assess the model parameters bootstrapping is applied. According to Streukens and Leroi-Werelds (2016) bootstrapping is a non-parametric resampling procedure drawing on a variety of sample data. Hereby, a great number of re-samples are drawn and replaced from the original sample. Based on that procedure the model parameters are estimated for each re-sample of the bootstrap. Moreover, the standard error of the estimations is deduced from the standard error of the bootstrap estimate (Henseler et al, 2016).

7.11.3.1. Significance of Structural Model Loadings

To assess the inner model, the PLS-SEM algorithm calculates all relevant scores and path coefficients. Following the parameter suggestion of Hair et al. (2017), the PLS-SEM algorithm uses the path weighting scheme with 500 iterations which is more than the suggested minimum of 300. Further, the bootstrapping process which draws random subsamples from the original data set to estimate the model is suggested to be set at 5000 subsamples. In figure 7.7 demonstrates the final conceptual model to be tested.



Figure 7.7 Final Conceptual PA Model Source: Author

The final proposed framework shows the hypothesised relationships for the assessment of the PLS-SEM model. A direct effect on 'Increased Intention to Revisit and Place Attachment' is proposed to have a positive impact through 'Presence', 'Memories' and 'Increased Place Knowledge'. Further, 'Aesthetics' and 'Accessibility' is considered to have an indirect effect through 'Presence' and 'Memories'. Moreover, 'Place Attachment' serves as a moderator variable. Based on the bootstrapping process following table 7.11 reports the path coefficients, t-values and p-values for all hypotheses. Furthermore, based on the exploratory nature of this study, research question and aim no control variables were considered. However, gender was tested as a control variable showing no significant impact for this study.

	Hypothesis	Path Coefficient	t Value	p Value
Hypothesis 1	Aesthetics -> Presence	0.568	8.214	.000***
Hypothesis 2	Aesthetics -> Memories	0.231	2.243	.025*
Hypothesis 3	Accessibility -> Presence	0.304	3.848	.000***
Hypothesis 4	Accessibility -> Memories	0.375	4.138	.000***
Hypothesis 5	Presence -> Increased Intention to Revisit and Place Attachment	0.136	2.054	.040*
Hypothesis 6	Memories -> Increased Intention to Revisit and Place Attachment	0.195	3.024	.003**
Hypothesis 7	Increased Place Knowledge -> Increased Intention to Revisit and Place Attachment	0.536	9.374	.000***
Hypothesis 8a	Presence X Place Attachment	-0.154	2.155	.031*
Hypothesis 8b	Memories X Place Attachment	-0.004	0.066	.948
Hypothesis 8c	Increased Place Knowledge X Place Attachment	0.173	3.019	.003**
*p < 0.05; **p <	0.01; p*** < 0.001			

Table 7.11 Overview of Hypothesis

The table shows the standardised path coefficients for the hypothesised relationships. The p and t value report the significance level of each variable and thus, allows the hypotheses to be accepted or rejected. In addition, most of the hypotheses show a positive relationship between the variables. However, in two cases there is a negative relationship. The slightly negative relationship for hypothesis 8a can be explained as follows, that the low PA groups have a stronger effect on the relations that the high PA group. Overall, as Presence increases, there is Increased Intention to Revisit the destination. However, as the level of existing place attachment (the moderator) increases, it reduces the impact of Presence on Increased Intention to Revisit (hence the negative path coefficient), as shown in figure 7.8. For hypothesis 8b, the moderator (Memories) has no statistically significant impact and should be rejected.

7.11.3.2. Path Analysis

Path coefficients are used and are interpreted as path coefficients demonstrating the strength and the direction of a hypothesised relationship between variables (Henseler et al., 2009). In this study, the proposed model has three purely independent variables ('Aesthetics', 'Accessibility' and 'Increased Place Knowledge'). The variables 'Presence' and 'Memories' are functioning as both independent and dependent variables since they have two predictor variables but also serve as predictors. However, they are considered as endogenous variables together with 'Increased Intention to Revisit and Place Attachment' (Hair et al., 2017).

Based on the path analysis the proposed model reveals that 'Aesthetics' has the greatest effect (path coefficient = .568) on 'Presence' followed by 'Accessibility' (path coefficient = 0.231). Hence, an aesthetic VR experience of the destination leads to the higher subjective experience of being mentally transported to the virtual place in VR. Furthermore, it can also be concluded that an aesthetical VR experience triggers tourists' memory showing a positive impact on their attachment level.

The variable 'Accessibility' has its strongest (path coefficient = .375) impact on 'Memories' and also influences 'Presence' with a path coefficient of .304. Thus, providing tourists with the ability to access the places in VR enables to recall past event and experiences. A direct effect on the endogenous variable is specified by 'Presence', 'Memories' and 'Increased Place Knowledge'. The exogenous construct 'Presence' has a direct impact with a path coefficient of .136 followed by 'Memories' with a path coefficient of .195. However, the strongest impact on tourists increased intention to return to the destination is given by 'Increased Place Knowledge' with a path coefficient of .536. Hence, the unique perspective that is provided by the VR experience allows people to gain new knowledge about the destination leading to a higher bond. Also, previous memories about the place may reinforce the relationship to the destination. This includes also through presence where tourists are exposed to the place virtually. The latent constructs 'Accessibility' and 'Aesthetics' do not have a direct effect on the endogenous variable 'Increased Intention to Revisit and Place Attachment'. However, they possess an indirect effect mediated by 'Accessibility' and 'Aesthetics'. In this sense, the total effect can be calculated by adding the product of the path coefficients for each link among the constructs. Starting with 'Aesthetics', the sum of the products between the paths over 'Presence' and 'Memories' to 'Increased Intention to Revisit and Place Attachment' show a path coefficient of 122. For 'Accessibility' the results of the standardised coefficient are .114. Since, all path coefficients are statistically significant they all contribute to the dependent variable and thus, to an increased attachment to the destination.

7.11.3.3. Effect size

To assess the explained variance of the moderator variable on the dependent variable the effect size f^2 should be considered (Hair et al., 2017). According to Cohen (1988), values of 0.02, 0.15, 0.35 are considered as small, medium and large effect sizes.

However, Aguinis et al. (2005) conducted a literature review of articles over 30 years showing the mean effect size is 0.009. In this respect, Kenny (2018) proposed effect sizes of 0.005, 0.001 and 0.025 to be considered as small, medium and large. All effect sizes of the latent and moderation variables are presented in table 7.12. Based on Cohen the moderating effect is weak compared to Kenny which are considered to be large. Despite the different classifications, the small effect size can be relevant if variables are considered to have practical or theoretical importance (Aguinis et al., 2005).

	Table	7.12	Overview	of the	Effect	Size
--	-------	------	----------	--------	--------	------

Variable	Effect Size
Place Attachment	.096
Memories	.064
Moderating Effect PA on Presence	.046
Moderating Effect PA on Memories	.000
Moderating Effect PA on Increased Place Knowledge	.071
Presence	.034
Increased Place Knowledge	.657

Based on the VR literature the concept of presence is a key aspect of a VR experience (Tussyadiah et al., 2018). Similarly, place knowledge, memories and an existing bond to a place is vital within PA theory since knowing the place is essential to interact with and to build or maintain the relationship (Scannell and Gifford, 2003). Hence, all variables are considered to be relevant for this study.

7.11.3.4. Coefficients of Determination (R²)

After identifying the significance of the path coefficients, the next step includes determining to what extent the exogenous variables predict the endogenous variables, and hence, how much variance in endogenous variables the model explains. PLS-SEM does not possess a standard goodness-of-fit statistic indicating the quality of the model. Rather, the quality is determined by the coefficient of determination (R²) (Hair et al., 2014). This coefficient represents the combined effects of the independent latent variables on the dependent variable. In particular, the coefficient ranges from 0 to 1 demonstrating the level of explained variance of the dependent variable through the independent variables (Hair et al., 2017). According to Chin (1998), R² values of greater than 0.67 are considered substantial, greater than 0.33 as moderate and

greater than 0.19 as weak. Table 7.13 provides an overview of the coefficient of determination for this study.

Variable Name	Coefficient of determination (R ²)	Impact Level
Presence	0.64 (64 %)	Moderate
Memories	0.31 (31 %)	Weak
Increased Intention to Revisit	0.79 (79 %)	Substantial
and Place Attachment		

|--|

Based on the results of this study, 'Presence' shows a moderate explanatory power with 64 %, while 'Memories' is explained with 31 % and is considered weak. The explained variance of the dependent variable 'Increased Intention to Revisit and Place Attachment' has a coefficient score of 0.79 and is considered to exceed a substantial level. Hence, the proposed model of this study explains 79% of the variance of tourists increased intention to return to the destination. This is mostly explained by 'Increased Place Knowledge' followed by 'Presence' and 'Memories'. Thus, the greatest variance of tourists' Increased Intention to Revisit and Place Attachment is explained by their increased knowledge through VR, their feeling of presence and experience of the Lake District in VR and memories.

7.11.4. Moderating Effects

In addition to path analysis revealing the direct and indirect impact of constructs this model also includes a moderation analysis. In this sense, the current attachment level measured by the variables 'Place Attachment' serves as a moderator as shown in figure 7.7 corresponding to hypotheses 8a, 8b and 8c. The moderation takes place between each of 'Presence', 'Memories', 'Increased Place Knowledge' and 'Increased Intention to Revisit and Place Attachment' and thus, examines the impact of Place Attachment on the relationship between those three independent variables and the dependent variable Increased Intention to Revisit and Place Attachment to Revisit and Place Attachment (Hair et al., 2014). Therefore, it is hypothesised that the degree of tourists' existing PA might change the relationship between tourists' perceptions of presence, memories and increased place knowledge through the VR experience and their intention to express an Increased Intention to Revisit and Place Attachment. In this study, two moderating effects are significant (Hypothesis 8a and 8c) namely, the moderating effect of 'Place

Attachment' on 'Increased Place Knowledge' (\rightarrow) Increased Intention to Revisit and Place Attachment and 'Presence' (\rightarrow) Increased Intention to Revisit and Place Attachment. The moderating effect on 'Memories' (\rightarrow) Increased Intention to Revisit and Place Attachment (Hypothesis 8b) is not statistically significant and the hypothesis is rejected.

7.11.4.1. Moderating Effect between Place Attachment and Presence

The following figure 7.8 presents the slope analysis of the moderating effect between 'Presence' and 'Increased Intention to Revisit and Place Attachment'.



Figure 7.8 Moderating Effect of Place Attachment on Presence

The moderating effect of PA on tourists' level of presence is slightly negative with a standardised path coefficient of - 0.154 (p < 0.05). Figure 7.8 represents the relationship between the dependent variable (Increased Intention to Revisit and Place Attachment) on the y-axis and the x-axis shows the independent variable (Presence). The moderation effect is displayed by the three lines showing the relationship between the wariables. The red line indicates the average mean level of both relationships. The blue line shows tourists' lower level of PA and differs one standard deviation below the PA mean score, while the green line indicates the higher level of tourists' PA with one standard deviation above the PA mean score.

In this respect, a general higher level of presence leads to a higher Increased Intention to Revisit and Place Attachment. However, this is only true for the average and low PA groups. For both groups, the moderator effect shows a positive relationship. The strongest relationship is for the low PA group when it comes to the relationship between presence and Increased Intention to Revisit and Place Attachment. However, results differ when comparing the high and low levels of place attachment. In contrast to the average and low PA group, tourists with an existing high attachment level, as shown by the green line, no relationship exists. Therefore, for tourists with a higher PA level the increase of presence does not have an impact on their Increased Intention to Revisit and Place Attachment.

7.11.4.2. Moderating Effect between Place Attachment and Increased Place Knowledge

The second significant moderation of PA is given between 'Increased Place Knowledge' and 'Increased Intention to Revisit and Place Attachment'. The slope analysis is provided in Figure 7.9 showing the relationship of the moderator variable.



Figure 7.9 Moderating Effect of Place Attachment on Increased Place Knowledge

The moderating effect is positive on all levels of PA as the three lines indicate with a standardised path coefficient of 0.173 (p < 0.1). On average, as shown by the red line, the higher the increased place knowledge through the VR experiences the higher the increased intention to return to the destination. Following the blue line, VR has a positive effect on tourists' intention to return to the destination even if the current subjective bond to the place is low. However, more interestingly as shown by the green line, for tourists with a high level of PA the VR experience of Increased Knowledge has a stronger effect on Increased Intention to Revisit and Place Attachment as a stronger

relationship exists between the variables. This may be due to a coherence effect psychologically as examined in the chapter (8.5.3) below.

7.12. Common Method Bias – Kock Test

As mentioned in the methodology chapter (5.10.2) applying common method bias can be implemented before and after the study is carried out. In this sense, the former relates to measurements to avoid CMB beforehand, while the latter can apply calculations to test for any CMB existing in a study. For that purpose, this doctoral thesis follows the CMB test for PLS-SEM as suggested by Kock (2015). Based on the full collinearity test all VIF scores are supposed to be higher than 3.3 when using a latent marker variable (Kock, 2015). In particular, the VIF threshold for the factor-based PLS-SEM algorithm should not exceed 5 as suggested by Kock and Lynn (2012). Based on the latent constructs and the used marker variable in this study, the following table 7.14 shows the VIF scores indicating CMB should not be a concern in this study.

Variable	VIF Score
Place Identity	3.023
Accessibility	2.148
Social Bonding	2.240
Increased Place Knowledge	3.037
Increased Intention to Revisit and Place	3.325
Attachment	
Place Dependence	2.839
Presence	4.703
Memories	2.819
Aesthetics	3.614

Table 7.14	VIF Scores -	Factor-Based	PLS-SEM	Algorithm

7.13. Summary

This chapter presented the process and the results of the quantitative analysis of the conceptual model of this study. The process described how the quantitative research stage was executed in terms of instrument design, data collection and sampling. In regard to the analysis part the first step outlined the screening process of the data set. Additionally, the descriptive statistics provide a brief overview of the key characteristics of the sample. Furthermore, to meet the quality criteria for the PLS-SEM technique a variety of calculations are carried out. In particular, the validity and reliability for both measurement models are established. This includes necessary adjustments leading to the final development of the PA framework allowing to continue to test the hypothesised relationships. Overall, the PLS-SEM analysis shows that all hypotheses

except one moderation effect are statistically significant. Furthermore, the explanatory power of this model is substantial with almost 80 % explained variance of the dependent variable. The key results show that enhanced knowledge provided through VR possesses the strongest impact on tourists' increased intention to return followed by their memories and the level of presence in VR. The next chapter discusses the findings with the literature review and the purpose of this study.

Chapter 8 – Discussion of Main Findings

8.1. Introduction

This chapter will discuss the literature and primary and secondary research conducted during this PhD research. For this purpose, the key findings are discussed from the qualitative and quantitative stages. In particular, the constructs that emerged from the interviews are presented as also their relationship with the proposed model in this study. To critically discuss the findings and discussion points, similarities and differences were debated in combination with the literature on PA, VR and tourism. The structure of this chapter follows the identified key findings of the qualitative and quantitative stages such as place emotions and memories, experience place realism and VR aesthetics, the empirical concept of PA and Increased Intention to Revisit and Place Attachment and VR experience and Increased Intention to Revisit and Place Attachment. Hence, the key contributions of this study are:

• Development of new themes that were explored in the qualitative stage

The newly identified themes that emerged from the qualitative analysis were Accessibility, Atmosphere, Memories and Increased Place Knowledge. The themes Aesthetics and Presence that were developed from the literature were confirmed during the qualitative stage. All themes were identified as important for contributing to PA theory within VR and tourism context.

• Presenting a PA framework within VR and tourism

To present the newly developed PA framework the findings from the qualitative stage and literature review determined how the individual themes are interconnected to form PA. To capture the increased effect of VR on PA the constructs Increased Place Attachment and Increased Intention to Revisit were created and added to the model. PA was included as a moderator variable to assess the impact of tourists' current PA level. As presented in figure 6.2, based on the themes' relationships the hypotheses were formulated and tested in the quantitative stage.

• Testing the newly developed PA framework

To test the PA framework which was developed during the qualitative stage PLS analysis was applied. Final adjustments to the proposed model were made during the PLS procedure due to established construct validity. The themes Aesthetics and Atmosphere were merged into Aesthetics. The themes Increased Place Attachment

and Increased Intention to Revisit were merged into Increased Intention to Revisit and PA. Thus, the final PA framework (figure 7.7) included Accessibility, Aesthetics, Memories, Presence and Increased Place Knowledge as independent variables. In addition, it contained Increased Intention to Revisit and PA as the dependent variable and PA as a moderator variable. The PLS analysis tested the hypotheses of the final PA framework as presented in table 7.11.

Based on the key contributions, this chapter will discuss the qualitative and empirical findings. This also includes the meaning of the key highlights of the moderator effects. Overall, the final developed and tested PA framework contributes to PA theory demonstrating the impact of VR to enhance PA.

8.2. Place Emotions and Memories

Place emotions and memories were found to be strong concepts within the context of this study. A key finding from the qualitative and quantitative research reveals that the VR experience led tourists to experience a strong SoP emotions and memories of the Lake District. For instance, the qualitative findings of this study revealed that the VR experience triggered place emotions through a variety of benefits such as providing accessing the place and triggering place memories. One of the benefits and a key finding of this study is the concept of 'Accessibility', which can be considered an important contribution of this study. This is particularly true as it has not been fully researched and explored within PA, VR and tourism.

Although the concept of accessibility is not entirely new in the literature in general, this study demonstrated the importance of an accessible tourist destination; allowing tourists to view areas that are normally inaccessible through a different lens. Within previous literature, accessibility has often been referred to to address the various requirements of tourists encountered at the tourist destination (e.g. access to infrastructure and amenities) (Buhalis et al., 2012). Considering the ageing population, this development is becoming increasingly important since also the number of people with disabilities is growing ((WHO and WB, 2011). This was also supported by the qualitative findings as tourists appreciated the opportunity to experience the Lake District in a fully immersive VR environment where travelling within the destination was not possible. In addition, findings have shown how VR was perceived positively by

tourists who did not have the time, money or physical ability to explore various places. Hence, accessing and exploring the place on-site through the VR experience served as a substitutional experience. This was not solely important for tourists who had a disability, but as shown by the interviews it was also valued by able-bodied tourists predicting VR as an opportunity to visit the Lake District virtually in case travel was restricted due to various reasons. Considering the latest travel restrictions, this covid pandemic caused additional accessibility issues for tourists to travel. Therefore, VR were considered as a perfect tool to mitigate the negative effects of not being able to travel (Chen and Petrick, 2013).

However, as argued in this study, accessibility has a deeper meaning for tourists and therefore, is not just restricted to access to tourist amenities. In this sense, exploring VR from a PA theory perspective brought another theoretical and practical layer to the discussion when considering accessible tourism for tourist destinations (Natalia et al., 2019). As shown through the qualitative stage of this study, accessibility can be linked to a positive emotional experience. In particular, the interview findings have shown that an immersive VR experience of the Lake District let tourists to maintain their relationship with their favourite places. This ability was valued to reconnect to the landscape of the Lake District. This aspect seemed even more important as a constant loss of the place or detachment from the place may lead to a negative SoP. This may have physical and psychological consequences (Shamai, 2018) or loss of reality and in turn to people's identity (McKinzie, 2019). Therefore, the negative aspects are even more crucial to be considered as PA is always assumed to be positive. Therefore, these important findings add to a new dimension to accessible tourism when considering existing literature on how attachment is formed and maintained.

In this respect, interacting with the environment is vital and PA development is based on positive experiences and direct interaction with the place (Kudryavtsev et al., 2012). In addition, maintaining the link to a place is considered an essential experience of humans since life experiences are connected to the natural and built environment. In this sense, peoples' past experiences, values, thoughts, meanings, and memories are tied to places representing a part of their identity (Scannell and Gifford, 2010a).

Furthermore, places play a key role in shaping peoples' self that starts in childhood to adultness (Chawla, 1992, Morgan, 2010). This was also evident for the Lake District

as a tourist destination and are considered as an important place that has an impact on an individual's life representing a part of their identity. Considering this aspect, the interviews have shown that each tourist had a personal story to tell that was connected to the Lake District. Hence, accessing the place through VR did not solely help tourists to upkeep their relationship to the place, but it also allowed tourists to keep a part of their place identity alive. This, in turn, enabled a continuation of place interaction allowing them to remind who they are and where they are coming from. Hence, 'accessibility' from a PA theory perspective can be argued as a key requirement for any human-environment interaction and thus, access to the place is paramount. In particular, studies confirm the ability of VR to provide accessible tourism and are in line with the findings of this study (Zambrano et al., 2017; Maach et al., 2018, Edler et al., 2019), however, they represent technical VR solutions to access places. Consequently, presenting accessibility within a fully immersive VR experience has a practical on-site implication for tourists where theoretical implication had not fully been researched within PA theory. In addition, most VR studies, and particularly in tourism, focused on accessibility as a general statement, and therefore, theoretical development and practical implications for tourists or destinations were limited. Therefore, it is believed that this study opened and presented a new perspective on how VR technology can serve as a bridging link to maintain tourists' emotional bond (Low and Altman, 1992) with the Lake District.

Another important theme that adds to place emotions and has emerged from the qualitative stage are "memories". In particular, VR helped to trigger autobiographical memories (Zhang et. al, 2021) of tourists by allowing them to relive past experiences. Especially, within the concept of accessibility as previous explained, reconnecting to the Lake District allowed tourists to remember their past experiences. In addition to the qualitative findings, the quantitative analysis also supported the relationship between accessibility and memories as shown in Hypotheses (4). Hence, these two aspects seemed important themes that were newly presented and established as significant. Based on the qualitative stage of this study, the VR experience enabled tourists to have vivid memories about their past experiences and trips to the Lake District. Hereby, memories were recalled from childhood to adult life.

The interview findings revealed how tourists constructed their past reality by recreating their own stories that connected them to the Lake District. This ability to create a tourist's subjective and personalised experience was achieved by the fully immersive VR technology allowing them an enhanced view of the Lake District. In particular, tourists were able to look at the landscape in 360 degrees and to pick up familiar landscape elements that were important for their memories. This ability was highly valued by tourists and perceived as more advanced than solely looking at pictures where a certain scene is presented from a particular angle that can't be changed dynamically. Further, in line with the literature, previous studies supported the stronger impact of VR compared to 2D images (Griffin et al., 2017). In addition, a recent study in PA and tourism by Zhang et al. (2021) found a positive impact of travel photographs on autobiographical memories. Hence, visualisation of trips helped tourists to maintain their relationship to the place. Therefore, VR technology helped tourists mainly to visually interact with the Lake District by giving tourists the freedom to identify landscape marks that were important parts of their past. Furthermore, it can be argued that the impactful visualisation of the landscape in VR also established a virtual touchpoint between tourists and the Lake District. This allowed simulating a direct interaction from an ego perspective and an intensified feeling of being self-interacting. Thus, with the benefits of VR to support tourists' memories the virtual experience enabled them to recreate the past on-site. This powerful combination of representing a vivid VR experience of the Lake District led tourists to an emotional involvement that impacted their current visit in form of a personalised or shared experience. Hence, it is not solely the place that was important, also, the social aspect was considered as crucial.

Moreover, the qualitative staged revealed that memories played a key part when returning to the Lake District since tourists were remembering their previous trips and repeat visitation which fostered a sense of continuity. This was manifested in manifold ways as tourists were visiting the Lake District as a child and with grandchildren or children nowadays. Also, remembering important life events with partners and friends added to the positive feeling of being at the destination. Thus, loyal behaviour towards the Lake District was intergenerational and based on memorable past events that built part of the tourist experience at the destination that was enhanced by VR.

Consequently, as the interviews further demonstrated, the VR experience was not focusing on creating memorable tourist experiences, rather VR revealed its strength in evoking autobiographical memories. This was an important and new perspective to

consider since studies of immersive technology-related applications aim to provide a novel experience and to enhance the overall tourist experience. However, triggering memories in VR served as a connection between past and presence evoking feelings that were lived and tied in the Lake District and either enjoyed personally or shared with loved ones.

These positive findings elicited by VR are in line with PA literature showing that memories are identified as the most beneficial outcome for people when interacting with attached places (Scannell and Gifford, 2017). In this sense, memories connecting to the past adds to the personal identity and people are actively looking to maintain their self-view (Wilson and Ross, 2003), and thus, reflects who they were and where they are now in terms of their personal development and physically (Manzo, 2005). This was also evident in this study but viewed from a fully immersive VR environment showing how VR reminded tourists how important the Lake District was for themselves by supporting them to reconstruct a part of their life. Despite tourists' lack of VR experiences, VR was highly valued, and tourists expressed positive feelings and emotions. Thus, VR showed to have a practical meaning for tourists' on-site experience to connect them to their past. Previous studies mainly focused on creating memorable experiences with a general lack of research on exploring the relationship between memories in VR from a PA perspective. Therefore, this study contributed to the gap by exploring the application of VR from a new perspective by showing its function to trigger memories.

Combining the benefits of accessibility and the effect of VR to reinforce memories tourists enjoyed the VR experience and were happy to see the Lake District that they were used to travel to in the past or were unable to go on their current holiday. This positive experience was reinforced also through memories as VR linked to the past to restore or to upkeep a part of a tourist's identity. Therefore, qualitative and quantitative findings support each other and were considered as a critical aspect in explaining the impact of VR within PA theory for tourists. However, since PA studies in VR are limited, this study presented these newly developed constructs from a PA perspective that have not been considered so far.

8.3. Experience Place Realism and VR aesthetics

Another important topic that has emerged from the results of this study related to the experience of realism (tom Dieck et al., 2018) and aesthetic features of the Lake District in VR. This was mainly driven through VR technology that enabled a fully immersive experience of the destination. This means tourists were able to achieve the highest possible immersion of the digital representation of the Lake District without noticing the physical place. The degree of realism could be traced back to the fact that the VR application provided real footage of the Lake District. In this sense, they were watching the same places that were experienced before in the physical setting, however in a different view. The experience of realism, as revealed through the qualitative research stage, during the VR experience provided tourists with a sense of realism of the destination that was perceived similar to the Lake District. In addition, the realistic representation of the destination had a positive effect on tourists' subjective level of presence. In this respect, VR enabled a sense of mediated experience confirming the concept of presence as part of the VR experience. These findings from the qualitative stage are coherent with other VR studies in tourism that have provided a fully immersive VR environment for tourists (Tussyadiah et al., 2016; tom Dieck et al., 2018). Thus, VR created an authentic tourist experience that captured tourists' attention to interact with the Lake district digitally. Moreover, this captivating experience and perceiving the destination as real also led tourists to have the same feelings of being present at the places they saw in VR.

Hence, the VR experience was able to replicate emotions and feelings that are comparable to emotions in the real environment. Furthermore, this involvement of perceiving oneself as being part of the environment rather than participating from the outside had brought tourists to feel closer to the Lake District. This relationship in combination with accessibility as hypothesised in this study provides a powerful experience that either served as a substitutional or as a complementary experience for tourists at the destination. While the former (substitutional) was more valued for tourists with immobility issues, the latter aspect (complementary) seemed to have an impact on tourists that were actively exploring the Lake District. In particular, as identified from the interviews, VR has led to a change in tourist behaviour as tourists expressed their intentions to visit the places, they have seen during their VR experience. These interesting findings can be considered as important from a PA perspective since they could increase place interaction and consequently, foster the attachment level.

Furthermore, this confirmed how VR enabled new opportunities to increase the on-site tourist experience at the destination level. Consequently, VR is adding new perspectives that were unutilised before and findings showed how VR experience can be blended into an existing tourist consumption pattern.

Besides being able to visit the Lake District in VR leading to a positive reaction and to an emotional experience, the aesthetic experience served as a reinforcement to intensify this positive outcome. The qualitative stage revealed how tourists were mentioning various landscape elements and were perceiving them as aesthetically pleasant during their VR experience. In particular, the qualitative stage revealed that the VR content was able to capture the beauties of the Lake District that were important for tourists. This was also confirmed through the quantitative stage as shown by Hypothesis 3 demonstrating that aesthetics had a positive and significant impact on presence. Hence, evaluating the destination as attractive was considered as an additional aspect to increase the level of presence and was coherent with other studies confirming the importance of visual cues (Tussyadiah et al., 2016; Jung et al., 2017b). Although in some cases, VR was perceived superior in other cases tourists preferred the real environment. Nevertheless, the majority of tourists agreed that VR was able to represent the aesthetic features of the Lake District.

Besides the aesthetic values, the qualitative stage also revealed that the VR content transported a positive atmosphere of the place. This included the sound, colours and in general the whole presentation of the landscapes of the Lake District in VR. Unlike the qualitative findings where atmosphere and aesthetics were identified as two themes, the quantitative stage suggested both constructs to be combined into a single one. Therefore, it can be concluded that tourists perceived both aspects as similar and thus, the atmosphere was an essential part that contributed to tourists' aesthetics experiences in VR. Furthermore, the ability of VR to reflect the aesthetics of the Lake District digitally became even more important as it was evident that the Lake District has a great variety of landscape elements and unique aesthetic value for tourists (Jepson and Sharpley, 2015). This was also in line with the qualitative findings of this research as tourists pointed out how important and unique the Lake District was compared to other tourist destinations in the UK.

In this sense, a further aspect that was evident from the interviews was its symbolic power (Milligan, 1998) that was elicited through VR. In particular, the VR experience allowed a holistic perception of the Lake District leading to an appreciation of the destination. It was to some extent evident that tourists developed a sense of realising the symbolic meaning that the place holds for them. In this sense, the VR experience provided a unique perspective of the place by combining the aesthetic value and transporting the atmospheric features of a rural destination. In this respect, tourists realised how meaningful the Lake District was by capturing its holistic view and creating a sense of belonging. This is especially true as travelling to rural destination. In this case, the tourists realised the importance of the Lake District as a place to recover from their busy life or to find peace and harmony. Hence, the VR application provided the rural experience that is driven by the idyllic view of the Lake District reflecting a symbiosis of the natural environment and all landscape elements that were vital for tourists.

Discussing these findings from a PA perspective the environment and especially the aesthetic value as the main benefit from people's attachment-related to positive emotions and connecting to nature as tourists enjoy observing the beauty of their place (Scannell and Gifford, 2017). Hence, interview findings were mainly in line with the literature confirming visual cues are highly valued by tourists to foster their attachment level. However, the findings were also interesting to be viewed from the tourism perspective considering the importance of the idyllic view of a rural destination. In this line, the visual consumption of the landscape of rural places is referred to as the 'tourist gaze' by Larsen and Urry (2011). This concept was also observed in this study as shown by the interviews.

For example, tourists were pointing out specific aspects of the application such as "how colourful the trees were looking in VR", "how close the lake was to a certain place" or "how beautiful the place was looking on a sunny weather day". Thus, this study found that VR has brought another layer of visual digital consumption that showed to possess the highest degree of displaying realism compared to other technological devices. In addition, the visual aspect in this study was even more in main focus since the key experience was based on showing video material of the Lake District. Hence, the exclusion of the physical environment during the VR experience permitted a virtual

gazing on the Lake District without losing its natural attitude. Further, the aesthetic experience of the Lake District in VR contributed to the level of presence as confirmed in the quantitative analysis. One explanation might be through the users' involvement to gaze upon the aesthetic and atmospheric landscape. According to Wirth et al. (2007), carrying out possible actions in a VR environment may lead to a higher presence. This is indicated by Thornson et al. (2009) when they refer to a passive cognitive involvement where people are completely engaged in their action. These findings were linked also to this study, where the passive involvement of the 360-degree gazing experience in VR captivated tourists' attention by the aesthetic and atmospheric characteristics of the Lake District. To support this argument, a more recent study by Tussydiah et al. (2018) confirmed that possible actions of users within a fully immersive VR experience of a natural environment affected the level of presences positively.

Consequently, VR showed to fit into the existing tourist rural experience without causing any substantial amount of discrepancy between the digital and real representation of the Lake District. The preservation of the destination's key quality aesthetic experience of the Lake District in VR has been considered crucial since the VR experience had a complementary and substitutional function. Furthermore, place appreciation of the Lake District was argued to enhance the overall meaning and value of the destination during VR. Hence, considering the degree of realism and the aesthetic experience that can be simulated in VR tourists realised the emotional and symbolic value that the landscapes of the Lake District hold. This has led to a place appreciation as they had a fully holistic picture of the destination. Therefore, as newly presented and argued in this study, the fully immersive VR experience enabled this powerful and important aspect that has theoretical and practical value for PA within tourism. The research on the relationship between 'Aesthetics' on 'Presence' within a fully immersive VR and tourism are scarce and therefore the hypothesized relationship was newly presented in this study context.

8.4. Empirical Concept of Place attachment and Increased Intention to Revisit and Place Attachment

This study used a unique and novel approach to measure the concept of place attachment. The concept of PA as used in this study did not follow a standard

procedure as applied in most studies. In this sense, two different approaches were used to provide new and insightful results to allow a more detailed answer to the research question. Firstly, this study measured PA as a reflective-formative model represented as a second-order model and, secondly, PA was used as a moderator variable exploring the relationship between the independent and dependent variables. In the context of the first argument, previous literature reflects a range of different empirical models of how to measure PA, some of them more valid and reliable than others. This is due to the lack of studies that replicated these empirical models to establish validity and reliability values. Further, in recent years more enhanced models such as SEM studies were found in the empirical analysis of PA showing causal relationships among variables. Also, in this study, the decision was made to use a more complex approach to reveal the cause and effect of relationships within a PLS-SEM approach. In contrast, previous PA studies in tourism showed the use of different statistical methods but when applying SEM models the main approach was a reflectivereflective second-order model. This study followed the same approach except applying a reflective-formative model to measure PA that was considered as more appropriate. In this sense, the key question about using PA that way evolved around the concept of PA seen either as reflected through a variety of variables or as being formed by a composition of variables. The decision to apply a reflective-formative model was based on two factors. Firstly, the theoretical consideration as presented in chapter (2.7) provided enough evidence from the literature to justify this decision. In addition, also the quantitative analysis as the PLS-SEM calculations showed confirmed its validity empirically. Thus, presenting PA from these both perspectives is believed to add to the discussion of how PA can be applied underpinned within a theoretically and empirically foundation. This is considered as a new contribution as reflective-formative models of PA is rare among studies and only a few authors followed that approach (Stylos and Bellou, 2019). Although other studies seldom justified the alternatives methods to measure the construct of PA, it is believed that it was mainly driven by the statistical choice that did not allow to apply a reflective-formative approach.

Thus, by using PLS-SEM, this study was able to demonstrate how PA was formed through three variables, namely, place identity, place dependence and social bonding (van Riper et al., 2019). In this sense, the interviews and questionnaire demonstrated that being attached to the Lake District had a variety of reasons that are important for

tourists. For example, being part of the Lake District, having fond memories of being emotionally invested are both related to tourist's identity, whereas place dependence referred to appreciate the activities that can be undertaken within a variety of different landscapes. Furthermore, sharing and participating with family members or friends were also reflected in tourists' stories that were important and related to the Lake District as part of their bond to the destination. Thus, it is believed that forming a bond to a destination is an interplay of all these aspects and removing one variable would alter the meaning of PA as it is currently defined. Consequently, measuring PA as a reflective-formative model seemed to be a valid option and contributes to the amount of alternatives measurements to the existing literature on PA in tourism.

The second aspect referred to the application of PA as a moderator variable. Similar to the first aspect, the number of previous studies with PA as a moderator variable is scarce, although it was suggested in the past that applying PA as a moderator variable would be meaningful for providing more nuance insights (Gross and Brown, 2008). Therefore, following the research aim in this study, the decision to apply PA as a moderator enabled to produce a more sophisticated result to give a more detailed answer. In particular, the moderation effect was highly valuable since it allowed to incorporate the degree of tourists' attachment to the Lake District. In this sense, it was examined to what extend the VR experience was impacted by tourists' subjective PA between the independent and dependent variables. Hence, it was possible to identify important themes emerging from the qualitative stage that was more in favour of less attached people and other themes that were more important for more attached tourists. Consequently, the quantitative approach enabled this study to get a deeper understanding to what degree existing PA influences the VR experience on-site, and hence, at the Lake District. This aspect of VR is beneficial to explore within PA theory since the subject area is widely unknown. It also revealed practical implications for tourist destinations to understand how VR technology can be utilised. Furthermore, combining both methods, the mixed method design demonstrated its benefit to gain a better understanding of how VR experience within PA can unfold its strengths. Consequently, without the moderator variable important findings would never be revealed. Therefore, this study pointed out the major benefits of mixing methods that had theoretical and practical value.

In addition, the dependent variable 'Increased Intention to Revisit and Place Attachment' was newly introduced during the quantitative stage created from two constructs, namely, 'Increased Place Attachment' and 'Increased Intention to Revisit'. The former was modified from PA constructs (Ramkissoon et al. 2013) and the latter construct altered from Increased Intention to Revisit items (Kim 2018; Stylos et al. 2017). The main idea behind creating the new variable 'Increase Place Attachment' aimed to measure if VR experiences enhanced the current tourist experience and consequently, the attachment level. In this respect, the variable contained items forming PA variables and were reworded to include an increased meaning in each item. Similarly, the same approach was applied for the second variable, namely the dependent variable and aimed to measure the increased interest to show behavioural intention to return to the Lake District. However, rather than providing behavioural evidence, for instance measuring the number of travels to the destination, this construct captured tourist's increased intention to return. This was considered as a good indicator since the sample included repeated tourists (Morais and Lin, 2010) to the Lake District and consequently, PA was existing to some extend including loyal behaviour. Hence, while other studies explored tourist's loyalty among first-time visitors (Stylos et al., 2017) another approach was necessary to measure a change in PA and behaviour within tourists' existing attachment and behaviour level. And, based on the initial idea that PA might influence future intention this informed decision introduced the assumptions that with an increase in PA there is also an increased desire to return to the Lake District. Therefore, both constructs were presented to measure an increase in tourists' attitude towards the Lake District, and hence helping to answer the research question.

However, similar, to the 'aesthetic' aspect, no discrimination could be achieved and based on theoretical considerations, uniting both variables seemed justifiable as presented in chapter (7.4.1.3). In this respect, based on the quantitative analysis process the variable "Increased Intention to Revisit and Place Attachment" was created and 'Increased PA' and 'Increased Intention to Revisit' were merged. Linking this construct to PA theory may be valid since showing loyal behaviour is part of the PA theory (Scannell and Gifford, 2010a) and thus, a higher attachment also includes a higher commitment to return to the destination. To some extent, the findings of this study may confirm that relationship or at least an argument could be made that both

are very closely related. Hence, considering these aspects, this study presented 'Increased Intention to Revisit and Place Attachment' as an attitudinal construct (PA) involving a psychological commitment (Kyle et al., 2007) to support the decisionmaking process in future (Swanson, 2015). This circumstance became evident in the empirical analysis of this study as both constructs were perceived as similar. Hence, for tourists that indicated an increase in PA, they also indicated a higher intention to return to the Lake District. Thus, this study proposed this new latent variable as part of an empirical discussion that was not considered so far.

8.5. VR Experience and Increased Intention to Revisit and Place Attachment – Presence, Memories, Increased Knowledge

This study explored the VR experience regarding an Increased Intention to Revisit and Place Attachment, applying a mixed-method approach. While the qualitative aspect enabled the identification of new themes the quantitative analysis established their relevance by showing their causal relationships. In this respect, three main concepts were identified as key drivers to increase loyal behaviour. The first concept related to the mediated experience, the second was related to the memories and the third concept involved increased place knowledge. Therefore, the relevance of the themes as a whole towards an Increased Intention to Revisit and Place Attachment can be summarised in three stages.

8.5.1. Presence on Increased Intention to Revisit and Place Attachment

The first stage stating that VR had a positive increase in tourists experience at the Lake District, was mainly driven through presence. As previously explained, the degree of realism in combination with the aesthetic value and atmosphere that were able to be reproduced similar emotions led to positive effects comparable to the physical environment. In this sense, it can be concluded that VR enabled a digital consumption of the destination and had a positive and significant impact on tourists Increased Intention to Revisit and Place Attachment to the Lake District. In this respect, this study showed that VR is a powerful medium that had a great impact on tourists at the destination level. Furthermore, findings filled the gap in the literature showing how fully immersive experiences are impacting people-place relationships. This is in line with similar studies in non-immersive environments in social media (Tieskens et al.,2018) where similar effects can be observed. However, it is believed that VR technology provides an innovative way of representing a place that is a new mediated experience

and can be compared to our existing experiences (Engberg and Bolter, 2020). Hence, as showed in this study, consuming the Lake District in VR was not solely restricted to watching a video on a social media platform or looking at pictures. Rather, it showed that this new way of consuming reached a maximum level of recreating a simulated experience that impacts feelings, emotions, aesthetic perceptions on a whole new level. Despite focusing mainly on the visual sense, the exclusive benefits of VR are related to giving the feeling of being part of the experience through the sense of being there rather than operating from outside, and thus, no contamination from the outside world. Although this concept is not new, it showed how the 360-degree presentation of the Lake District impacted tourists' bond to the destination from a whole new perspective, namely, to become one symbiosis with the virtual and to remind them how important and meaningful the Lake District was. While being part of the Lake District, the moderation effect of the VR experience produced a more detailed picture of this digital consumption of the destination. In this respect, the quantitative findings showed that tourists with a lower level of attachment to the Lake District were stronger impacted by VR compared to higher attached tourists. In addition, it was also found statistically significant as shown in Hypotheses 8a meaning that there was a statistical difference between high and low attached tourists with Increased Intention to Revisit and Place Attachment. In this sense, it can be concluded that consuming the Lake District in VR was perceived differently among tourists guided by their current bond to the destination. This indicated that tourist's stronger reaction to the VR experience could be linked to the amount of experience they previously had with the Lake District.

Thus, the amount of previous experience played a key role when tourist evaluated their relationship to the destination during their VR experience. In particular, a few tourists appreciated the VR experience but also stated during the interviews that VR did not change their perception of the destination since their attachment to the Lake District previously existed on a high level. Thus, providing a realistic sense of the Lake District in VR for highly attached tourists and allowing them to feel the destination through the mediated experience did not lead to an attitude change and consequently, to a higher Increased Intention to Revisit and Place Attachment purpose. On the other hand, the quantitative findings confirmed that a lower level of attachment to the place has led to an increase in attitude change towards the Lake District. Hence, while the majority of tourists' perceptions during the interviews are in line with the quantitative findings, the

remaining portion of tourists' indifference after their VR experience could be explained by their previous experience, they had with the Lake District. Thus, by exploring the moderator effect, both views were accounted for and tracked back to the fact that the degree of experience might be crucial. Comparing these findings with the literature, similar studies using PA as a moderator variable found comparable effects that could partially explain the findings of this study. In this sense, Stylos et al. (2017), found within an international tourism context that tourists' holistic image was regulated by their PA level when expressing their revisit intention. In particular, tourists with high PA were less affected by the destination's image compared to tourists with low attachment levels and. Also, King et al. (2015) indicated that tourists with low PA may need reinforcement of their experience to change the perception of the tourist destination leading to a higher behaviour intention. Further, the authors showed that weak PA led to an image decay over time compared to tourists with high PA. This could be explained because strong attitudes are persistent and difficult to change that may lead to a change in behaviour (Krosnick et al. 1993). In this line, it can be assumed that tourists that had not much previous experience or did not visit the Lake District frequently perceived the VR experience as more stimulating that reinforced their perspective and perception about the place compared to experienced tourists.

Moreover, another supporting argument might be explained by the mere-repeatedexposure effect involving exposing individuals to stimulation leading to a preference change for an object (Zajonc, 2001). In the marketing literature, this effect is used to explain the attitude change towards brands (Miceli et al., 2010). Hence, repeating an experience can lead to a positive increase in affection and attractiveness towards the object (Zajonc, 2001). For PA the mere-repeated-exposure effect may form place identity representing the affective attachment to a place (Backlund and Williams, 2004). However, this effect within VR and PA literature is rare but findings of this study indicate that VR could serve as a powerful medium to provide the stimuli and experience to increase the attachment to the destination. In this sense, the moderating effect of PA showed how VR changed the attitude towards the Lake District among tourists. Therefore, as newly suggested in this study, tourists with low PA seem to show stronger intention to return by exposing them to the Lake District in VR and allowing them to consume the experience compared to tourists with high PA. For high PA tourists, this effect may be less relevant since they know the place very well and are not triggered by solely repeatedly watching the Lake District in VR.

8.5.2. Memories on Increased Intention to Revisit and Place Attachment

The second stage related to the trigger of memories during VR that led to Increased Intention to Revisit and Place Attachment to the Lake District. This relationship was also found statistically significant during the quantitative analysis. In this sense, the main findings of this study showed how the VR experience evoked memories and tourists were reliving past holiday experiences that had an impact on their attitude towards the destination. While studies in tourism and PA focus on creating memorable memories that have a positive impact on the tourist experience for tourist destinations (Kim, 2018; Tsai, 2016), this study presented the effect of VR from a different angle. In this respect, VR showed its power as a visual medium to help tourists to remember more actively their past. Considering the importance of memories that are linked to places, VR showed to reactivate tourist's autobiographical memories and then in turn impacted the bond to a destination (Scannell and Gifford, 2010a). This is an important aspect of PA theory that was neglected in the literature. Therefore, VR demonstrated what role a fully immersive experience of the Lake District had on tourists' existing relationship to the place.

Furthermore, the moderating effect of PA allowed to produce a more nuanced insight into how the level of PA guided the relationship between memories on Increased Intention to Revisit and Place Attachment. However, this relationship was not found statistically significant, although it was very close to being considered as significant. Based on the results, the moderation effect showed that the level of tourists' PA did not play a key role when tourists recalled their memories in VR. The examination of this relationship between memories and Increased Intention to Revisit and Place Attachment as presented in this study is under-researched within the PA and VR literature. However, considering previous literature as Loureiro (2014), it was suggested to investigate the accumulated effect of previous place experience between memories and PA to reveal any reinforcement effects on PA. In this respect, this study revealed information to address this gap as the previous experience was reflected by the level of tourists' existing PA. Furthermore, also immersive technologies studies are scarce and therefore, investigating the moderation effect of memories within the VR

context also contributed to the current literature. As results showed, the level of attachment did not affect the relationship between memories on Increased Intention to Revisit and Place Attachment in VR. Therefore, the number of previous experiences with the Lake District showed no impact in enhancing the Increased Intention to Revisit and Place Attachment. One possible explanation can be linked to the circumstance, as argued by Chen et al. (2014), that PA can also be expressed in future intention to revisit the place due to a highly memorable tourist experience that had an impact on an individual's life. This experience might not be reflected through place dependence, place identity and social bonding (Chen et al., 2014) and thus, was not captured by the current level of PA. Similar results, as found by Vada et al. (2019), first-time visitors may develop an attachment to the destination depending on how significant the experience was perceived. Therefore, the low-PA group may possess similar strong memories as high-PA based on how meaningful the memories are. These findings were supported by qualitative findings as tourists' stories were quite different in terms of space and time. In this sense, stories were partially related as a sequence of different live events such as being at the destination as a child through an adult and hence, included many visits. On the other hand, in some instance's tourists remembered a memorable event that happened at the destination at any timeline. Hence, both examples were considered as very important memorable events although the former involved more previous experience with the Lake District. The importance of memories with the VR experience laid in providing a sense of continuity for tourists by triggering memories that were related to the physical landscape reflecting a part of their identity. In this respect, the visual experience in VR of the Lake District acted as a bridge comparing and symbolising tourists' past, presence, and future self. The analysis of the moderation effect of PA on memories and Increased Intention to Revisit and Place Attachment was positive for both groups of attachment levels. In this sense, VR led to an increasing effect independently of tourists' previous engagement with the Lake District.

8.5.3. Increased Place Knowledge on Increased Intention to Revisit and Place Attachment

The third stage involved the newly developed construct of 'Increased Place Knowledge' that was developed through the qualitative stage and also found

statistically significant in the quantitative analysis. As presented in Hypothesis 7, 'Increased Place Knowledge' showed the biggest impact in VR on 'Increased Intention to Revisit and Place Attachment'. In this sense, the VR experience of the Lake District provided new knowledge about the tourist destination. Based on tourists' responses, this was mainly achieved due to the ability of the VR application to provide an enhanced view of the destination. Especially, during the interviews, tourists appreciated the unique view of the Lake District showing the place from a bird's-eye perspective. This new experience of the destination allowed tourists to observe the landscape in a new way that was not able to be achieved without any technological help. Furthermore, the interviews showed that VR enabled tourists to discover new landmarks or places that were not visible or noticed before. In this sense, as tourists further pointed out, VR helped them to discover known places from a new perspective and to expand their knowledge about the landscapes. This new experience and interacting with the Lake District were very positively perceived and appreciated by tourists. On the other hand, it provided tourists also new knowledge about unknown places within the Lake district that they have never visited before. Hence, VR was able to extend existing knowledge but also to transfer new information about the Lake District. Comparing these findings with the literature, the aspect of place knowledge relates to the cognitive part of PA theory, particularly, what meaning is attached to the physical characteristics of a place (Scannell and Gifford, 2010a). In addition, place knowledge is also reflected through mental mapping such as having a mental representation of the place and holding information about the physical characteristics of a place and history (Scannell and Gifford, 2014; Smith and Aranha, 2020).

In this sense, the findings revealed that VR was able to extend the mental representation of the Lake District. For example, during the interviews, a great part of the tourists had little to no information about Tharn Hows which is a part of the Lake District. Moreover, landscape elements that were not visible or not explored achieved great attention from tourists. Considering the ability to increase spatial knowledge about a place, may affect an individual's assessment and attitude towards the place and hence, leading to a higher emotional attachment (Chen et al., 2014; McCunn and Gifford, 2018). Furthermore, for a tourist destination, cognitive mapping guides the tourist behaviour at the destination level (Lee et al., 2018). This was also evident in this study, as qualitative findings revealed that tourists expressed their intention to

change travel plans and planning to visit new places that were unknown before the VR experience. Hence, by increasing the information about the Lake District, there was also a higher intention to engage with the destination but also to evaluate the destination as a whole. These are important aspects for PA as engagement and adding new meaning resulting in an increased attachment level. Despite the lack of literature in VR to support these findings, previous studies exploring the impact of technology on places were examined to support the results of this study. For instance, Tussyadiah and Zach (2012) explored the impact of ICT with PA revealing that using geo-based technology provides the ability to gain new spatial knowledge leading to a meaningful and authentic experience of a place. This, in turn, shows to impact interactions and exploration of places resulting in forming PA. These findings were coherent with findings of this study where tourists perceived the VR experience as a novel experience by giving them a unique perspective of the Lake District. Especially, the possibility to fly over the place was perceived as a unique experience to discover places. Similar applications as demonstrated by Marchiori et al. (2018) confirmed the popularity of the bird's-eye view in VR. Furthermore, similar to VR technology, AR studies emerged considering PA theory examining the relationship between AR and places. For example, according to Chang et al. (2015), AR can help to increase new knowledge for visitors while being on-site and that newly gained knowledge in AR enhances the attachment level of visitors on the heritage site. Further studies, such as Oleksy and Wunk (2017), found AR gamification applications serving as a useful tool for visitors to interact with the real world. Hereby, visitors explore new areas and gain new information about places. However, in their study, AR enhanced PA through game satisfaction and social contacts were made while playing. In this sense, AR studies reveal the opportunities to engage with the destination and simultaneously to add new information. In line with previous literature, this study demonstrated that VR technology enabled an innovative way of transferring new knowledge and encouraged tourists to explore new areas in future.

To get a better understanding of how PA guided the relationship between increased place knowledge and Increased Intention to Revisit and Place Attachment, the moderating effects of PA were examined. This relationship was statistically significant and therefore, increasing place knowledge enhanced the attachment to the place were different for low- and high PA groups. Although both relationships were positive, adding

new information about the Lake District had a stronger impact on the high-level group. Furthermore, the effect was even increasing compared to the low PA group as higher the attachment level was considered to the Lake District. Thus, VR is demonstrated to have a stronger reinforcement impact towards an increased loyal behaviour for tourists with high attachment levels. A possible explanation for that effect can be delivered by integrating theories from psychology. For example, Maintaining Mental Model proposes how people restore a sense of familiarity and hence aim to establish coherence with their environment (Heine et al., 2006; Proulx and Inzlicht, 2012). In this sense, as Heine et al. (2006) argued, mental representation of existing structures is important since it represents the self to the external world. Further, a change in these structures cause an inconsistency of self and consequentially, people try to restore the balance and coherence in their lives. It is the longing to re-establish expected relationships between individuals and places that are connected through meaning (Heine et al., 2006). In this sense, different research contexts show how new information can cause discrepancy forcing people in mental shifting to restore coherence (Simon, 2004). These inconsistencies are aimed to be constructed within a single mental model (Albrecht and O'Brien, 1993). Since PA theory describes people's attachment to meaningful places, results may explain that individuals are trying to restore their feelings and to make sense of new facts or experiences since something new was added and changed the current perception of the destination. Also, considering different schools of thought in perception such as gestalt theory, one of the key principles refers to the perception as a whole and to perceive places as complete entities (Schroeder, 2007). Therefore, the tendency to feel and experience the Lake District in a coherent way could explain the positive impact of the VR experience intensifying the attachment for the destination. As explained previously, Tharn Hows was not known to many tourists. Assuming a highly knowledgeable tourist of the Lake District realised this missing piece, causing a mental distortion of his/her mental representation of the destination. This may lead to a stronger reaction and consequently, to engage and to restore the balance by filling out the missing pieces. Moreover, another explanation can be found within the incongruity theory (Mandler 1982) as several consumer behaviour studies demonstrate how consumers react to

new stimulations. In this sense, incongruity describes the discrepancy of a stimulus within an existing schema. For instance, experiencing incongruity may lead to a higher engagement and may increase the arousal level leading to a positive attitude change.
These attitudes are formed by resolving the incongruity such as through assimilation or accommodation based on previous knowledge that may create positive feelings (Lee and Schumann, 2004). Further, the overall interpretation of individuals positive feelings and attitudes depends on how new experience is processed within the existing schemata (Jurca and Madlberger, 2015). From this perspective findings of the moderation effect of increased knowledge could be explained by the aforementioned studies suggesting that new information about the Lake District led to a change in the level of congruity. Thus, the felt incongruity during the VR experience started a process to restore balance for both groups, namely low PA and high PA. However, this does not fully explain why increasing knowledge had a stronger impact on tourists with high PA compared to low PA. In this sense, as found by Dahlén et al. (2008), consumers showed a stronger brand attitude on familiar brands and thus, was based on existing brand knowledge. Further, as Lee and Schuman (2004) argued, people with extensive knowledge and well-developed schema are sensitive to the slightest changes and will invest in cognitive and affective processing to restore their congruency. Moreover, according to Fullilove (1996) being familiar and knowing the environment of a place is part of an individuals attachment to the place. In this sense, as Scannell and Gifford (2010a) argued, place schema includes knowledge and believes reflecting individuals' bond to the place resulting to become a part of one's identity. Thus, a higher place familiarity displayed in their current knowledge indicates how meaningful and important a place is. Therefore, a reason why tourists with high PA demonstrated a stronger reaction in VR could be explained by the increased meaningful personal importance for the Lake District. This in turn led to an Increased Intention to Revisit and Place Attachment by expanding tourists' cognitive maps during VR.

8.6. Summary

The purpose of the discussion chapter involved combining the qualitative and quantitative findings and presenting the main discussion points that have emerged. In this process, quantitative findings supported qualitative data and were able to produce new findings. This demonstrated the strength of the mixed-method approach that was able to provide better insights. In particular, new findings suggest how VR transformed the tourist experience by enhancing place realism through presence, triggering memories and transfer new place knowledge. Also, enabling the accessibility of various places at the destination was beneficial. Further, virtual gazing at the

landscape and enjoying the aesthetic experience of the Lake District in VR also added to the tourist experience by supporting the place experience. As a consequence, VR enhanced the overall tourist experience leading to Increased Intention to Revisit and Place Attachment. Moreover, the role of PA played a key part by revealing what type of experience was necessary to improve the change in attitude towards the Lake District. In this sense, key findings include presence for low PA tourists and new place knowledge for high PA tourists. Furthermore, the discussion demonstrated new knowledge extending current theoretical and practical implications. The introduction of new constructs and innovative methodological aspects enhanced the current debate within PA, VR and the tourism literature. However, there also limitations and directions for future studies that will be discussed in the next chapter.

Chapter 9 – Conclusion

9.1. Introduction

This chapter presents the closing thoughts of this study. In this sense, the first part includes how each research objective of this thesis was achieved. Afterwards, the study's contribution is presented. In particular, the conclusion outlines the theoretical, methodological, and practical contributions. The final part discusses the limitations and recommendations of this study.

9.2. Conclusions

The first part of the conclusion of this study includes an evaluation of the research objectives of this study. Overall, three research objectives guided this study. The first objective refers to the literature review and allowed to identify the research gap and described the context of this thesis. The need to close this research gap was achieved through primary research and are reflected in objective two and three. Hence, objective two developed the PA framework and the third objective involved proposing and validating the framework.

9.2.1. Research Objective 1: To critically review place and place attachment, Virtual Reality and rural tourism as experienced by tourists

The second chapter of this doctoral thesis explored the concept of place and place attachment which was the main theory of this study. Therefore, the concept of place was reviewed, and definitions and the importance of places were outlined. In this sense, it was also explored how humans perceive and evaluate places. This was a key element since the concept of PA theory focuses on the relationship between places. It was found that definitions include mainly physical and social aspects of places. Therefore, this chapter also suggested virtual aspects of places that are perceived and experienced by people. Furthermore, the chapter explained theoretical and methodological key concepts and provided insights on how PA theory has evolved. The analysis revealed a number of different conceptualisations from different research disciplines. Based on the critical review on PA theory this chapter was also able to identify the key dimensions of PA, in particular within the rural context of a National Park. In addition, it was also possible to provide theoretical justification to consider PA as a formative measurement that contributed to objective three. Moreover, it was investigated on how PA is experienced nowadays by tourists. Thus, showing how tourists form bonds to their favourite destination. In addition, it was also examined the various theories used in combination with PA with a focus on leisure and tourism studies to identify the lack of research. The literature review on PA revealed the increased importance of PA in tourism and the benefits for tourist destinations. In this sense, PA theory outlined different theoretical and empirical progress within the physical and social environment of tourist destinations. However, this study has shown through objective one that there is a research gap when it comes to VR places. Considering previous research within the context of AR and PA, increased interest of studies revealed the opportunity of immersive technologies to enhance the bond to tourist destinations. Hence, objective one provided theoretical justification for further exploration within VR as PA studies solely focusing on the physical and social environment but neglecting the virtual environment. Hence, the second chapter demonstrated the importance of PA within the tourism literature and other disciplines that have emerged in the last 10 years. This provided the theoretical foundation and background to understand the relationship between tourists and destinations. In addition, the critical evaluation of different theories and research areas allowed to formulate the research question of this study.

The third chapter of the literature review discussed VR as part of the context of this study. The chapter reviewed definitions and important concepts of immersive technologies as well their wider applications. The chapter explored the aspect of virtual experiences and the key features of using immersive technologies such as presence and other concepts that are part of that experience. Furthermore, since the number of fully immersive VR studies in tourism increased in the last few years (Beck et al., 2019), it was important to review the power of VR technology as a new medium. In particular, what are the differences to previous technological developments such as ICT and other non-immersive technologies and how the fully immersive VR experiences impact users. In this sense, the literature review revealed several positive effects of VR for tourists and tourist destinations. In particular, VR technology is constantly changing but revealed how powerful VR is to transform the tourist experience can enhance the bond to the destination by evoking memories, bring tourist closer to the destination through the presence and also transfer new knowledge. In this context, it was identified

that the VR experience is close to real experiences allowing people to engage with places virtually in many ways. The explored positive aspects of VR were perceived as beneficial about PA theory as the VR experience added new value to the overall tourist experience. Thus, in combination with tourism studies, the focus of VR applications was to identify outcomes for tourism and how VR affected the tourist experience. Therefore, the chapter helped to identify the theoretical and practical implications and to further refine the purpose of this study. Hence, to demonstrate the theoretical and practical implications of VR in tourism, the chapter helped to position the study within VR studies and to expand knowledge and the opportunities for tourism business and tourists.

The fourth chapter related to the rural environment and the idea of rurality. This chapter provided one part of the context that related to the Lake District as a rural tourist destination. The concept of rurality plays a key role when tourists evaluate rural places. In this sense, a key concept of rurality involved the rural idyll that encourages the positive evaluation of rural places. This objective found that the positive assessment is part of the dichotomy views on rural areas that are differently perceived by tourists and local residents. In this sense, the romanticised view of the rural area enhanced the positive meanings that are attached to places. However, this is not always in coherence with the existing problems and difficulties that local residents are faced with. Therefore, the critical evaluation of rurality informed this study to understand the mindset of tourists that are attached to rural destinations.

Furthermore, it was found the rural idyll shaped the viewpoint to classify tourists' responses in the interviews and allowed to gain a deeper understanding of tourists' values, meanings and perceptions that are attached to the Lake District. Hence, this objective enabled to evaluate the meaning of the atmosphere and aesthetics value of the Lake District's landscape during the VR experience. These important aspects in combination with the second chapter helped to further understand the emotional investment that is manifested in various layers through the rural idyll and impacts the degree of the attachment level to the Lake District. This was also important for the discussion of the findings to understand tourists' motivation and providing a more indepth explanation of their behaviour and change in attitude. Another identified crucial aspect by reviewing the rural tourism literature referred to the tourist gaze that is widely

known of the visual consumption of rural landscapes. This key dimension was also found significant in this study helping to explain the visual consumption in VR. This objective identified the critical aspects that differentiate rural places from other destinations. Hence, what values are reflected in tourists' bonds that are attached to rural destinations. In addition, findings also suggest how VR can be implemented by destination organisations to enhance the tourist experience and thus, providing benefits to rural destinations in order to stay competitive. This also includes to prepare them for future generations.

This study brought together different disciplines by developing new theoretical and practical relevance for tourism research. This was achieved by showing how the three literature review chapters were related and complemented each other. Based on the symbioses of these research disciplines the research question was developed and guided the research process of this study.

9.2.2. Research Objective 2: To identify key constructs of a place attachment framework in the virtual reality rural tourism context

The fourth objective involved to identify key constructs as a first part of developing a PA framework. For this purpose, the first phase of the mixed-method data collection stage included semi-structured interviews. The aim was to identify new constructs that emerged during the VR experiences and questions were asked in relation to PA theory. In this sense, participants interviews took place at the destination level and the sample included 25 interviews with repeat domestic tourists at the Lake District. This approach allowed to assume that repeat visitation behaviour expressed a certain level of PA to the Lake District. The interviews aimed to explore the impact of the VR experience on tourists' attachment and relationship to the destination. Hence, the key focus was to gain insights of the application of fully immersive VR technologies on tourists' attitude and perception of the Lake District. The findings of the first stage revealed seven themes that were considered relevant within PA theory.

The first important theme is *accessibility* and has a theoretical and practical meaning for tourists. The former relates to the fact that place is a key dimension of PA theory. Therefore, accessing the destination through VR reconnects tourists with the place. This in combination with the practical meaning it enabled tourists to keep up their bond

and continuing with their emotional attachment with the Lake District. This theme contributed to accessible tourism but also demonstrated the importance of VR for PA theory as accessing the place is required for fostering attachment. The second theme aesthetics reflects the aesthetic values of the Lake District that was experienced during the VR experience. It showed that VR was able to highlight a number of beautiful aspects of the landscape that were authentic and added to the overall aesthetic experience of the Lake District. The third theme that was found during the qualitative stage was *atmosphere*. This theme reflected atmospheric features of the landscape. The VR experience was able to transport the atmosphere of the Lake District. For instance, tourists pointed out how the weather, the colour of the trees and also the sound add to the experience. This was perceived very positively and contributed to tourists' emotions. The fourth theme was presence showing how VR experience mentally transported tourists' mind to the place they were experiencing in VR. Presence is a key aspect of any VR experience and was also confirmed in this study. The feeling of 'being there' provided a realistic representation of the destination. In this sense, tourists had the feeling of experience the Lake District that was also comparable to their previous experiences of the place. The fifth theme identified is memories. In this context, VR triggered memories and tourists were able to remember their previous engagements with the Lake Districts. Having fond memories of a place is a critical dimension in PA theory as bonding to a destination is reflected through past experiences. Hence, showing the Lake District in VR, led many tourists to remember their past visits during VR. The sixth theme that emerged was increase place knowledge. From a PA perspective, the more knowledge people have about a place the more meaning can be attached to it. The findings demonstrated how VR enhanced the knowledge about the Lake District. Because of the angle of the VR experience tourists were able to observe more landscape elements and put existing knowledge into a new perspective.

These six themes were identified through the qualitative phase. However, in order to complete the framework interview findings were linked to the literature. In this respect, also new constructs were formed in order to answer the research questions. The newly created constructs were 'Increased PA' and 'Increased Intention to Revisit and Place Attachment' and served to capture an increase of tourists' attachment after the VR

experience. Therefore, based on the qualitative findings and literature review the PA framework of this study was proposed.

9.2.3. Research Objective 3: To present and validate the proposed place attachment framework for VR in rural tourism

This objective related to the validation of the proposed PA framework that was developed during the first research stage. In this sense, objective three represented the second research phase and hence, the quantitative part of the mixed-method approach. In order to investigate the proposed relationships of the PA framework a survey with178 tourist was conducted after they tried a VR experience of the Lake District. The data was analysed with PLS-SEM and represented the main findings of this study. During the quantitative analysis two constructs were merged as suggested through the discriminant analysis. Furthermore, reliability and validity of the model was established, and the final hypothesis were formulated. Overall, the model had seven hypotheses and three moderator relationships. The analysis revealed positive impacts of 'Aesthetics' on 'Presence' and 'Memories', positive impacts of 'Accessibility' on 'Presence' and 'Memories'. Furthermore, positive, and significant relationships were also found between 'Presence', 'Memories' and 'Increased Place Knowledge' on 'Increased Intention to Revisit and Place Attachment'. In terms of PA as the moderator variable, one hypothesis was not found significant, namely between 'Memories' and 'Increased Intention to Revisit and Place Attachment'. In this respect, the proposed model identified known constructs but also proposed new constructs and confirmed their significance and validity. Hence, the proposed PA framework adds new established constructs that were significant within PA and enhanced current research within PA, VR and tourism. More precisely, the proposed framework is considered as unique because it is the first model that is particular developed for PA theory within VR and tourism. Thus, this model demonstrates a first step to integrate fully immersive VR experiences into PA theory that are relevant to enhance the tourist experience. Furthermore, this proposed model can also be used as a starting point for further explorations to investigate further important PA aspects that are critical for PA. In this sense, the model can be further redefined including to increase its reliability and validity.

9.3. Contribution to Theory, Methodology and Stakeholders

This study provided several contributions that can be categorised in theoretical, methodological, and practical contribution. In this sense, the findings of this study expand knowledge to several research areas. The first contribution referred to the expansion of theoretical knowledge. The second contribution adds new concepts to the methodological discussion. Lastly, the study also presented practical contribution showing the application of VR for stakeholders.

9.3.1. Theoretical Contribution

The main theoretical contribution is based on the newly created knowledge of this study expanding on PA theory. This was evident through proposing and validating the PA framework as a theoretical concept that was developed in this study. This demonstrated how PA increased within the VR context for a tourist destination. In particular, the explorative nature of this research proposed new theoretical constructs for PA and therefore, findings expanded PA theory by incorporating the VR environment as an additional place besides the physical and social place (Scannell and Gifford, 2010a). Although, it was a digital representation of the physical place, tourists experienced a fully immersive VR experience and therefore, feelings, perceptions and experiences took place within the virtual place. By shifting into the virtual environment, this study demonstrated how PA theory benefited from VR and the identified new constructs explained how immersive technologies can be applied in PA theory. Hence, this can be viewed as expanding PA theory by considering the VR experience as part of the people-place relationship that is manifested through PA.

The first contribution of this study refers to the proposed PA model considering the first study that explored PA within the VR and tourism context. In this respect, the exploratory study revealed that accessibility and aesthetics had an indirect effect on Increased Intention to Revisit and Place Attachment while, presence, memories and increased place knowledge had a direct impact. In particular, the concept of accessibility, as presented in this study, and aesthetics influenced the presence and memories of tourists. These constructs are not reflected in the PA and VR context but demonstrated to be a crucial VR experience on enhancing PA. Moreover, increasing place knowledge was perceived more important for higher attached tourists, whereas consuming the place via presence was more important for lower attached tourists. Although, presence as part of the VR experience is well documented in VR research,

exploring its effect in PA revealed positive outcomes that were not considered so far within PA theory. In addition, studies demonstrated the effects of increasing place knowledge to place engagement, however, the effects within a fully immersive VR context were unclear. This gap was addressed and hence, contributed to PA theory by showing the positive outcomes for tourists. Moreover, also memories played a key part in tourists' VR experience since VR served as a bridge between past and present. Considering that place memory is a key dimension of tourists' bond to a place it was first explored in this study and a VR setting.

Secondly, there is lack of theoretical foundation in fully immersive VR studies as several studies argued (Yung and Khoo-Lattimore, 2017; Beck et al., 2019, Wei, 2019). In particular, no environmental theories were applied so far (Wei, 2019). This study explored the application of an environmental theory within an immersive technology and tourism context. Therefore, another theoretical contribution adds to the VR literature by expanding the number of different disciplines. This enhances the theoretical and practical understanding of the impact of VR technology. According to Yung and Khoo-Lattimore (2017) in a systematic literature review on AR and VR in tourism, the authors identified a lack of theory driven research with great potential for sub-sectors in tourism. In this context, studies on on-site VR experiences are rare (Beck et al., 2019) and hence, the implications for tourist destinations are widely unknown. This also includes theories that look at the on-site tourist experience. Consequently, also tourism research benefits from findings of this study as PA is successively more considered in tourism studies.

The third contribution can be linked to the moderation effects of PA. VR was found significant in impacting tourists' attachment based on their existing PA level. The findings revealed that the type of VR experience had a crucial impact on tourists' change in attitude as it was perceived differently between lower and higher attached tourists. Hence, it was revealed that the role of PA is more complex and had a distinct effect on the tourist experience. These findings are new and provided a deeper understanding of tourists existing PA level and consequently, refining PA theory for tourist destinations.

Overall, all new themes can be linked to tourists' cognitive, emotional, and behavioural attitudes. These aspects are all relevant to PA theory explaining how tourists form

bonds to tourist destinations. Hence, by identifying new themes within a VR context this study contributed to the theory of PA showing how VR enhanced attachment and intention to revisit to the Lake District. In particular, the theoretical PA framework demonstrated the integration of the VR experience into PA theory. Therefore, the proposed PA framework represented the main theoretical contribution of PA within VR for a rural tourist destination.

9.3.2. Methodological Contribution

This study has a number of methodological contributions. Firstly, new construct and variables of PA within VR were created and tested. Hence, new and existing items for the questionnaire were developed and formulated to fit into the VR context. Their reliability and validity were established through the quantitative analysis. The new constructs and items related to accessibility, aesthetics, memories, increased place knowledge and Increased Intention to Revisit and Place Attachment. Although, in some cases literature was used to develop the items, they were reformulated to match the VR context. Thus, the items for each construct were new and tested the first time. In this sense, future studies may apply them within a similar research context.

Secondly, a newly created construct was 'Increased Intention to Revisit and Place Attachment' aiming to capture the increased effect of VR on PA. As discussed in chapter (7.4.1.3), this construct was merged with the firstly created constructs 'Increased PA' and 'Increased Intention to Revisit'. This was possible as theoretical and empirical justification was given and was firstly presented in this study. Hence, the empirical analysis demonstrated the exploratory character of this study that was also enabled by using PLS-SEM as it allowed to measure complex relationships in order to create theory.

The third contribution relates to the application of using PLS-SEM that enabled to measure PA as a reflective-formative model. This approach is barely applied within PA and tourism research, but this study demonstrated its empirical approach and provided theoretical arguments (Chapter 2.7) why PA should be treated as a formative model. As fourth contribution involves the application of a mixed-method research design as combining methods in PA and tourism research are scarce. In this sense, this thesis demonstrated the synergetic strength of combing two methods in order to test and validate the exploratory study approach. As a fifth contribution, this study used PA as

a moderator variable demonstrating its tremendous usefulness to provide more nuance results. Considering there was solely a handful of studies using this approach in tourism research, the results suggested the power of exploring PA as a moderator in order to reveal differences between the constructs. In particularly, the moderation effect of PA provides a much better understanding of different tourism groups and how their attitude is changing. Hence, this doctoral thesis outlined a number of methodological contributions that adds value to the diversity of research approaches in PA and tourism research.

9.3.3. Practical Implications

This study also suggests practical implications for several stakeholders. Firstly, VR was identified as a new tool and allowed a substitutional on-site experience. In particular, the ability to substitute tourists' travel with disability without the need to travel physically to a specific location. In this regard, the key benefit of using VR at the tourist destination related to more accessible tourism. With regards to accessible tourism, VR can be perceived as an additional tool to mitigate this issue and is strongly recommended to be offered as an additional type of experience. Another aspect to mention here might relate to the assumption that VR could be a potential threat to substitute travel instead of visiting the destination. However, the findings of this study argue quite the opposite by showing that VR enhances the tourist experience by offering a *novel* experience that can maintain the relationship to the place.

This also includes any reasons that restrict tourists to travel around the Lake District. For example, considering the current covid-19 pandemic situation, the VR experience could offer a great experience for tourists to visit their places digitally and to satisfy their longing to travel. This is turn, could led them to stay in contact with the destination and to relief the pain of staying at home. As shown VR has a variety of different function for tourists at the destination level. However, due to the travel restriction some of the outcomes of this study could have been relevant for people using VR at home. By experience the Lake District in VR a sense of being at the destination could have been established through presence. This feeling of experiencing the destination at home could serve to trigger memories and positive emotions. This could also be a shared experience leading to forget of being isolated and let the mind travel to the Lake District. A continuity of the self with the place could be achieved by reliving holidays and diminish potential negative consequences of not being able to travel. Hence, VR could be considered as a tool to mitigate negative psychological impacts due to the pandemic. It is believed that many people could benefit positively from VR by substituting a travel experience that was not possible.

Secondly, the complementary function of VR allows to extend the tourist experience with a digital experience. To fully understand the benefit of VR for tourist destinations it is important to identify the role of PA for tourists. This allows to categorise tourists based on their expectations and needs of the Lake District and consequently, to provide the right experience for each group (Gross and Brown, 2008). In this sense, VR showed to enhance the current travel experience positively, but differently for two groups of tourists. In this respect, the specific detail about the type of experience needed for each group was able to be obtained from the moderation effect of PA in the model. Thus, it was possible to specify the requirements for high attached and low attached tourists to the destination in regard to memories, presence, and increased place knowledge.

The importance of memories is equally for both groups and therefore, the destination management can use VR to trigger tourists' autobiographical memories to the destination. This emotional experience could lead to a closer personal experience reminding them of their past experience and to connect them more strongly with the destination. In terms of presence and increased place knowledge, the results suggest aiming for a different strategy. In particular, for low attached tourists, tourist marketers should shift their focus on utilising the concept of presence of the VR experience as part of the overall tourist consumption at the destination. This means, to expose tourists to the place and showing the landscape and importantly to capture the aesthetics and atmosphere of the rural destination. Hereby, the virtual gaze upon the landscape is proposed since the visual sense has the strongest impact on the tourist experience (Agapito et al., 2017). For the low PA group, the VR content could be focusing on presenting many different places within the Lake District. Hereby, a variety of the landscape would be beneficial and showing the beautiful areas that can be explored within the Lake District. This may also include the variety of different activities that may range from boat trips, hiking, climbing or other popular adventures. Hence, destination management organisations, should highlight the experiential site of the Lake District in VR. For this group the virtual consumption of the destination is the key benefit of VR as their overall place experience may be limited. The VR experience could be treated as a tool for place promotion pointing out what the destination has to offer and what activities can be undertaken. Hence, the focal point of the VR experience should be aimed to promote the diversity of the Lake District on the micro level showing how to expand the tourist experience. This may include showing certain main attractions or landscape pieces that are very popular by tourists. The VR content may also include stories told from a personal level demonstrating the number of different activities.

On the other hand, for high attached tourists, destination managers should focus on providing new place knowledge about the Lake District in VR. The findings are suggesting that destinations should provide novel and educational content in order to enhance their experience. Hence, for both groups, VR increased tourist's attachment levels, but the type of experience differed and should be reflected in new products or services when they are being offered. The positive effects of VR demonstrated to strengthen and upkeep tourists' attachment with the place and increased future intentions to revisit the destination more strongly. Therefore, destination managers can choose different VR experiences for tourists to encourage place exploration and to achieve a higher commitment to return to the destination. Therefore, the VR content for high PA should aim to provide a more holistic perspective of the Lake District. The key benefit for using VR lies in summarising their entire place experience in VR. Therefore, recommendations for destinations, should consider VR as a tourist experience on the macro level for high PA groups. This macro perspective may provide a full picture of the Lake District. By capturing the entire place, VR may reveal missing pieces of tourists' place experiences. Therefore, VR content should focus on showing large areas of the landscapes and try to capture the entire destination. This could be achieved by filming the place from a higher ground and provide a holistic view of the Lake District.

Thirdly, innovative technologies such as VR will also impact the tourism sector and using state of the art technology will be part of how young tourists will consume products and services in future. In addition, technology reflects a key source for destination innovativeness and by providing a technology-mediated consumer experience the tourist experience may be enhanced at the pre-stage, on-site and post-stage (Flavián et al., 2019; Neuhofer at al., 2012). Thus, VR provides a novel tourist

experience for rural destinations and can improve a destination's economic situation since tourist organisations may face stagnation or decline in growth (Lane and Kastenholz, 2015). This study shows how VR can enhance the tourist experience at the destination level and hence, providing value that may lead to higher demand (Flavián et al., 2019). However, VR may have an impact on DMO's image-building process and therefore, be a crucial marketing tool at the pre-stage travel phase (Gibson and O'Rawe, 2018). Furthermore, VR may also be used as tool to enhance sustainable tourism for certain areas as there is an interest in reducing environmental damage (Cobbinah, 2015) or second change tourism (Bec et al., 2021) as it can provide real experience and therefore be used as a substitutional experience which is has positive outcomes for the destination and tourists.

Fourthly, this study may involve providing useful information for software developers of VR applications for the tourism industry. As outlined before, different target groups are looking for a different experience and have different needs. Therefore, users appreciate tailor-made enjoyable and functional VR experience (Herz and Rauschnabel, 2019). Thus, the enjoyable experience of this study can be linked to create a VR application for rural destination to let tourists gaze upon the landscape and enjoy the aesthetical and atmospheric features of the destination. The findings suggest that VR applications for rural destinations should focus on attributes to enhance tourists' aesthetic perceptions such as light, colours, the view of the landscape and thus, to capture the beauty of a rural destination. On the other hand, accessibility and providing new knowledge may increase the functional aspect of the VR experience. This information may be relevant to consider when developing a VR application for rural destinations.

9.4. Limitations and Future Recommendations

9.4.1. Limitations

As in every study, there are a number of limitations within this research context. The first limitation can be linked to the fact that this study is an exploratory research and thus, the first study of presenting a PA framework within a VR and tourism context. Although, reliability and validity were established through the empirical stage, more studies are needed in order to confirm the newly introduced constructs and relationships. Also, expanding the research context to more than a single National Park would lead to the ability to compare and support findings. In addition to that, this

limitation is also linked to the time and financial restrains that is a key factor when doing field research. Thus, a limitation of this study represents the ability to generalise the findings to the tourist population of the Lake District.

Another limitation could be referred to the sample size of both research stages. For the research stage one, more interviews could have been beneficial to reveal further insights. Although, sample size is not a key factor in qualitative research, the semi-structured interviews could have been longer if there were no time-constraints from tourists. This could have been mitigated by selecting tourists that would agree for longer interviews but also demanded more resources. For the quantitative stage the sample size was considered as optimal but, a larger sample size could have strengthened the measurement model. Hence, based on the sample size for both research stages, an increase in the sample size would have been more desirable. In addition, control variables for the measurement model were not included. Although, this study tested gender as a control variable with no significant effect. Since the scope of this research was exploratory and to propose the first PA framework within VR the literature review of this study did not consider the inclusion of control variables. Hence, the lack of control variables was considered as an additional limitation of this study.

One of the obstacles of this study was that most tourists experienced VR for the first time during the data collection phase. In this circumstance, the 'novelty factor' could have impacted tourists' responses as they showed more enjoyment for the technology itself instead of the content (tom Dieck et al., 2018). Furthermore, for most of the questions in both research stages, the survey and interview questions started right after tourists had the VR experience. This could have contributed to inaccuracy and biases as response relied on participant's recollection (Tussyadiah et al., 2018). Moreover, the quality of the VR application could have impacted the findings of this study. The application was developed in 2016 and therefore did not have highest image resolutions. This could have impacted tourists' VR experience in terms of visual quality. According to Schnack et al. (2019), a lower resolution can lead to a negative visual experience. This issue could have been reinforced by visual Therefore, updating or creating a newer VR application could increase the overall visual experience.

9.4.2. Recommendation for future research

This study explored PA within a VR and rural tourism context. Hence, the research was conducted within a certain scope. However, to expand knowledge further, one of the recommendations of this study is to conduct research from different theoretical angles. This study used an EP theory that is scarcely applied within VR and tourism. To consider a number of different theoretical frameworks may extend current knowledge about the effect of VR on tourists' behaviour, attitude, and decision-making process. Therefore, different research disciplines may contribute to a better understanding of how to enhance tourists' attachment within a fully immersive technologies setting. In this sense, to enhance the diverse theoretical foundation the literature provides a number of related theories explaining the people-place relationships. Similar to this study context, attachment might be explored by applying theory of planned behaviour (Anton and Lawrence, 2016), self-regulation theory (Baumeister et al. 1994; Baumeister and Vohs, 2007; Korpela et al., 2002), Attention Restoration Theory (Kaplan and Kaplan, 1989; Mattila et al., 2020), Interdependence theory (Davis et al., 2009), Biophilia (Wilson, 1984), Meaning theory (Casakin and Kreitler, 2008), Motivation theory (Prayag and Ryan, 2011) or Social Judgement Theory (Doherty and Kurz 1996, Kyle et al. 2004a). While these aforementioned theories are mostly placed within psychology and environmental research disciplines, also theories that are mostly found within a marketing context may be considered. In this sense, the attachment could be examined by using concepts such as brand love (Rauschnabel and Ahuvia, 2014), brand attachment (Park et al., 2010) or attachment to possessions (Belk, 1992). Hence, the literature offers a number of theories that could be applied in future. This in turn, will produce new insights about the relationship between tourists and destination within fully immersive technologies. In this sense, different theories would extent the knowledge of how immersive VR experiences may impact the relationship to places. Moreover, based on different theoretical angles control variables could also help to refine the PA framework and thus, including control variables such as locality, distance travelled, motivation to visit and other relevant variables might be helpful in future studies.

These new layers of findings may be also relevant for PA theory and provide a more in-depth explanation of other factors that contribute to tourists' attachment. PA theory can be considered as one aspect of why individuals form bonds to tourist places. However, this relationship can be complex as many other factors can also be considered. Therefore, other research disciplines may add valuable insights that can lead to further explorations within PA and other relevant theories.

Moreover, conducting additional studies in other rural and non-rural destinations could reveal new themes and/or confirming the proposed constructs. In addition, difference could be identified between rural and urban tourist destination. This helps to refine and validate the proposed PA framework by testing it in a similar setting or helping to refine it within a different context. In this respect, this study focused on domestic tourist. Further research could include international tourists in order to reveal differences. Moreover, to include a larger sample size for the PLS-SEM may strengthen the empirical findings. Furthermore, additional research methods such as focus groups or pictorial measures (Lewicka, 2011) might produce richer data and by combining research methods theory can move further by exploring tourists' VR experience from different views.

In terms of technology, an improved VR application with a higher video image quality and resolution might enhance the overall visual quality. This might be interesting to examine if an improved quality influence tourists' perception of the destination. Furthermore, new technological developments also provide haptic (Kim et al., 2017a) and olfactory sensors (Amores et al., 2018). Since this study focused mostly on the visual sense, additional senses may even increase the tourist experience as the VR experience becomes a multi-sensory experience. Thus, more information about the VR technology could help destination managers' decision about using VR devices at the destination.

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Appendices

Appendix 1 - Consent Form and Purpose of the Study

Christos Pantelidis-PhD researcher Faculty of Business and Law Manchester Metropolitan University <u>christos.pantelidis@stu.mmu.ac.uk</u>

Manchester, 25th July 2018

Information sheet

Dear participant,

My name is Christos Pantelidis and I am a PhD researcher at Manchester Metropolitan University. For my PhD study I am examining how virtual reality influences tourist's experience. Therefore I am looking for adult tourists at Lake District National Park. I would like to get your permission to test the virtual reality application and afterwards to conduct an interview with you. The findings will help me to develop a framework for virtual environments.

It is not expected that you will feel uncomfortable during your virtual reality experience. However, in some cases people feel some degree of nausea. In addition, any experience with video equipment might trigger epileptic seizure, migraine, vestibular failure and other seizure driven neurological conditions. Therefore, we regret and we are unable to accept volunteers with such neurological medical conditions. Furthermore, after each usage the VR headset will be wiped with a non-alcoholic anti bacterium to ensure no transmission of any illness when using the same VR headset with other people.

All data will be treated confidential and anonymous and no reference will be made to you in any form. The data will be used for research purposes only. You will have the opportunity to withdraw from the research and all the data collected from you will be destroyed if you do decide to withdraw.

The interview will last around 15-20 minutes and will be audio-recorded and transcribed. The VR experience will last around 3 minutes. Moreover, the transcription of the interview can be send to you if you wish to see it before your interview is used for further analysis. You can withdraw consent to use your data within two weeks of the interview or two weeks after you receive the transcript, if you wish to read this first.

The transcribed data will be kept and stored electronically on an encrypted machine until the end of 30th of September 2023. Furthermore, you can request to delete your data at any time after the interview if you wish to delete it. Moreover, the digital data will be anonymised and stored on encrypted platforms which are compliant with the University's data security guidelines. This means that the data will be stored in folders on the University's share drive and on OneDrive where access is only allowed to project researchers.

Since the audio-recorder is not encrypted the files will be uploaded to an encrypted laptop after the interview and afterwards the sound file with your personal data will be destroyed immediately by deleting the audio files from the machine. Furthermore, any physical copy of your questionnaire and data will be transcribed directly, uploaded and stored electronically to a secure location. Afterwards the questionnaire will be destroyed by means of shredding.

If you are happy to participate, please sign this form below. If you have any further questions please contact me on christos.pantelidis@stu.mmu.ac.uk

Thank you very much for your kind cooperation and I remain with best regards.

Christos Pantelidis

Appendix 2 - Additional Information about Data Privacy and Risk

1 Consent Form

box

Title of Project: Exploring Place Attachment Theory in VR of a Rural Destination: The effect of VR Experience on domestic tourist's attachment to places

Name of Researcher: Christos Pantelidis

Please initial

1. I confirm that I have read and understood the information sheet dated for the above project and have had the opportunity to ask questions about the interview procedure.

2. I am aware of the risks of using VR and confirm that I do not have any previous

medical neurological conditions such as epilepsy, vestibular failure or other seizure driven neurological conditions

3. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason to the named researcher. Any data will be

destroyed such as deleting audio files from the machine and/or destroying any questionnaire and other documents by means of shredding.

4. I understand that my responses will be sound recorded and used for analysis for this research project.

5. I give permission for my interview recording to be transcribed and archived until 30th of September 2023.

6. I understand that my responses will remain anonymous.

7. I agree to take part in the above research project.	
8. I understand that at my request a transcript of my interview can be made available to me.	
9. I agree to the use of anonymized quotes in publications	
Name of Participant Date Signature	
Researcher Date Signature	
To be signed and dated in presence of the participant	

Appendix 3 – Selection of Semi-Structured Interviews

Interview with Participant P22 and P23

Interviewer: Tell me about your current/last visit to the lakes? #00:00:00-0# Interviewee: P22 and P23: #00:00:14-8#

Interviewer: What do you do here at the lakes? #00:00:14-8# Interviewee: P22 and P23: Exploring and wandering the land and admiring the views. #00:00:10-1#

Interviewer: What do you like the most here? #00:00:17-1#

Interviewee: P22 and P23: The scenery. Some of the views are just peacefully. #00:00:26-4#

Interviewer: What meaning has this place for you? #00:00:26-4#

Interviewee: P22 and P23: We had our honeymoon here It is guite a nice place to come back. It is quite special for us. #00:00:34-6#

Interviewer: How would you describe your feelings? #00:00:47-2#

Interviewee: P22 and P23F: We love it, it just guite relaxing and peaceful here. (both laughing) #00:00:48-6#

Interviewer: You have good memories about this place, when was your honeymoon? #00:01:00-0#

Interviewee: P22 and P23: It was 10 years but it was not our first time, but this was our most significant holiday. We honeymoon holidays had the most meaning for us. #00:01:04-2#

Interviewer: Do you have any anniversary today? #00:01:13-7#

Interviewee: P22 and P23: Yes, it is 10 years. It is the first time when, usually we did a lot of walking, but it is the first when I have not been able to do that. We come to explore different parts of the Lakes and doing things that are accessible. #00:01:13-7#

Interviewer: VR... #00:01:35-2#

Interviewee: P22 and P23: They are talking about Grasmere. Grasmere, it is nothing as it where...they remembered some things. #00:08:19-4#

Interviewer: Have u seen all the places?

Interviewee: P22 and P23: No, not Tarn Hows. P22: Yes, we have, I was there. **#00:08:44-6#**

Interviewer: Is it the first you have used VR? #00:09:33-0#

Interviewee: P22 and P23: Man yes. #00:09:36-3#

Interviewer: Could you describe me your VR experience? #00:09:37-7#

Interviewee: P22 and P23: It was good, it shows you an experience you would not necessarily see. I love to see it from a different perspective obviously from a drone, which is quite different what you see from the ground. So, it is quite different and interesting. #00:09:45-5#

Interviewer: asking the women #00:09:47-1#

Interviewee: P22: I was, because I suffer from vertigo and dizziness, I thought it will be a bit more problematic than it was. It was good for that perspective. It is also particularly nice because we can't go ... for ourself and ... view, yeah we can't see. #00:10:13-7#

Interviewer: How did you like the representation of the Lake from birds-eye view? #00:10:16-0#

Interviewee: P22 and P23: It was quite different, it was good, it gives you a different perspective what is great. It gives you different views that you would not see otherwise. I suppose also, because it is not very good weather here, at least you could see the views where quite a lot of the time you can't. #00:10:29-7#

Interviewer: Did u pick up anything that you have not seen before? #00:10:41-4#

Interviewee: P22 and P23: You get a better of view of, so you have done a walk and you have seen the park, but it gives you the whole perspective and not just an individual

snapshot. You get a better perspective where you have been and what you have seen. #00:10:52-9#

Interviewer: What places have you seen before? #00:10:52-9#

Interviewee: P22 and P23: Grasmere, we have been to all of them at different times. #00:11:00-4#

Interviewer: What do you think about the surroundings of LD in VR compare to the real environment? #00:11:05-3#

Interviewee: P22 and P23: Not sure. #00:11:15-0#

Interviewer: Is there any difference? #00:11:18-4#

Interviewee: P22 and P23: It looks greener in the VR than it does in reality at times plus it is dark?? at the moment. It is quite realistic I think because it shows all the different, I don't know what the big things about the LD are, for me if it is sunny you get all the kinds of greens and you got all of those in the VR. It does not make things uniform coloury, just picks everything out, very nice. From that perspective it is so much more real than seeing it on a photo because you cannot get all these different colours. More distinction. #00:11:55-7#

Interviewer: In VR is it more colourful? #00:11:56-1#

Interviewee: P22 and P23: Yes, colourful and sharp and you get the different perspective, you get the 3D rather the photo. #00:12:03-3#

Interviewer: Is it much better than the real? #00:12:09-4#

Interviewee: P22 and P23: Not the real thing, but it is a different view you would not get otherwise because you would not be able to see from that VR thing. I suppose, it was really nice to have the audio as well, you could feel being there and listen to the environment. #00:12:24-2#

Interviewer: Did the VR change your relationship this place? #00:12:27-8#

Interviewee: P22 and P23: Not, but we would come back anyway regardless, but it was just nice to see a different sort of view, i suppose. I think if you are not yourself in the LD it is nice to actually have that and and you can see it and kind of to pretend to be

there for a while. If you had not been here before, I would say definitely it gives you a real feel for what it is like. But have been here for a few times it reinforces what you have already seen rather than anything new. Women: It brings memories back. #00:13:03-6#

Interviewer: What kind of memories? #00:13:03-6#

Interviewee: P22 and P23: Just thinking about the different walks and what we did there and see different things. And where we stayed, oh yes, we looked down this road did this, we went up there, we have seen the house before? etc. It was nice to see all these things in sun. #00:13:24-0#

Interviewer: Tell me about your feelings after your VR? #00:13:29-7#

Interviewee: P22 and P23: I suppose because we have seen a much bigger area in VR, it is kind of made me think o wow, actually it made me just go further? to field ? and see a bit more, come back again and to see something else. Man: Exploring further the field. Otherwise,...? how..? being reminded what it is like. #00:13:49-9#

Interviewer: Did VR encourage you to visit other places that u have not seen before? #00:13:55-7#

Interviewee: P22 and P23: Yes, I suppose, media places I think of other places that you kind of walked too, we did Snowdonia and like that, it just replaces when you can't get the whole perspective necessarily, you don't get it from the ground and you can't see the whole 360-degree view even on the top of the hills? So, somewhere like that to get the overall perspectives, it is nice. #00:14:41-8#

Interviewer: It is your first time here with your wheelchair? What do u think for yourself? How do you think it might change your future travel behaviour? #00:14:57-4#

Interviewee: P22 and P23: I guess, I was kind of? coming, because before we had always fell walking, so I carved it in my mind that there were a lot of obstacles to actually do what we used to do. We found alternatives that we have enjoyed but seeing VR as well is kind of pretty nice to get that perspective because I know I can't get up to myself. It is nice to be able to have at least the memories and what the view is like. And it is nice that Chris gets to see that because he does not go on his own. He stayed down. It nice to remember and think about things what we did do and enjoy it again. #00:15:49-1#

Interviewer: Do you think VR might substitute things you were doing before? #00:15:56-0#

Interviewee: P22 and P23: I guess so. It will offer some substitution we can't get the chair up there and I can't walk there, it offers that kind of substitution. Man: For the person who has been here it is reminding of things rather than substituting, o yes we have done this, but for someone who has never been here, oh that looks pretty, whereas, for us we have done this oh yes, it is very nice it remind us of how we had the moon over the walk. Woman: I was looking out for the person? and wanted to get out my binos out to get a proper zooming view. I enjoyed it. #00:16:43-5#

Interviewer: Since it was your first time, will you try out more VR in the future? #00:16:44-8#

Interviewee: P22 and P23: Yes, possibly. Potentially yes, it is nice. It is nice to have the 360-degree view, it was nice to have this immersed experience. #00:17:18-4#

Interviewer: Add or comments? #00:17:22-6#

Interviewee: P22 and P23: No, we enjoyed it.

Interview with P1 and P2

Interviewer: Tell me something about your current visit here at LD? #00:00:09-1#

P1: So, we came this morning and been to amble side first, we had a bit of a walk around and then we went to Windermere town and came down to Bowness. We did not have to pay for the parking in humble side so kind they give us a ticket. It was a pain. In Windermere we managed to find some free parking here I think it is 2 hours free. Lovely time. #00:00:48-4#

Interviewer: What do you do usually here in LD? #00:00:43-6#

Person P1: A bit of walking, boat ride. #00:01:04-5#

Interviewer: What meaning has this place for you? #00:01:08-3#

P1 and P2: We are both from a lake free area Lancaster. I suppose it is a place to relax, really positive place. #00:01:37-8#

Interviewer: How would you describe your feelings to this place? #00:01:44-6#

P1: I have got positive feelings and very positive memories about this place. P2: I never had a bad feeling about it, it is very busy sometimes, very touristic. ... #00:02:04-8#

Interviewer: What kind of my memories do you have? Are they connected to your childhood? #00:02:10-0#

P1: Yes, connected to the childhood times, times with family and times with friends. P2: We used to camp all the way around Windermere town. P1: The other week we went to a section that was a little less touristic, on the other side, towards where the ferry is. We had a fantastic time with kayak #00:02:34-0#

Interviewer: So, you know the Lakes and different places. #00:02:33-8# P1: (...) Having VR Experience #00:02:46-8#

Interviewer (Notes during VR experience): P1: It is very strange/ fantastic/ there is Buttermere, we were talking about visiting and camping next week/ stunning/ I get carry away on it/ wow/ there is a drone/ O there is Grasmere, lovely/ It is not my favourite... that was amazing #00:06:51-3# P2: Having VR experience: # #00:10:33-8#

Interviewer: How would you describe your VR experience. #00:10:40-8#

P2: Amazing / P1: Incredible. #00:10:45-0#

Interviewer: What did you like? #00:10:45-0#

P2: I like Buttermere, I think because I was doing much fell run, it was based on Buttermere and Grasmere, all that area. So, one of my favourite places. #00:11:00-3#

Interviewer: Do you know all these places? #00:11:04-6#

P1 and P2: Not all but we have visited most of them. #00:11:01-1#

Interviewer: How did you like the representation from the Birds-Eye View? #00:11:09-1#

P1: Yeah, I thought it was good. I thought some of the places it was little bit better than it was. I think I made several comments about Tarn Hows. You have to forgive me (laugh). P2: I liked it, it let me see the lakes in a view I have not seen before. P1 It is quite... (confirming what P2 said) #00:11:26-7#

Interviewer: Have you seen any new things? #00:11:35-5#

P2: Different views of other places you have been. P1 and P2 confirming Grasmere looks so much better in VR then, what it is. P1: I think Tarn Hows we did not see much of it. The town we have seen a lot more than the forest, which I am not particular familiar with it. So, it is quite nice to see it in a different way I suppose. #00:11:57-2#

Interviewer: Is there anything you did not like? #00:11:58-8#

P1: It was a bit grainy, the view. I suppose it is an emerging technology. #00:12:13-9#

Interviewer: Yes, the resolution is not very high. #00:12:22-7#

P1: In the same breath we still could see the lakes from the BEV, so you can't complain to much about it. It is incredible. #00:12:25-2#

Interviewer: How did you perceive of the LD in a VR environment? #00:12:35-7#

P2: Make them a bit more peaceful. P1: I can imagine some people would comment that it waters it. You know saying through technology, but I think it is really positive way of seeing things in a different way. P2: I think it is good because I may want to go that places now. P1 (confirming) yeah, it is a fair point. #00:12:53-8#

Interviewer: What kind of elements did you perceive of remember the most (like mountains, forest, lake)? #00:13:02-8#

P2: The [...]is in the lakes for me. P1 (remembers Honister pass) I was driving the van up and down the little roads and I could not remember all clearly. It was terrifying. Tarn Hows too. #00:13:25-2#

Interviewer: Do you think the VR experience changed your relationship to this place? #00:13:31-4#

P1: Yeah, I suppose so, in a sense, because you have seen it in a different way. P2: Yeah, I think it made me to appreciate more, liked more. I have not seen it from above. P1 I agree with it. #00:13:51-5#

Interviewer: Tell me about your feelings after the VR experience? #00:13:56-8#

P1: I suppose still positive feelings towards the Lake District, and I suppose still positive feelings towards VR. I was a bit sceptical about VR before participating and I thought it was a bit of a gimmick but that I ... quite positive. P2: I feel quite relaxed to be honest. #00:14:21-1#

Interviewer: Did it evoke any emotions or still as before? #00:14:36-9#

P1: It makes you to want to go to these places. P1 and P2 agree with that. #00:14:44-6#

Interviewer: VR experience future travel? #00:14:51-3#

P1 and P2 confirm. P1: Did you not say you want to visit Buttermere now? P2: No, you were almost commenting it, I would visit Buttermere anyway but it kind of make me to want to see Grasmere, it looks quite nice. #00:15:19-7#

Interviewer: Did VR encourage you to visit the places? #00:15:20-8#

P1 and P2: Yes. #00:15:26-2#

Interviewer: Substitution of VR? #00:15:36-4#

P1: I can see how some might want to see in a different way before they went for instance, having a street view of the area. But it is ...content to see it from a BEV, it is incredible. P2: I still think you need to go that places as well. P1 confirms. P2: To see everything yourself. #00:15:55-8#

Interviewer: Did the VR XP evoke any memories? #00:16:03-0#

P2: For me yes, I did my ...? all around Buttermere and that area. It is like to see the path that get alone the water..., P1 confirms. P2: all the way along the youth hostel zone. P1: I was thinking about the family walks we used to have in Tarn Hows, I was going them through again as we mentioned driving the van through Honister. #00:16:33-1#

Interviewer: Would you like to add something, comments? #00:16:40-0#

Person: P2: I really enjoyed it. P1: It was really positive. #00:16:50-4#

Interviewer: Thanks.
Interview with P3:

Interviewer: Tell me about your current visit here at the LD? #00:00:08-8#

P3: We are here on holiday; we have come up from Dyrham to have just a little look about. Just enjoying the scenery. #00:00:21-1#

Interviewer: What do you do usually? #00:00:22-9#

P3: I am admin assisent. #00:00:28-0#

Interviewer: What do you do here at the Lake District? #00:00:28-0#

P3 and P4: We do a bit of walking, just generally taking the scenery. #00:00:38-3#

Interviewer: What meaning has this place for you? #00:00:38-0#

P3: It has a sentimental value isn't it? P4: Yeah, it is when we first came here a couple of years ago. P3: We just got in together, so it was quite... #00:00:58-8#

Interviewer: Have you met here? #00:00:58-8#

P4: No, it was out first holiday to come here together. #00:00:58-6#

Interviewer: So, is this a special place for you? #00:01:01-1#

P3 and P4: Yes. (Both confirm). #00:00:59-9#

Interviewer: How would you describe your feelings to this place? #00:01:08-1#

P4 Honestly, it is a very naturally and beautiful place. There is no other place like this in England, I don't think. P3: I agree, it is so unique, I mean you go from so beautiful kind of wooden area to massive mountains. There is nothing like it. It is beautiful. P4: I think it is the mixture of the water, the trees and the mountains. It is just the magical form of it. #00:01:29-5#

Interviewer: How often have you been here at the LD? #00:01:34-5#

P4: Few times here before. P3: We have been here four times in the last three years. #00:01:47-7#

Interviewer: Is it one of your favourite places? #00:01:50-3#

Person: P4: Yes, it is. P3: It is our little kind of special place. #00:02:16-7#

Interviewer (notes): P3 and P4 having their VR experience #00:02:24-8#

P3 describes what she sees. She recognises several places. It feels weird because I should be flying up in the air. I can see the water from above. There is the lake, there is the village, there is a path etc. It is pretty high. That's so cool. #00:07:03-4# P4 is trying now: Also explaining what he sees. I am just above the lake. I see people walking. I am still above the lake. Where is this Tarn Hows? It hinges you, the eyes. What do you think? P3: I thought it was ok. Have not been there in Tarn Hows, let us go. P3: My brain said you should be flying but I was sitting #00:09:43-1#

Interviewer: Describe me your VR experience? #00:10:07-5# #00:10:07-5#

P3: It was really cool. P4: It was really good. I think it is very good for people who can't come to the lakes. For whatever reasons. P3: We had this discussion earlier actually. I was just saying that it is a shame that there is not more facilities for disabled people in this area. You have to be able to walk to be able to enjoy the experience fully. That is perfect for someone who is not able-bodied. Both agree and say it is very good. ...it is obviously you cannot outdoor facilities like this not be able that everyone can access to it. P3: Especially if you going to up, catwalks, which is in Keswick, I am able-bodied and struggles, someone who is disabled is not going to do it. So, it is an opportunity for them to enjoy something like that. It is a really good idea. P3: would like to have an audio-guided experience where a voice is telling if you look over there you see... #00:11:37-9#

Interviewer: What did you like by seeing the place from a different perspective? #00:11:39-9#

P3: I think for me, because I am the driver, I have never noticed certain features. So, I was able to see them from a different perspective as well. We have driven to Honister pass once before and it is fast and high you don't notice everything. So, it was nice to see from a different angle, so you get an idea where everything is. P4: You get the BEV, you kind of knowing? above the earth. #00:12:09-0#

Interviewer: What do you think about the surroundings of Lake District in VR? #00:12:28-3#

P4: It could be a bit more clearer, definite. It is quite a low kind of definition of the video. P3: I don't know how limited you are with a drone. A loop would be nice but may be you can't do it. It would be a nice idea. #00:13:10-1#

Interviewer: Have you picked up something? What did you like the most? #00:13:10-3#

P4: It is the idea of actually seeing it from above, which you don't actually see it until you climb up the mountain but you still don't travel when you on top of the mountain, that's that, that is the view you get. P3: Like you said, from the BEV you can so much. #00:13:33-4#

Interviewer: Have you seen something new, something you have not seen before? #00:13:36-6#

P4: No #00:13:48-2#

Interviewer: Do you think VR has changed your relationship to this place? #00:13:49-2#

P4: I would not go so far. It is maybe a greater appreciation of the beauty of the place. P3: There is definitive a greater appreciation, but we have such an affection for the lakes anyway, but I don't think it could be [...] by something like that. But it was lovely to see something like that. P4: But the application serves best for persons who are not able to access the facilities here at the lakes. P3: Especially the touristy kind of sights like Catbells, like Windermere, the mere and walks around here. Especially Buttermere, such a lovely area but it is just not accessible for people who have disabilities, so something like that would be really good who is not able-bodied. #00:14:35-8#

Interviewer: Tell me about your feelings after your VR experience? #00:14:45-6#

P4: I don't think it is such a profound experience. I kind of agree, it was lovely to see but has not changed my opinion. We already had a high opinion for this place. We have such an affection for it is just a kind plateau level. #00:15:11-1#

Interviewer: Do you think VR might impact your future travel? #00:15:10-4#

P3: May be not here but maybe somewhere else. P4: I think there are a couple of places there where I have not been to and I think it possibly I would like to actually investigate those places in future, like Tarn Hows, I have never heard about it before (P3 also confirms that she never heard about it), but it would be nice to see. If they had more videos and more places within the lakes, we have not actually explored before and you get a sneak peek of it how it might look like. That would be fun and also other places around the country. #00:15:45-8#

Interviewer: All the places are familiar to you? #00:15:54-5#

Person: All the places are familiar except Tarn Hows. #00:15:59-9# #00:16:11-8#

Interviewer: Any VR experience before? #00:16:22-2# Person: No, just #00:16:50-7#

Interviewer: Would you like to add something, comments? #00:16:53-6# Person: Thanks.

Interview with P16 and 17:

Interviewer: Tell me something about your current visit here at Lake District? #00:00:08-

P17: We arrived this afternoon. We had a round with the kids. We want to do boat trip tomorrow and take them to the other side. And then we have looked at some places where the boat goes to across the like and hire some bikes and explore. That is the plan for tomorrow. Today is just relaxing #00:00:38-6#

Interviewer: When was your last trip to the lakes? #00:00:40-4#

P17: I think two years ago. #00:00:46-3#

Interviewer: What meaning has this place for you? #00:01:13-7#

P16: Something new, something different. There is somewhere in the UK nice area, nice scenery. P17: Just somewhere ... where we can come together and have a nice holiday. #00:01:28-1#

Interviewer: Why did you choose Lake District? #00:01:28-1#

P16: People recommended, we wanted to try something different. #00:01:48-9#

Interviewer: What makes this place so special? #00:02:00-4#

P17: Female: The scenery and the lake itself, it is tranquil and all the boats, it just feels magical. Magical. #00:02:08-4#

Interviewer: What are your feelings towards this place? #00:02:09-9#

P16: I feel like I am abroad, all the coffee shops and the restaurants, you feel like more on the continent than actually in the UK. P17: I feel relaxed, I feel... in the world. I like the history, where my child can used to go, we took the girls to Beatrix's potter museum to have a look. #00:02:55-5#

Interviewer: P16 and P17 having their VR experience #00:03:49-1#

P16: That is crazy, it is insane. Absolutely mental. I have never tried this before. This is so surreal. It is absolutely massive. Oh yes, that was brilliant. this is so freaky, this is so bizzar, wow, this is crazy. When you are going up, you are rising with it. You actually feel like you are being there!. #00:10:45-7#

Interviewer: How would you describe your VR experience? #00:11:08-1#

P16: It was my first time, it was really interested and intriguing. I am scared of height, some of the ideas when you are rising up, actually I felt like I was there when I was rising, very bizarre. #00:11:25-7#

Interviewer: Were you afraid? #00:11:30-3#

P16: Yes, I felt like I was there, and it intimidated me a bit but for the rest I felt quite safe. I did feel like being there the entire way watching the audio. Everything you move your head around, you moving the camera, and everything is going with? It was brilliant. #00:11:42-1# #00:11:45-2#

Interviewer: How about you experience? #00:11:47-3#

P17: It was my first time doing this and I felt it was absolutely fantastic. I felt like I was flying, it was the view of the lake, I have been to Grasmere before obviously, but I have never seen it like this before. It is just amazing and just to see a view like that you would never see unless you are actually flying. #00:12:11-8#

Interviewer: What was new? What did u pick up? #00:12:14-9#

P17: I have never seen Grasmere like that, I have been to the village but I have never realised how close it is to the lake side and the rest of it. Just seeing the scenery to be honest, it is a view like, I have driven... P16 (interrupting): You feel like to be on a helicopter and looking down, this is the best way to describe it. On the ground level you cannot see so much but that looks fantastic, you are feeling like watching it all. #00:12:44-8#

Interviewer: How do you like the representation of the Lake District from BEV? #00:12:49-9#

P16: I mean you use this as a tourist tool. You want to come here to see for yourself. #00:13:01-0#

Interviewer: What did u like seeing from the new perspective? #00:13:03-2#

P17: I like seeing the lakes, because I have not seen them like that before, I have never seen Grasmere that way before. It may want to..? But now I really want to take them there, after seeing it so, we take them (kids) to Grasmere now. #00:13:29-8#

Interviewer: What do you think about the surroundings of the LD in VE? #00:13:33-0#

P17: I thought it was great, it was fantastic. It looks very beautiful. P16: It looks like exactly like it should. #00:13:47-7#

Interviewer: What is the difference if there is any to the real? #00:13:57-1#

P16 and P17: (Both agree), you can see everything as it is. You can see more than in reality because of you are in the air and you are above the trees. #00:14:11-2#

Interviewer: You see more in VR? #00:14:12-4#

P17: Yes. #00:14:15-5#

Interviewer: Has VR changed your relationship to the place? #00:14:20-2#

P16 and 17: Yes, because we will go now and see Grasmere now, definitely. #00:14:30-7#

Interviewer: Tell me about your feelings? #00:14:30-7#

P17: I feel wow, I love it, I really much like it, it was amazing. I know more about the place now. #00:15:02-6#

Interviewer: Did VR brought some memories back? #00:15:06-8#

Person: Some of Grasmere, it showed lot more than actually I have seen of the lakes and I really looking forward to taking the girls to the boat trip tomorrow to visit some of these places. I think they will really like it. #00:15:29-6#

Interviewer: Do you think VR might change your future travel behaviour to this place? #00:15:34-1#

P17: We will explore more now after we have seen that these places, we want to explore more than probably we would have planned to. #00:15:51-2#

Interviewer: The VR experience encourage you to go Grasmere? #00:15:56-5#

P17: Yes, it encouraged me to go to Grasmere. #00:15:57-8#

Interviewer: What exactly made you to go there? #00:15:57-8#

P16: You expect it to be beautiful but then we you actually see it like that, and you say yes, it is really nice, you know in your head you will not get disappointed. It guarantees see your thoughts. Seeing the lakes so close to the little Village, I think the kids will really see it. I just would like to see it tomorrow. #00:16:34-5#

Interviewer: Would you like to add something, comments?? #00:16:37-2#

P16: I think I will get much more into VR now, it was fantastic. I am very impressed.

Interview with P6 and P7:

Interviewer: Tell me something about your last/current visit here to the LD? #00:00:06-8#

P6: We have been here since Saturday, just staying here for the weekend. We are coming from Birmingham. This is our first time here in Windermere/Bowness, we have been to Helm Crag and Grasmere the other day... #00:00:35-6#

Interviewer: Is it your first time here in LD? #00:00:35-6#

P6: No, the second. P7: For me the same #00:00:31-3#

Interviewer: What do you do here usually in the Lake District? #00:00:45-3#

Person 6: Climbing #00:00:50-6#

Interviewer: What meaning has this place for you? #00:00:51-4#

P6: Just to escape from real life and being in the nature. P7: Just to be relaxed after the week. Just walking and exercising and more healthy life style #00:01:05-3#

Interviewer: What makes this place special to you? #00:01:08-9#

P6: ...? better places, the scenery, the people, everything, and to relax most of all. P7: It is the same, the scenery really. #00:01:28-0#

Interviewer: What do you like from the Scenery? #00:01:28-0#

P6: It is totally untouched and it is just all green and you can just see from miles. P7: The lack of settlements and stuff like that. #00:01:37-3#

Interviewer: How would you describe your feelings to this place? #00:01:39-0#

P6: For me it is the best place in the country and whenever I come here it always relaxes me and I feel always a lot better being here. P7: The same for me, it is just relaxing. #00:01:56-6#

Interviewer: Do you have any childhood memories? #00:02:02-8#

P6 and P7: Both say no. #00:02:02-8#

Interviewer: P6 and P7 having their VR experience #00:09:49-5#

P6: It was interesting, it was surreal. I have not been here. ... #00:10:06-2#

Interviewer: How would you describe your VR experience? #00:10:07-1#

P6: A good experience. I would rather like to be in person still. But it was still good see everything there. P7: It is probably good for people who cannot come to the Lake District themselves and have a look at VR #00:10:38-2#

Interviewer: What did you like seeing from the birds-eye view? #00:10:40-7#

P7: It gives you a different perspective, a different view outlook. You can probably see more from the air then you probably on the roads. P6: It was good to see 360-degree all the way around so you could see in every way and every direction. #00:10:58-1#

Interviewer: Have you seen anything particular that you have not seen before? #00:11:01-4#

P7: Not really, but it gives you a different view. P6: The only place we have not seen was Tarn Hows and that is the only we have not been before and it was good to see what it looks like. #00:11:16-1#

Interviewer: Do you know more places here at the Lake District? #00:11:25-5#

P6 and P7: Both say yes except tarn hows. #00:11:33-4#

Interviewer: Did the VR evoke any memories? #00:11:33-4#

P6: Yes, Grasmere for instance, I was looking for the gingerbread shop, because that is my favourite place in Grasmere and Grasmere is one of the best places in Lake District, so it is nice to see it from the birds-eye view. P7: I was also trying to recognise all, stuff like that. #00:11:50-9#

Interviewer: What did you like the most seeing from BEV? #00:11:51-8#

P6: It was just good to see the places you actually walk, see it quit up is not stuff like that, like the Honister and lake and put it in perspective. P7: Yeah, it gives you a different perspective. #00:12:09-1#

Interviewer: What do you think about the surroundings of LD VR? #00:12:22-0#

P6: This one is ... to me, I mean the noises that you could hear add to the realism of it. P7: The same. #00:12:37-5#

Interviewer: Because you know Grasmere, is there any difference? #00:12:37-5#

P6: There is no difference other that you can see it from the birds-eye view. I would rather being in Grasmere myself and walking around than seeing from birds-eye view. P7: Unless you are actually up there looking from birds-eye view. As I said it is good for people who can't come to Lake District: P6: People who are not mobile and so on. P7: Also, educational reasons. P6: It helps also if you do not know where you want to go in the Lake District. It helps giving you a clear view of the known places and where you would like to go. #00:13:15-6#

Interviewer: Did VR change your relationship to the place? #00:13:16-4#

P7: Not particularly, it gives me a different perspective. I can see the advantage of using it but obviously nothing is better than being there in real life. P6: I agree, it has not change my relationship to the place. I already got a positive one but as Andy said, someone who has never been here or educational reasons it is a good benefit. #00:13:48-1#

Interviewer: Do you think it enhances it? #00:13:53-0#

P6 and P7: Yeah, it does it with the sounds and the BEV, definitely (both agree). #00:14:02-6#

Interviewer: Tell me about your feelings after your VR exp? #00:14:08-8#

P6: The same as I had in person, still love the place and it is still my favourite place in the country and it was just nice seeing it from BEV. P7: The same for me, feelings. If you live in the city, it is nice to come here out and where it is more open and a lot more views. There is so much different things to see. #00:14:32-5#

Interviewer: VR impact future travel behaviours? #00:14:37-8#

Person: P6: Possibly abroad, not in this country because the places are accessible, and you already have a clear understanding where you going and what you do. But when you abroad, you are paying so much money, you want to know what you are getting into ..?things. Potentially yes. #00:14:53-0#

Interviewer: Would it be the same for you seeing things in VR instead of being there? #00:14:57-2#

Person: P6: Not for me, I want to be fully embraced in the place. But it is good to see it from the BEV. P7: The same. It would be better for someone who has not been to the LD themselves. But if you have been there yourself than you rather see.. coming here instead of looking on VR. #00:15:28-0#

Interviewer: Add comments? #00:15:33-4#

Person: P6: It is interesting to see from a different perspective. It will help a lot of people. P7: I reckon to be a good educational wise or cannot access the LD themselves.

Interview with P12:

Interviewer: Tell me about your trip here in the Lake District? #00:00:00-0#

P12: We just here for the day because my son and his family, which come up occasionally and we like to take them to the lakes? #00:00:20-5#

Interviewer: What do you do here usually the Lakes? #00:00:22-7#

P12: We go for walk and have some lunch. #00:00:33-7#

Interviewer: How often have u been here at the Lake District? #00:00:36-9# P12: Hundreds and hundreds of time. #00:00:38-2#

Interviewer: Have u been here as a child? Do you have any childhood memories? #00:00:40-8#

P12: Yes. #00:00:37-4#

Interviewer: What kind of memories? #00:00:41-7#

P12: At primary school we used to spend a week here and do a lot of weeks and this made me to fall in love with the lakes and my wife as well when I brought her here. #00:01:00-8#

Interviewer: What meaning has this place for you? #00:01:00-8#

P12: As a ... as it could be, considering the crowds today, the scenery , there are more dramatic sceneries in other parts of the world but it has a uniqueness that other places does not have. It is also a feeling of being home, since we come here for so many years. #00:01:48-4#

Interviewer: What has changed compare to the past? #00:01:56-4#

P12: It seems to be a lot busier then, as I said I have been coming here for 50 years on and off, it seems to be down and now it seems to be getting very popular again. I like to that, the motorway has been closed and I thought it might be quiet. It is very busy, I think the weather has something to do with it. #00:02:18-1#

Interviewer: How would u describe your feelings to this place? #00:02:19-2#

P12: I love it, it is like a second home, really. We lived in London for 30 years, but we always made a point to come here every year. Because ... It is an addiction, you don't loose ... #00:02:47-9#

Interviewer: Have u been to all places here in LD? #00:02:54-0#

P12: Yeah, most of them. #00:02:56-1#

Interviewer: How would u describe your VR experience? #00:06:49-1#

P12: It will never be the real thing, it is nice idea being able to look all over everything as supposed to stand at the bottom of the valley, just like being a little ant. It was Honister... the older you get the less likely you climb up all the other things or to persuade other people to go up with you. It is an opportunity to go up to these places without actually doing it, because you know from past experience, it will never be the same as the real experience, but it is a good substitute. #00:07:39-3#

Interviewer: Have you been to all of these place? #00:07:44-8#

P12: I am not sure about Honister pass. #00:07:50-3#

Interviewer: Did VR it bring memories back? #00:07:50-3#

P12: It did yes, you were able to ...? I recognise that and I recognises that. Particular like Buttermere you know which I know quite well. It was nice to be able to saw it from a boat really, being able to see all around and actually looking over it ... particular valley. #00:08:16-9#

Interviewer: What did u like the most? #00:08:20-6#

P12: It was at the lake and being able to look all around as you were in a boat in the middle of the lake because you get a different perspective as far ... concern. I mean like, you know can look like at... but if you go on a boat you see completely differently. So, you know, if you come to ...ground on the boat or something, then you can experience that. I have ... about it? #00:08:51-3#

Interviewer: How did u perceive the lake in the VE? #00:08:57-6#

P12: I just say, it was almost as good as the real thing. I imagine, I have never sailed on Buttermere, I cannot give a definite comparison but it certain gave the impression. I was able to be there even though I have never been there in the middle of Buttermere. Experience, that I ,...? or I was not been able to do. #00:09:30-9#

Interviewer: Have u picked up anything particularly? #00:09:32-0#

P12: How do you mean? #00:09:44-1#

Interviewer: Anything new you have seen which you have missed before? #00:09:48-2#

P12: I never sailed on Buttermere, it was like going on a boat in Butteremere instead of just walking around and also be able to see the mountains as well if you wanted to. #00:10:04-6#

Interviewer: Did VR changed your view or relationship to the place? #00:10:07-8#

P12: No, but if you have not been to the Lake District. I am sure, it would. I mean, you can look at the photographs and you know it will not give the right impression. If you go on holiday you can get the guidebook and you can see all these pictures, but it is not the same as actually being there and actually look 360 degree. We went to Florence and we looked the picture but instead you stand there and can't actually look around and see where it is in relation to everything else. You don't get the real thing whereas if you been able to see the VR thing beforehand, you would get a better idea what this place is all about and if it is somewhere you would like to go but you never be and you might not be able to go it might be a substitute for be able to do it. You can travel without actually travelling. #00:11:18-5#

Interviewer: Tell me about your feelings after the VR ? #00:11:29-7#

P12: Seen it from a different perspective, I noticed it is a drone. I saw a bit of Tarn Hows that I have never seen before, because you can walk through the woods and see the Tarn but you never be able to look over it and get a better perspective what it is all about. So you get a better perspective, you are going to miss things by going around. #00:12:03-7#

Interviewer: Do you think VR might changes your future travel to this place? #00:12:14-4#

P12: It will not change it. I will always come here and I have certain impressions of it but it is a nice addition.... I had a one of these where we just have been it can give you a better perspective on where you have been. We have been for a walk and we have on tracks and I think we went wrong from there as well. Being able to see Tarn Hows, you can look at the map, and you can see the picture afterwards, it would be great all these ways on the map if you could as well look from high and follow the map before you go on the walk. You go with a better confidence. #00:13:07-2#

Interviewer: It never substitute experience? #00:13:19-1#

P12: Because I will always come here. It would be a good substitute... I always wanted to go Japan, whether I will go or not, but it would be nice to get the feel of Japan by looking at something like this. #00:13:32-0#

Interviewer: Would you like to add something, comments? #00:13:35-6#

P12: It is certain in the future, it could take all the holidays. You can never substitute the real thing, but it is a good second.

Interview with P7:

Interviewer: Tell me something last about your last/current visit to the LD? #00:00:08-5#

P7: It was quite a long time ago, I was probably, actually it was not long ago, I came for a little trip about a year ago. It was nice and we had a day here and I really loved it. I love the lakes I love the scenic views, it is absolutely breath taking, there is nowhere like it. I went to wales thinking that might be like the lake district and it was not. I just faint? it, I love it. Just so much to do, so much to see, if you pick a nice day in the summer it is beautiful. I have never been in the winter, but I have many friends that come in the winter and walk their walks/dogs? and everything. I wish I would fit enough and well to that but unfortunately, I have got many replacements? and love to claims these mountains. But I am not able to do that, you know. I am too old for that. Just having a lovely time and be here a couple of days. #00:01:18-6#

Interviewer: What do you do here usually? #00:01:20-2#

P7: It is just a holiday break, you know for a couple of days, nice weather, your partner likes the sights we have a couple of days here. I really love the lakes; it is a place I would probably want to come back to it from time to time again. I don't really have been abroad quite a lot in my lifetime and to be honest travelling to far, now when I am getting older and things that come along with it does not appeal with it.? I think I would much rather stay local within a short drive. The people are nice and friendly, lovely places to shop, strange little shops, nice little cafes, very pleasant very nice people, staying in a lovely Airbnb which we really like. This is as much as I can really say. #00:02:22-1#

Interviewer: What kind of activities do you do here? #00:02:23-4#

P7: Not a lot really because we both got disabilities and we come for relaxing a couple of days. I wish I would be younger were I could do all these sports. Honestly, ...? we have got all disabilities...? Sit down. I like watching the boats, there is a lot of things to do without having to go too far away. #00:03:14-9#

Interviewer: Do u have any childhood memories? #00:03:17-2#

P7: Yes, I do. Because I used to go to Alston with my dad. I was very young and at that there was not much around there were no shops or anything. It was just a ... a sort of general ideas. You know it was back in, I am 64 years, so I am going back about 54 years ago, and I was about 9 or 10. There was nothing here but fields and with my father used to walk through this field and it was a farmer fields. It had no trespasses but we used to go through. There were 5 children, and we used to have a picnic down the stream at Alston and it took me there on many occasions. I can remember just thinking it was nice seeing it but I was very young at that time. This were my first memories of the lakes. I have tried Wales, but nothing is nice as here and I went to Snowdonia to the top, this was nice but nothing like the views of the scenery here. #00:04:32-7#

Interviewer: What meaning has this place for you? #00:04:36-8#

P7: I think it is just a lovely place, just a nice place to be. It is just, I suppose it does really ...? for my childhood but I always liked when I was younger. But I just think I love the scenery, that is the mean. #00:05:01-6#

Interviewer: What is the most scenery you like? #00:05:08-9#

P7: I love all the mountains; I wish I could climb on the top of them. I do. Something I always wanted to do, I wish I would be young again, where I can do all these lovely walks all these experiences. Definitely a place where I will come back to from time and time again. #00:05:30-0#

Interviewer: Feelings to this place. #00:05:30-7#

P7: Happy, happy, happy, nice, awesome, it is awesome place. A little bit of nostalgia from the past. I think this is everything I can really say about it. I do really like it and there are lovely different places to go. All the different lakes. Kendell, Cassack etc. it was a time ago......But it is a place where I would like to return to. #00:06:34-4#

Interviewer: How would you describe your VR experience? #00:07:47-4#

P7: O wow, that is great. Fab. O my goodness, so many places to explore. Wow, fantastic, Honister pass, wow, the people normally walk? or do they go with the car to the Honister pass? Absolutely beautiful. Gorgeous. Stunning, beautiful, Grasmere, the

gras is so green, breath taking, takes my breath away, gorgeous, lovely. Have u taken all these videos? Beautiful, is it taking from a helicopter? A drone. Gosh, you can lose yourself here. It is beautiful. That is fantastic, I absolutely loved it. Stunning, absolutely stunning. #00:11:07-3#

Interviewer: What did you like the most? #00:11:10-0#

P7: I think of all the places I liked Buttermere because the mountains and the colour was absolute awesome. #00:11:23-2#

Interviewer: How did u perceive them? The mountains etc.? #00:11:23-2#

P7: It looks very isolated, I think I would be a little bit worried of..? and really new? It looks quite isolated in some parks. But lovely, beautiful, breath taking. #00:11:52-6#

Interviewer: How did u like the representation of the LD from BEV? #00:11:52-6#

Person: it was really good, awesome. It was really nice. #00:12:02-2#

Interviewer: What did you like seeing the place from a different perspective? #00:11:59-8#

Person: I liked to see close up all the things I have not been able to see while I have been here, obviously. If I did go you see it from down below, so it is nice to look down to something, because I was thinking a helicopter ride does something where you can actually go there and see things better. Because you always just see them from here and you don't always take in.., and see it from height is lovely. It is really nice. #00:12:34-3#

Interviewer: Do you know all these places ? #00:12:37-8#

P7: No I have not been to all places. I probably might be to all when I was a kid but I really do not remember. #00:12:52-6#

Interviewer: Are any memories coming back? #00:12:54-3#

P7: Just of the mountains and everything, just that and the forestry, birds and wild life. #00:13:06-7#

Interviewer: What do you think about the surroundings of Lake District in VR? #00:13:10-8#

P7: I think the surroundings look very nice. Really awesome. #00:13:26-4#

Interviewer: In the VR? #00:13:29-2#

P7: Yes. I just thought it looked really treat of life? And really nice, #00:13:41-8#

Interviewer: How do you compare VR and Real? #00:13:47-3#

P7: Yes, you can see it much better and much clearer with the VR. It is much better. #00:14:03-7#

Interviewer: It is much clearer in VR? #00:14:04-9#

P7: Yes, I think so. When you see that, you can look down and far??? it seems so clear and so much better, it just looks amazing. #00:14:17-9#

Interviewer: Did u pick up anything particular? #00:14:19-2#

P7: Just the lovely colours in the mountains and Buttermere, it was so outstanding. I felt like I wanted to paint a picture. It was so gorgeous. I don't know what to say. It was lovely and so nice. #00:15:06-1#

Interviewer: Do you think the VR has changed your view or relationship to this place? #00:15:08-3#

P7: No, I always love it, but seeing it in a VR, is really ... I think it really made that thing how much nicer than I even thought it was to be honest. And all seeing things up closer or I have not seen, I really would like to go and visit, should I get the change in the future. #00:15:31-4#

Interviewer: Tell me about feelings after the VR experience? #00:15:40-8#

P7: Happy, happy, nice, content. #00:15:53-6#

Interviewer: Will VR impact your future travel behaviour? #00:16:05-6#

P7: Possibly not. I think I would just have to really, if I were going to places that seemed a little bit more distant I would have really do navigation first and make sure that we do

not get lost. That is my priority because my partner is not very good in driving and he is always getting lost. #00:16:31-3#

Interviewer: Would you use VR to have a look before you go there? #00:16:37-6# P7: Yes, possibly yes. Definitely. #00:16:45-8#

Interviewer: When you said you can't walk up to the mountains. Did it satisfy you in VR? #00:16:52-4#

P7: For people with possibilities, it would be harder, I don't know what you could suggest. If this little thing could be set up. I really dont know. I could not climb up because I a have disabilities and I walk and your partner has disabilities as well. I don't think the things could be set up along the way. It seems quite remote. #00:17:49-2#

Interviewer: Would you use VR to climb up the mountain? #00:17:54-7#

P7: Yeah, it would be a nice thing to do. #00:17:56-4#

Interviewer: Was it your first VR experience? #00:17:57-6#

P7: Yes, it was. It is really nice to think if you could just to that, were you set up something and where you can have a little look and pretend that you are doing it even though you cannot do it. This would be really nice. #00:18:01-6#

Interviewer: Would you like to add or comment anything? #00:18:12-7#

P7: No. Why do we have to go abroad when we have such lovely places here. The only thing is the weather.

Interview with P10:

Interviewer: Tell me about your visits in Lake District? #00:00:00-0# P10: We are here caravanning, we are here for the five days period , we are going back home on Sunday. This is our third visit this year, it has been an extremely pleasant experience because the weather is exceptionally good. #00:00:24-3#

Interviewer: What do you like here the most? #00:00:31-7# **P10**: The tranquillity, the peace, the people. It is lovely to talk to, you can talk to all people of the world. #00:00:36-1#

Interviewer: What meaning has this place for you? #00:00:38-2#

P10: My wife asked me that many times, I have gone back into my history and my grandfather originated from Cumbria Westermill land. That is the only thing I can put it down to it. We love coming back to Westernmill (Cumbria) it is a pleasant experience. If you want you can have a little bit of shopping, if you want solitude you can walk around the lake, the quietness, the peacefulness. It is just somewhere we love coming to. #00:01:10-1#

Interviewer: Where are u from? #00:01:10-1# P10: Dyrham, which is on the east coast. #00:01:33-4#

Interviewer: How would you describe your feelings towards this place? #00:01:40-7# P10: Tranquil, it is nice to come up to meet people from all over the world and find out that the biggest majority of people are really friendly. Kind to put it as simple as that. #00:02:10-7#

Interviewer: P10 has his VR experience---- #00:02:20-9# P10: You are above the trees. #00:07:55-0#

Interviewer: How did u like it? #00:07:54-7#

P10: Good, it was brilliant. Really good. #00:08:04-6#

Interviewer: How would you describe your VR experience? #00:08:04-6#

P10: I am trying to think as an older person of an old generation. Yes, it is interesting, the first time you see it because it is a view of the Lake District that you rarely get. I would think the older generation once you get this on the head... it is too big, too bulky, you are sweating sort of thing. I might say the future is for younger generation, they will get the feeling for like flying above the Lake District. It is good, I think it is really good. #00:08:46-7#

Interviewer: What did you like the most? #00:08:51-5#

P10: It took me back to the hang glider days. When I was above everything and looking down. Honister pass, that was a good view of that one. I still say the older generation will, oh yes, it is really good to look at but because of the bulkiness of the headset I think it once and that is sufficient? I am fully intended to buy one of those. #00:09:37-4#

Interviewer: Do you know all these places? #00:10:31-5# P10: Yes, I have been to all of them. #00:10:31-5#

Interviewer: What did you like seeing the place from a different perspective? #00:10:58-6#

P10: That was bringing back old memories, above the trees, off the hill tops, that was my view when. I was running off the top with the hang glider and looked down above the countryside. In fact, it was such close to tree tops I had the old feeling again you down to law? you needed to be looking for a clay spot to land with the hang glider. #00:11:24-8#

Interviewer: How long did you do hang gliding? #00:11:28-2# P10: 50 years, I was not anymore fit enough, the wife used to say get rid of that hang glider. #00:11:42-9#

Interviewer: Did VR the gives you the same feeling? #00:11:47-7# P10: Yes, it does. It brings you back. First time you have that feelings, it brings it back. I thought it did. ... I really enjoyed it. #00:12:09-2# **Interviewer**: How did you perceive the surroundings of the Lake District in VR? #00:12:09-2#

P10: When you already have been there, your memories bring it back. That is way I was looking behind me above certain views thinking yes, it is, they have got everything, they have 360 degree. You can teach someone hang gliding. (Laughing) Brilliant. #00:12:43-4#

Interviewer: What is the biggest difference between VR and the real? #00:12:44-6# P10: It does not capture everything that the real environment captures. The sight, the sounds, the smells of the real environment you enjoy different. Personally, when u come to hang gliding fear comes into it as well. But there was no fear. #00:13:06-2#

Interviewer: Has VR has changed your relationship to this place? #00:13:12-1# P10: No, it does not change my relationship. I love and have enjoyed seeing those panoramic views, but I still like to explore the lake district for myself personally. Like I said, the sights, the sounds, the smells I don't think VR can cope with that sort of thing. Yes, if someone is sitting in the hospital bed, that could not move it could be bring memories for people. Only good things can come out. #00:13:40-7#

Interviewer: Tell me about your feelings after your VR experience? #00:13:40-7# P10: I would say there is any difference because I have seen and touched most of those experience for real. The VR is just, as soon as the video starts to play, u think for yourself, yes, I have been there. On that hill side run, passed the road, that is why you are turning around and look 360 degrees. I don't think it has changed me, my view on the lake district, I don't think you can beat the original, the real-life view. I don't VR can ever take over the real view, the real sight of the lake district. #00:14:37-5#

Interviewer: When said it brought old memories back, did it evoke any memories? #00:14:41-7#

P10: I did not feel the fear (laughing). When I was flying the hang glider I was always aware of my height and if I got down to low, I had to look for somewhere to land to a clear field. So, they were times the drone was taking you quite low to the tree tops, my worry was to look for somewhere to land, the old ideas came back again to look somewhere to land again. I really enjoyed it. #00:15:16-8#

Interviewer: Do you think VR might change your future travel behaviour? #00:15:20-8#

P10: It mere as VR progresses, I think it is quite wild to glore? to be as clearest as what I am looking at now. Obviously, it can't compete with the reality of actually being there. I will take a VR of swimming in the lake. What is the difference of actually swimming in the lake and watching the VR? The sights, the sounds, the feelings. VR will never ever all those feelings back to real life. I don't think so, I might be wrong. You can't beat real life. Otherwise, yes, I am sure there is a lot of people enjoying that view, bringing a lot of memories back to them. Yes. #00:16:22-1#

Interviewer: Would you like to add anything or any comments? #00:16:25-1# P10: That is all. Brilliant. I really enjoyed that.





1. Aesthetics

- Grasmere looks so much better in VR then, what it is
- Just the lovely colours in the mountains and Buttermere, it was so outstanding.
 I felt like I wanted to paint a picture. It was so gorgeous. I don't know what to say. It was lovely and so nice
- Just the beautiful brightness and the lushness of the forest? and the colours.
- It was pretty cool and a beautiful scenery
- Just the fields, I love the fields because I like camping.
- It is very green, lovely, it is just tranquil, it is very peaceful the lakes.
- I like seeing the lakes, because I have not seen them like that before, I have never seen Grasmere that way before
- Beautiful, beautiful, very contrast and stuff like that. the greenery from the mountains
- It looks quite isolated in some parks. But lovely, beautiful, breath taking.
- Beautiful. Absolutely

- I thought it was great, it was fantastic. It looks very beautiful. Man: It looks like exactly like it should
- As beautiful as it is
- The LD truly different, it is a national park, it is definitely. It is beauty.
- Yes it did. I thought I knew most of it until you watched that. I did not know there were more beatiful places.
- I think it is just consolidated or reinforced my view about the lushness and the beautifulness of the location. If anything, it is, it is probably enhanced because of the different perspectives
- It was Beautiful
- No but it was nice to see the greener site, when it was all green and it was all pretty and more than the lakes view, I suppose
- wow, that is great. Fab. O my goodness, so many places to explore. Wow, fantastic, honister pass, wow, the people normally walk? or do they go with the car to the honister pass? Absolutely beautiful. Gorgeous. Stunning, beautiful, Grasmere, the gras is so green, breath taking, takes my breath away, gorgeous, lovely

2. Atmosphere

- it is just tranquil; it is very peaceful the lakes.
- Make them a bit more peaceful
- I suppose that way it used to be seen the sceneries all of the time. It was nice to see. I know they were walkers and I know there were a few cows and images. It was just quiet and peaceful. It was nice
- I think the surroundings look very nice. Really awesome
- It is quite realistic I think because it shows all the different, I dont know what are the big things about the LD, for me if it is sunny you get all the kinds of greens and you got all of those in the VR. It does not make things uniform coloury, just picks everything out
- The scenery, i mean ...walked or whatever you know. Cold shower rain or sunshine, so I am protected .. looking at. i have been on that path, it is very good.

- I think of all the places I liked Buttermere because the mountains and the colour was absolute awesome
- Again, it is just the scenery. I love the scenery, I think you have captured the scenery very nicely
- The lake itself and the scenery. Fantastic. See it so close, it so nice.
- It is different, I did not expect this, I thought I would see the what I see here. I did not know how much greenery it was and how beautiful it is. It is astonishing.
- It gives you different views that you would not see otherwhise. I suppose also, because it is not very good weather here, at least you could see the views where quite a lot of the time you can't
- Yeah, i think it made me to appreciate more, liked more. I have not seen it from above
- It is maybe a greater appreciation of the beauty of the place
- There is definitive a greater appreciation, but we have such an affection for the lakes anyway
- No, I always love it, but seeing it in a VR, is really ...???? I think it really made that thing how much nicer than I even thought it was to be honest.
- I would say more, ... it could have took on a few more other shots around places and be happy to sit here and watch them as well. It was enjoyable, as I said, we talked about ... enjoying things like that, it is mindfulness, taking things in and appreciating it, it adds on to it
- But I just appreciate what I have seen from above
- You expect it to be beautiful but then we you actually see it like that and you say yes, it is really nice, you know in your head you will not get disappointed. It guarantees see your thoughts. Seeing the lakes so close to the little Village, i think the kids will really see it. I just would like to see it tomorrow
- Hence, all the birds noise in the background adds to its experience
- It was good. It was really good. The music was also nice having the music in the background.
- i mean the noises that you could hear add to the realism of it
- I suppose, it was really nice to have the audio as well, you could feel being there and listen to the environment
- Yeah, it does it with the sounds and the BEV, definitely

3. Accessibility

- I think it is very good for people who can't come to the lakes. For whatever reasons. We had this discussion earlier actually. I was just saying that it is a shame that there is not more facilities for disabled people in this area. You have to be able to walk to be able to enjoy the experience fully. That is perfect for someone who is not able-bodied. Both agree and say it is very good. ...it is obviously you cannot outdoor facilities like this not be able that everyone can access to it
- So it is an opportunity for them to enjoy something like that. It is a really good idea.
- It is probably good for people who cannot come to the LD themselves and have a look at the VR
- It could be good for people with autism.
- But the application serves best for persons who are not able to access the facilities here at the lakes
- P3: Especially the touristy kind of sights like (hotbells?) like windermere, the mere and walks around here. Especially Buttermere, such a lovely area but it is just not accessible for people who have disabilites, so something like that would be really good who is not able-bodied.
- the older you get the less likely you climb up all the other things or to persuade other people to go up with you. It is an oppurtunity to go up to these place without actually doing it, because you know from past experience, it will never be the same as the real experience but it is a good substitute
- Just seeing everything, because like I said sometimes you cant go everywhere.
 So, that is really good to see everything
- I liked to see close up all the things I have not been able to see while I have been here, obviously.
- It has not a profund experience on me but it gave me a new perspective on it.
 I like seeing places I might not going to visit like Buttermere. We dont time. It was nice to see.
- P21 Person: Because how you have seen everything. If you cant visit everything in one go that would be a good way to the rest of it if you dont have much time.
- I would like to go but you have to drive there. I had the opportunity to drive there once, but I did not want to drive. It goes 25- 30 gradient and I did not want to

drive a car manual there and none of the buses go there. I visited all the other passes where the bus goes to but this is one where the bus do not go there.

- It will offer some substitution we can't get the chair up there and I can't walk there, it offers that kind of substitution.
- No, probably not, it looked like the other passes and not so nice like the other passes. I went pinreth? and it is a nicer pass. The Honister pass is a old? quarry area, it does not look so attractive to me as the other pass I went yesterday.
- because I was thinking a helicopter ride does something where you can actually go there and see things
- I just say, it was almost as good as the real thing
- I had it in the water, i could see water and fishes it quite hard to see. Usually in this way it is actually the same really, anyway you are going to be able to see views like that like you are in a helicopter
- Completely different. I know a lot of people who cannot afford to come here and stuff like that. Virtual tourism is a good way to experience something like than actually traveling to it for many reasons, it could actually change the travel tourism industry. Fantastic
- It is not so different as you think it might would be.
- I think it is representing the real environment and looking down it gives it a beautiful perspective
- There is no difference other that you can see it from the BEV
- I suppose you don't really. It was just being able to look all around, you are not
- No, but if you have not been to the LD. I am sure, it would. I mean, you can look at the photographs and you know it will not give the right impression. If you go on holiday you can get the guidebook and you can see all these pictures, but it is not the same as actually being there and actually look 360 degree. We went to Florence and we looked the picture but instead you stand there and can't actually look around and see where it is in relation to everything else. You don't get the real thing whereas if you been able to see the VR thing beforehand, you would get a better idea what this place is all about and if it is somewhere you would like to go
- i suppose. I think if you are not yourself in the LD it is nice to actually have that and and you can see it and kind of to pretend to be there for a while. If you had

not been here before, I would say definitely it gives you a real feel for what it is like

- I mean you use this as a tourist tool. You want to come here to see for yourself
- I dont think so, we live here. As I said we could use it on visit centres or on boat trips for tourists if they do not have the opportunities to go and look at all the places
- If they had more videos and more places within the lakes we have not actually explored before and you get a sneak peek of it how it might look like. That would be fun and also other places around the country
- Possibly abroad, not in this country because the places are accessible and you already have a clear understanding where you going and what you do. But when you abroad, you are paying so much money, you want to know what you are getting into ..things
- I had a one of these where we just have been it can give u a better perspective on where you have been. We have been for a walk and we have on tracks and I think we went wrong from there as well. Being able to see tarn hows, you can look at the map, and you can see the picture afterwards, it would be great all these ways on the map if you could as well look from high and follow the map before u go on the walk. You go with a better confidence
- VR is a similar experience, to a range of places and you can't decide where you want to go. Then you can go through the VR experience to different places
- I can see how some might want to see in a different way before they went for instance, having a street view of the area. But it is ...content to see it from a BEV, it is incredible
- The same. It would be better for someone who has not been to the LD themselves. But if you have been there yourself than you rather see.. coming here instead of looking on VR.
- Because I will always come here. It would be a good substitute... I always wanted to go Japan, whether I will go or not but it would be nice to get the feel of Japan by looking at something like this
- But now I really want to take them there, after seeing it so, we take them (kids) to Grasmere now.
- I think it is good because I may want to go that places now. P1 (confirming) yeah, it is a fair point

- And all seeing things up closer or I have not seen, I really would like to go and visit, should I get the change in the future.
- Yes, because we will go now and see Grasmere now, definitely
- The place looks really nice and I want to go to visit all the places in the VR. I have been more to the main. Looking at them makes me want to come back next time
- I suppose because we have seen a much bigger area in VR, it is kind of made me think o wow, actually it made me just go further? to field ? and see a bit more, come back again and to see something else. Man: Exploring further the field. Otherwise,...? how..? being reminded what it is like.
- It makes you to want to go to these places P1 and P2 agree with that.
- I would visit buttermere anyway but it kind of
- make me to want to see grasmere, it looks quite nice
- I think there are a couple of places there where I have not been to and I think it possibly I would like to actually investigate those places in future, like tarn hows, I have never heard about it before (P3 also confirms that she never heard about it), but it would be nice to see
- Yes, it would. Looking at that, I want to come back. We have done a pit stop here because of my child. And I would like to come back and see Grasmere
- Yes, it encourages me to go to Grasmere.
- Yes, I would not say no. It is quite relaxing and tranquil.
- Yes, tarn hows but it did not look what I thought it was supposed to be. So, this is one area I would like to look up and see where it is and walking there.
- Yes, based on the VR experience I just had
- Absolutely, I would give Honister pass a miss but I would definitely look up Tarn hows.

4. Presence

- they will get the feeling for like flying above the lake district.
- Obvisouly, things we could see looking down and we did fly over trees and the lake, Buttermre.
- I am scared of height, some of the ideas when you are rising up, actually I felt like I was there when I was rising, very bizarre

- Yes, I felt like I was there and it intimidated me a bit but for the rest I felt quit safe. I did feel like being there the entire way watching the audio. Everything you move your head around, you moving the camera and everything is going with? It was brilliant.
- I felt like I was flying, it was the view of the lake
- When I was above everything and looking down. Honister pass, that was a good view of that one
- It was at the lake and being able to look all around as you were in a boat in the middle of the lake because you get a different perspective
- In fact it was such close to tree tops I had the old feeling again you down to law? you needed to be looking for a clay? spot to land with the hang glider.
- It is like just I have been seeing it from here.
- I never sailed on Buttermere, it was like going on a boat in butteremere instead of just walking around and also be able to see the mountains as well if you wanted to.
- You feel like to be on a helicopter and looking down, this is the best way to describe it. On the ground level you can not see so much but that looks fantastic, you are feeling like watching it all.
- it is like flying away from the ground
- It was like being in a helicopter like having BVE of what every looks like, seeing things you never really looked at, beeing able to look up and and down and around. It was good.
- You like down and you are realising you are flying in the air.
- I imagine, I have never sailed on buttermere, I cannot give a definite comparison but it certain gave the impression. I was able to be there even though I have never been there in the middle of Buttermere
- Actually when you are in it, you do really think you are there. It was more realistic than I thought it was going to be
- Yes, it does. It brings you back. First time you have that feelings, it brings it back. I thought it did. I have.....other stuff not related. I really enjoyed it.

5. Memories

- It gave me memories when I last came because that little village with the grasfields where we were staying with my group from school. I remember we went out and did ...tours, we were like sneaking out
- I like Buttermere, i think because I was doing much fellrun, it was based on buttermere and grasmere all that area. So one of my favourite places.
- I would not say anything specific, it.. tarn how, grasmere being up there.
- Good, it was brilliant. Really good. #00:08:04-6# P10 Person: It took me back to the hang glider days.
- It was really nice. It was excellent. It brought back memories where we have been and visited. We went to Grasmere the other day and stayed also there.
- Grasmere, we have been to all of them at different times.
- That was bringing back old memories, above the trees, off the hill tops, that was my view when I was running off the top with the hang glider and looked down above the countryside
- I was looking and I was thinking yes, we have been here and it was very lovely and it is very well done
- When you already have been there, your memories bring it back. That is way I
 was looking behind me above certain views thinking yes, it is, they have got
 everything, they have 360 degrees
- Yes, it brought back memories, it is like seeing a picture, i dont have any pictures of that time. It brought back my memories
- I was driving the van up and down the litte roards and I could not remember all cleary. It was terrying. Tarn hows too
- I think I am going to remember this and I will have another story to tell and a different appreciation of it
- We found alternatives that we have enjoyed but seeing VR as well is kind of
 pretty nice to get that perspective because I know I can't get up to myself. It is
 nice to be able to have at least the memories and what the view is like. And it is
 nice that chris gets to see that because he does not go on his own. He stayed
 down. It nice to remember and think about things what we did do and enjoy it
 again.
- For the person who has been here it is reminding of things rather than substituting, o yes we have done this, but for someone who has never been

here , oh that looks pretty, whereas, for us we have done this oh yes, it is very nice it remind us of how we had the moon over the walk.

- I was thinking about the family walks we used to have in tarn hows, i was going them through again as we mentioned driving the van through honister
- Yes it did. As I said, it is a part where I walked down before where I have been before like and and different perspective on that part
- Yes, Grasmere for instance, I was looking for the ginger bread shop, because that is my favourite place in Grasmere and Grasmere is one of the best places in LD, so it is nice to see it from the BEV
- I was also trying to recognise all, stuff like that
- I did not feel the fear (laughing). When I was flying the hangglider I was always aware of my height and if I got down to low, I had to look for somewhere to land to a clear field. So, the were times the drone was taking you quite low to the tree tops, my worry was to look for somewhere to land, the old ideas came back again to look somewhere to land again. I really enjoyed it
- Just of the mountains and everything, just that and the forestry, birds and wild life
- Yes, that was really cool. I remember going through roads and feeling sick in the big van.
- Some of Grasmere, it showed lot more than actually I have seen of the lakes and I really looking forward to take the girls to the boat trip tomorrow to visit some of these place. I think they will really like it
- Just thinking about the different walks and what we did there and see different things. And where we stayed, oh yes, we looked down this road did this, we went up there, we have seen the house before? etc. It was nice to see all these things in sun.
- That is absolutely-- Butterermere, very nice. Beautiful, I have fond memories of it. Grasmere, we have been yesterday to Grasmere

6. Increased Place Knowledge

• I think Tarn Hows we did not see much of it. The town we have seen a lot more than the forest, which I am not particular familiar with it. So, it is quite nice to see it in a different way I suppose.

- The only place we have not seen was tarn hows and that is the only we have not been before and it was good to see what it looks like
- I have never seen Grasmere like that, I have been to the village but I have never realised how close it is to the lake side and the rest of it
- The houses and stuff, there are a lot of fields which I did not know
- You get a better persepctive where you have been and what you have seen.
- It was just good to see the places you actually walk, see it quit up is not stuff like that, like the honister and lake and put it in perspective
- It helps also if you do not know where you want to go in the LD. It helps giving you a clear view of the known places and where you would like to go
- Seen it from a different perspective, i noticed it is a drone. I saw a bit of tarn hows that I have never seen before, because you can walk through the woods and see the tarn but you never be able to look over it and get a better perspective what it is all about. So you get a better perspective, you are going to miss things by going around.
- I know more about the place now.
- It depends where and how it could be used. It you were in a ...big city quite possible. I might use something to know more or to see more about or learn about it.
- if I were go to places that seemed a little bit more distant I would have really do navigation first and make sure that we do not get lost. That is my priority because my partner is not very good in driving and he is always getting lost
- Yes, you can see it much better and much clearer with the VR. It is much better.
- When you see that, you can look down and far??? it seems so clear and so much better, it just looks amazing.
- Both agree, you can see everything as it is. You can see more than in reality because of you are in the air and you are above the trees.
- It looks greener in the VR than it does in reality
- From that perspective it is so much more real than seeing it on a photo because you cannot get all these different colours. More distinction
- The VE looks much better because it is all sunny.
- It was interesting, different perspective from above and look around and looking things and landscape from eye of the bird you can say
- I prefer the more greenery the first view. It was interesting to be able to look around and see everything.
- Yes, it is interesting, the first time you see it because it is a view of the LD that you rarely get
- it is nice idea being able to look all over everything as suppose to stand at the bottom of the valley, just like being a litte ant. It was honister..
- I have been to Grasmere before obvisouly, but I have never seen it like this before. It is just amazing and just to see a view like that you would never see unless you are actually flying
- What I liked about it, where was a different perspective to what I have seen on the ground, so I am looking down and it looks quite different to what it looks like
- Not as expected, I was expecting something to this world? but it was more of a depth view? you could see great details
- I love see it from a different perspective obviously from a drone, which is quite different what you see from the ground. So, it is quite different and interesting.
- I was, because I suffer from vertigo and dizzyness, I thought it will be a bit more problematic than it was. It was good for that perspective.
- but looking from above it is interesting
- Yeah, I thought it was good. I thought some of the places it was little bit better than it was I think I made several comments about tarn hows. You have to forgive me
- I liked it, it let me see the lakes in a view I have not seen before
- I think for me, because I am the driver, I have never noticed certain features.
 So, I was able to see them from a different perspective as well. We have driven to honister pass once before and it is fast and high you dont notices everything.
 So it was nice to see from a different angle, so you get an idea where everything is.
- It gave me an interested view.. it could be good if you have different seasons or/all times, so like it is raining, snowing, frosty
- Beatiful, it really shows it from its best angle
- It gives you also various views as well, you have picked different spots that really showing all different aspects of
- Very good. You see more just sit sitting there. It brings you closer

- It was quite different, it was good, it gives you a different perspective what is great
- Not really, but it gives you a different view
- Just being able to have the opportunity to have the 360-degree view of a particular place. It was good.
- It is the idea of actually seeing it from above, which you don't actually see it until you clime up the mountain but you still don't travel when you on top of the mountain, thats that, that is the view you get.
- Like you said, from the BEV you can so much
- Just seeing the scenery to be honest, it is a view like,
- You get a better of view of, so you have done a walk and you have seen the park but it gives you the whole perspective and not just an individual snapshots.
 You get a better persepctive where you have been and what you have seen.
- Yeah, it gives you a different perspective
- Because you always just see them from here and you dont always take in.., and see it from height is lovely. It is really nice
- I can imagine some people would comment that it waters it. You know saying through technology, but I think it is really positive way of seeing things in a different way
- it was very nice, it was a really nice experience to see that. Something we could not see
- I think it is enhanced looking down, you are getting a better context, therefore I like climbing to? because looking down is different to be on the ground level. This was really good.
- Yeah, I suppose so, in a sense, because you have seen it in a different way
- Not, but we would come back anyway regardless, but it was just nice to see a different sort of view,
- Yeah, it was really good so far. It is a good avenue to sell, to people to see the LD in a different way.
- That was very nice, it was comfortable ...? because we are familiar with the area but we have not seen it from this perspective

- it just replaces when you can't get the whole perspective necessarily, you don't get it from the ground and you can't see the whole 360 degree view even on the top of the hills? So, somewhere like that to get the overall perspectives, it is nice
- It is so beautiful, some of the places I don't have even heard of.

Appendix 5 - Questionnaire Variables

Place Identity	Measurement	Adopted from
PI_1	I identify strongly with Lake District National Park	Yuksel et al. (2010);
PI_2	I feel like this place is a part of me	Chen et al. (2014);
PI_3	I feel Lake District National Park is a part of me	Ramkissoon et al.
		(2014)
Place Dependence		
PD_1	For the activities that I enjoyed must, the settings	Yuksel et al. (2010);
	and facilities provided by Lake District National	Chen et al. (2014);
	Park are the best	Ramkissoon et al.
PD_2	For what I like to do, I could not imagine anything	(2014)
	better than the settings and the facilities provided	
	by Lake District National Park	
PD_3	I enjoy visiting Lake District National Park and its	
	environment more than any other destination	
Social Bonding		
Social_1	If I were to leave Lake District National Park I	Chen et al. (2014);
	would be lose contact with a number of friends	Ramkissoon et al.
Social_2	Many of my friends/family prefer Lake District	(2014)
	National Park over other cities	
Social_3	If I were to stop visiting Lake District National	
	Park, I would lose contact with a number of	
	friends	
Presence		
Presence_1	The virtual environment seemed real to me.	Makransky et al.
Presence_2	I had a sense of acting in the virtual environment,	(2017); Vorderer et
	rather than operating something from outside.	al. (2004); Slater et
Presence_3	My experience in the virtual environment seemed	al. (1994); Slater and
	consistent with my experiences in the real world.	Wilbur (1997)
Presence_4	While I was in the virtual environment, I had a	
	sense of "being there".	
Presence_5	I was completely captivated by the virtual world.	
Memory		
Memory_1	While watching the Lake District in VR I felt as	Correia Loureiro
	though I am reliving it	(2014); Fitzgerald
Memory_2	While watching the Lake District in VR I felt the	and Broadbridge
	same particular emotions I felt at the time of the	(2013); Jorgenson et
	event	al. (2019)

Memory_3	During the VR experience I was reliving my past	
	memories/experience	
Memory_4	During the VR experience I travelled back to the	
	time when it happened	
Memory_5	During the VR experience I had wonderful	
	memories about the Lake District	
Memory_6	The VR experience brought previous	
	memories/experience back of the Lake District	
Aesthetics		
Aesthetics_1	It was very attractive to watch the Lake District in	Kirillova et al. (2014);
	VR	Blijlevens et al.
Aesthetics_2	It was very beautiful to watch the LD in VR	(2017) and from
Aesthetics_3	I appreciate the scenery of the Lake District in VR	participants'
Aesthetics_4	I appreciate the unique landscape of the Lake	responses
	District in VR	
Atmosphere		
Atmosphere_1	The virtual environment of the Lake District is very	Developed from
	colourful	participants'
		responses
Atmosphere_2	The surroundings of the Lake District in VR looked	
	very tranquil	
Atmosphere_3	I perceived the VR environment of the Lake	
	District as relaxing	
Atmosphere_4	I perceived the VR environment of the Lake	
	District as peaceful	
Atmosphere_5	Listening to the sounds in VR was a positive	
	experience	
Accessibility		
Access_1	The VR experience gives me the possibility to	Developed from
	explore distant places within the Lake District	participants'
Access_2	The VR experience allows to access the Lake	responses
	District easily	
Access_3	The VR experience provides a good alternative to	
	access the Lake District where physical travel is	
	not possible (e.g. disability, limited in time, lack of	
	public transportation etc.)	
Access_4	The VR experience provides an alternative travel	
	experience to distant places within the Lake	
	District	

Access_5	The VR experience of the Lake District enables	
	me to interact remotely with this place and	
	provides a sense of travel within the Lake District	
Increased Place		
Knowledge		
Place_Knowledge_1	The VR experience allowed me to gain new	Developed from
	knowledge about the places of the Lake District	participants'
Place_Knowledge_2	I have a better understanding of the different	responses
	areas within the Lake District after using VR	
Place_Knowledge_3	I know more about the places in the Lake District	
	after my VR experience	
Place_Knowledge_4	During the VR experience I have learnt new things	
	about the places in the Lake District	
Place_Knowledge_5	I have gained more knowledge about the	
	landscape details of the Lake District after the VR	
	experience	
Common Method	How interested are you in football?	
Bias		
Increased Place		
Attachment		
	After the VD even arise and identify means at a multi	Develviere en et el
Increased PA_1	After the VR experience I identify more strongly	Ramkissoon et al.
Increased PA_1	with the Lake District	(2014)
Increased PA_1	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more	(2014)
Increased PA_1	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other	(2014)
Increased PA_1	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other destinations	(2014)
Increased PA_1 Increased PA_2 Increased PA_3	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other destinations After the VR experience the Lake District means	(2014)
Increased PA_1 Increased PA_2 Increased PA_3	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other destinations After the VR experience the Lake District means even more to me	(2014)
Increased PA_1 Increased PA_2 Increased PA_3 Increased PA_4	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other destinations After the VR experience the Lake District means even more to me Following the VR experience, I feel even closer	(2014)
Increased PA_1 Increased PA_2 Increased PA_3 Increased PA_4	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other destinations After the VR experience the Lake District means even more to me Following the VR experience, I feel even closer connection with friends and family and/or local	(2014)
Increased PA_1 Increased PA_2 Increased PA_3 Increased PA_4	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other destinations After the VR experience the Lake District means even more to me Following the VR experience, I feel even closer connection with friends and family and/or local residents in the Lake District	(2014)
Increased PA_1 Increased PA_2 Increased PA_3 Increased PA_4 Increased Intention	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other destinations After the VR experience the Lake District means even more to me Following the VR experience, I feel even closer connection with friends and family and/or local residents in the Lake District	(2014)
Increased PA_1 Increased PA_2 Increased PA_3 Increased PA_4 Increased Intention to Revisit	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other destinations After the VR experience the Lake District means even more to me Following the VR experience, I feel even closer connection with friends and family and/or local residents in the Lake District	(2014)
Increased PA_1 Increased PA_2 Increased PA_3 Increased PA_4 Increased Intention to Revisit Increased Intention_1	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other destinations After the VR experience the Lake District means even more to me Following the VR experience, I feel even closer connection with friends and family and/or local residents in the Lake District After the VR experience I am more likely to come	Kamkissoon et al. (2014)
Increased PA_1 Increased PA_2 Increased PA_3 Increased PA_4 Increased Intention to Revisit Increased Intention_1	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other destinations After the VR experience the Lake District means even more to me Following the VR experience, I feel even closer connection with friends and family and/or local residents in the Lake District After the VR experience I am more likely to come back to the Lake District in the future	Kamkissoon et al. (2014) Kim 2018; Stylos et al. 2017
Increased PA_1 Increased PA_2 Increased PA_3 Increased PA_4 Increased Intention to Revisit Increased Intention_1 Increased Intention_2	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other destinations After the VR experience the Lake District means even more to me Following the VR experience, I feel even closer connection with friends and family and/or local residents in the Lake District After the VR experience I am more likely to come back to the Lake District in the future Following the VR experience, I am more likely to	Kamkissoon et al. (2014) Kim 2018; Stylos et al. 2017
Increased PA_1 Increased PA_2 Increased PA_3 Increased PA_4 Increased Intention to Revisit Increased Intention_1 Increased Intention_2	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other destinations After the VR experience the Lake District means even more to me Following the VR experience, I feel even closer connection with friends and family and/or local residents in the Lake District After the VR experience I am more likely to come back to the Lake District in the future Following the VR experience, I am more likely to recommend the Lake District to my friends and	Kamkissoon et al. (2014) Kim 2018; Stylos et al. 2017
Increased PA_1 Increased PA_2 Increased PA_3 Increased PA_4 Increased Intention to Revisit Increased Intention_1 Increased Intention_2	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other destinations After the VR experience the Lake District means even more to me Following the VR experience, I feel even closer connection with friends and family and/or local residents in the Lake District After the VR experience I am more likely to come back to the Lake District in the future Following the VR experience, I am more likely to recommend the Lake District to my friends and others	Kamkissoon et al. (2014) Kim 2018; Stylos et al. 2017
Increased PA_1 Increased PA_2 Increased PA_3 Increased Intention to Revisit Increased Intention_1 Increased Intention_2 Increased Intention_3	After the VR experience I dentify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other destinations After the VR experience the Lake District means even more to me Following the VR experience, I feel even closer connection with friends and family and/or local residents in the Lake District After the VR experience I am more likely to come back to the Lake District in the future Following the VR experience, I am more likely to recommend the Lake District to my friends and others After the VR experience, I want even more to tell	Kamkissoon et al. (2014) Kim 2018; Stylos et al. 2017
Increased PA_1 Increased PA_2 Increased PA_3 Increased PA_4 Increased Intention to Revisit Increased Intention_1 Increased Intention_2 Increased Intention_3	After the VR experience I identify more strongly with the Lake District Following the VR experience I believe more strongly that the Lake District is better than other destinations After the VR experience the Lake District means even more to me Following the VR experience, I feel even closer connection with friends and family and/or local residents in the Lake District After the VR experience I am more likely to come back to the Lake District in the future Following the VR experience, I am more likely to recommend the Lake District to my friends and others After the VR experience, I want even more to tell people positive things about visiting the Lake	Kamkissoon et al. (2014) Kim 2018; Stylos et al. 2017

Increased Intention_4	After the VR experience, I intend to travel to the	
	Lake District more often	
Increased Intention_5	After the VR experience, it is more likely that the	
	Lake District could be the next place I visit	

Appendix 6 - Final Questionnaire

Virtual Reality and Lake District Questionnaire

Dear participant,



My name is Christos Pantelidis and I am a PhD researcher at Manchester Metropolitan University. My research project explores the effect of Virtual reality (VR) of tourists at the Lake District National Park. The aim of this questionnaire is to examine if VR might have an impact on your perception of the Lake District. You have been chosen to take part in this survey as you have previously travelled to the Lake District. Your participation is voluntary, and you can withdraw from the study at any time without any reason. The VR experience takes about 3 minutes and 10 minutes to fulfil the questionnaire. Your information is completely anonymous and will be used only for academic purposes. If you have any questions about this research project, please contact me: christos.pantelidis@stu.mmu.ac.uk Your sincerely.

Christos Pantelidis

Before you commence with the questionnaire, please read the statement below:

I am aware of the risks of using VR and confirm that I do not have any previous medical neurological conditions such as epilepsy, vestibular failure or other seizure driven neurological conditions.

Please tick the box

Signature: _____

Thank you

Please rate your relationship to the Lake District National Park: 1 – Strongly disagree to 7 Strongly agree

1– Strongly disagree – 7- Strongly agree							
I am very attached to the Lake District	1	2	3	4	5	6	7
If I were to stop visiting the Lake District, I would lose contact with a number of friends	1	2	3	4	5	6	7
I identify strongly with the Lake District	1	2	3	4	5	6	7
I feel strong sense of belonging to the Lake District	1	2	3	4	5	6	7
Visiting the Lake District says a lot about who I am	1	2	3	4	5	6	7
The Lake District means a lot to me	1	2	3	4	5	6	7
Many of my friends/family prefer the Lake District over other destinations	1	2	3	4	5	6	7
For what I like to do, I could not imagine anything better than the settings and the facilities provided by the Lake District	1	2	3	4	5	6	7
I feel the Lake District is a part of me	1	2	3	4	5	6	7
My friends/family would be disappointed if I were to stop visiting the Lake District	1	2	3	4	5	6	7

For the activities that I enjoyed must, the settings and facilities provided by the Lake	1	2	3	4	5	6	7
District are the best							
I enjoy visiting the Lake District and its environment more than any other destination	1	2	3	4	5	6	7

Virtual Reality (VR) and Lake District Questionnaire



Please indicate the extent to which you agree with the following statements about today's

VR experience of the Lake District National Park

ĪĒ

1 – Strongly disagree – 7- Strongly agree							
I have gained more knowledge about the landscape details of the Lake District after	1	2	3	4	5	6	7
After the VR experience the Lake District means even more to me	1	2	3	4	5	6	7
The VR experience allowed me to see more details of the Lake District than I would	1	2	3	4	5	6	7
have seen at the ground level							
During the VR experience I travelled back to the time when I was remembering my past	1	2	3	4	5	6	7
visit to this place							
After the VR experience, it is more likely that the Lake District could be the next place	1	2	3	4	5	6	7
I visit							
I perceived the VR environment of the Lake District as peaceful	1	2	3	4	5	6	7
I appreciate the unique landscape of the Lake District in VR	1	2	3	4	5	6	7
After the VR experience I am more likely to come back to the Lake District in the future	1	2	3	4	5	6	7
The VR experience brought previous memories/experience back of the Lake District	1	2	3	4	5	6	7
After the VR experience, I want even more to tell people positive things about visiting	1	2	3	4	5	6	7
the Lake District							
During the VR experience I have learnt new things about the places in the Lake District	1	2	3	4	5	6	7
I appreciate the scenery of the Lake District in VR	1	2	3	4	5	6	7
Following the VR experience, I am more likely to recommend the Lake District to my	1	2	3	4	5	6	7
friends and others							
The VR experience provides a good alternative to access the Lake District where	1	2	3	4	5	6	7
physical travel is not possible (e.g. disability, limited in time, lack of public							
transportation etc.)							
Listening to the sounds in VR was a positive experience	1	2	3	4	5	6	7
The VR experience gave me a unique view of the Lake District	1	2	3	4	5	6	7
While I was in the virtual environment, I had a sense of "being there".	1	2	3	4	5	6	7
The VR experience allowed me to gain new knowledge about the places of the Lake	1	2	3	4	5	6	7
District							
The VR experience allows to access the Lake District easily	1	2	3	4	5	6	7

The 360 Degree representation of the Lake District in VR gave me the possibility to see	1	2	3	4	5	6	7
more than I would see usually							
The surroundings of the Lake District in VR looked very tranquil	1	2	3	4	5	6	7
After the VR experience I identify more strongly with the Lake District	1	2	3	4	5	6	7
It was very attractive to watch the Lake District in VR	1	2	3	4	5	6	7
I was completely captivated by the virtual world.	1	2	3	4	5	6	7
The 'bird's eye view' provided a unique angle which I have not seen the Lake District	1	2	3	4	5	6	7
before							
While watching the Lake District in VR I felt the same particular emotions I felt at the	1	2	3	4	5	6	7
time of the event							
The virtual environment of the Lake District is very colourful	1	2	3	4	5	6	7
The virtual environment seemed real to me.	1	2	3	4	5	6	7
The VR experience made me realise that the areas around the places in the Lake	1	2	3	4	5	6	7
District are bigger than I thought							
During the VR experience I had wonderful memories about the Lake District	1	2	3	4	5	6	7
1 – Strongly disagree – 7- Strongly agree							
I had a sense of acting in the virtual environment, rather than operating something	1	2	3	4	5	6	7
from outside.							
It was very beautiful to watch the Lake District in VR	1	2	3	4	5	6	7
While watching the Lake District in VR I felt as though I am reliving it	1	2	3	4	5	6	7
During the VR experience I was reliving my past memories/experience	1	2	3	4	5	6	7
I know more about the places in the Lake District after my VR experience	1	2	3	4	5	6	7
The VR experience of the Lake District enables me to interact remotely with this place	1	2	3	4	5	6	7
and provides a sense of travel within the Lake District							
Following the VR experience, I feel even closer connection with friends and family	1	2	3	4	5	6	7
and/or local residents in the Lake District							
I perceived the VR environment of the Lake District as relaxing	1	2	3	4	5	6	7
My experience in the virtual environment seemed consistent with my experiences in	1	2	3	4	5	6	7
the real world.							
The VR allowed me to experience a new perspective of the Lake District	1	2	3	4	5	6	7
How interested are you in football?	1	2	3	4	5	6	7
The VR experience gives me the possibility to explore distant places within the Lake	1	2	3	4	5	6	7
District							
The VR experience provides an alternative travel experience to distant places within	1	2	3	4	5	6	7
the Lake District							

Following the VR experience I believe more strongly that the Lake District is better	1	2	3	4	5	6	7
than other destinations							
After the VR experience, I intend to travel to the Lake District more often	1	2	3	4	5	6	7
I have a better understanding of the different areas within the Lake District after using	1	2	3	4	5	6	7
VR							

Please evaluate your level of previous VR experience

1 Very	2 Moderately	3 Slightly	4 Neutral	5 Slightly	6 Moderately	7 Very
inexperienced	inexperienced	inexperienced		experienced	experienced	experienced
1	2	3	4	5	6	7

How often do you visit the Lake District on average?

Weekly	Monthly	Between 1 and 3 months	Between 3 and 6 months	Between 6 and 12 months	More than 1 year

Who do you usually come to the Lake District with?

Partner	Friends	Other	lf	other,	please
Family	Solo		spe	cify:	

Please indicate your gender

Male	Female	Other	

Year of birth:	Postal Code	

Thank you very much for your participation.