Looking through their eyes: A case study and SWOT analysis of participant-driven videography to inform park research and management

by

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Abstract

Participant-driven videography (PDV) may be a useful tool in park and protected areas (PPA) research. PDV consists of participants employing a camera to record videos about a subject or experience, giving the participant control over what sites are documented and their narration of in situ experience. Given the limited application of PDV to PPA research, this study demonstrates 1) the application of PDV in a multi-case study to explore its' utility for a qualitative understanding of stakeholder perspectives of visitor experiences, and 2) recommendations for future application of PDV in PPA research. PDV interviews were conducted with a remote video conferencing application with knowledgeable park stakeholders at two NPS units: Rock Creek Park and Chesapeake & Ohio Canal National Historical Park, where the researcher asked stakeholders to conduct a "virtual tour" while identifying areas and attributes of importance. Stakeholders were chosen based on their in-depth knowledge about past and present aspects of the park, experiences which would inform their ideas around future direction. Analysis includes a priori coding of videos and transcripts to highlight variables of importance. SWOT analysis of PDV includes exploring strengths, weaknesses, opportunities, and threats of applying PDV, in this adapted remote environment, to PPA research. Results indicate a wide array of variables past, present, and future that influence visitor experiences, and that PDV offers more strengths than weaknesses in its application, thus we conclude that PDV is a useful tool for gaining rich qualitative insights about PPA 's above and beyond more common qualitative approaches.

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Dedication

This thesis is dedicated to all the other students, no matter what level or grade, whose academic experiences have been as altered as mine for the past nearly two years. May you all find the spirit and will to persevere forward.

Chapter 1 - Introduction

Visitation to National Park Service (NPS) units reached 327 million people in 2019, and this number continues to grow as increasingly more individuals partake in outdoor recreation in public lands (NPS, 2021a). To manage the millions of people visiting the NPS, multiple federal land agencies apply the Interagency Visitor Use Management Framework (IVUMF) to guide visitor use management decisions (Interagency Visitor Use Management Council, 2016). The IVUMF consists of 4 key steps including (1) Build the foundation, (2) Define visitor use management action, (3) Identify management strategies, and (4) Implement, monitor, and adjust. These steps can use social science research to successfully manage public lands both for resource protection and providing a desirable visitor experience. In this research, we apply the IVUMF to understand variables important to the user experience based on the in-depth knowledge of park stakeholders.

The overarching research project is focused on visitor-use research in the National Capitol Area (NCA). The NCA research collaborative involves nine park units managed by the NPS in Washington D.C., Virginia, West Virginia, and Maryland, including: Chesapeake and Ohio Canal National Historical Park, Greenbelt Park, Harpers Ferry National Historical Park, Manassas National Battlefield, Monocacy National Battlefield, Potomac Heritage National Scenic Trail, Prince William Forest Park, Rock Creek Park, and Wolf Trap National Park for the Performing Arts. Various social science methods are employed at these places to gather information that can help park managers understand the visitors at these places, and to better manage amenities, facilities, and services to enhance the visitor experience.

The two sites that we focused on for this specific study include Rock Creek Park (ROCR) and Chesapeake & Ohio Canal National Historical Park (CHOH). We chose these parks due to

their rich histories, variety of visitor activities and experiences, and managerial need to better understand current uses and preferences related to experiences in these parks. Applying innovative social science research methods here allow us to explore this objective.

Rock Creek Park is an urban park located in Washington D.C. that spans 1,700+ acres across U.S. reservation 339 and 99 tributary parks such as Dumbarton Oaks Park, Meridian Hill Park, and seven fort circle parks that were once used in the defense of Washington D.C. during the Civil War, to name a few. ROCR is an oasis with thick forests, winding valleys, and endless recreation opportunities, despite neighboring urban development. There are also opportunities for public and school programming, viewing historic structures, musical performances, in addition to traditional recreation activities like hiking, biking, and picnicking. Because of the complex variables that influence the visitor experience at ROCR, managers are particularly interested in current and desired visitor experiences, as well as how to better engage external partnership efforts to strengthen future planning and management of the park.

The other study site, CHOH is a linear 184.5-mile-long park that begins in Washington D.C. and follows the Potomac River on the Maryland side into Cumberland, Maryland. In the 18th century it was known exclusively as the C&O Canal: a working canal that served as a mode of transportation and westward expansion for nearly 80 years. The towpath that follows the Canal once had mules pulling Canal boats, and since 1971 it has been known as a National Historical Park filled with recreation opportunities. Multiple Canal Towns such as a Williamsport, VA, Brunswick, VA, and Cumberland, MD, use the Canal as a source of tourism and economic drive. This is partially due to the fact the Canal is considered a bucket list item for cyclists because of its connection to the Great Allegheny Passage (GAP) Trail, allowing cyclists to bike from Pittsburg to Washington D.C. CHOH celebrates its 50th anniversary as a NPS park

in 2021, thus park managers wish to understand what the visitor experiences are in order to productively manage the park for future visitors.

To investigate the management needs, we employed participant-driven videography (PDV) as an innovative, participatory, qualitative method. This method consists of participants using a camera to record their lived experiences or share visuals about a certain context, and then the videos are transcribed, coded, and analyzed to extract key themes about a particular study subject. For the purpose of this project, the participants include recruited knowledgeable stakeholders at both ROCR and CHOH who completed "virtual walking tours" at specific sites within either ROCR or CHOH to showcase variables relating to the visitor experience. PDV allows for

rich, detailed, context that may not otherwise be captured, nor even considered when using other methods of qualitative or quantitative research. It does however relate to video ethnographies since ethnographies in PPAs seek to understand deep cultural relationships that people have with a place. This study is not an ethnography since we are not dedicating a significant amount of time to understanding a cultural relationship, rather we use an adapted method – participant-drive videography – that allows for rich qualitative contexts within the timeframe of management needs.

In addition to using remote PDV for visitor use management in the NCA, this study is also interested in the applicability of using remote PDV for future PPA studies using social science methods. We conduct an analysis of strengths, weaknesses, opportunities, and threats, known as a SWOT analysis to investigate the internal and external factors of this method, and as a result we provide recommendations for researchers and park managers. As PPA research

increasingly utilizes participatory studies and as new technologies emerge for conducting remote research, we posit that PDV may be a useful tool in future research and management.

Chapter 2 - Manuscript

Introduction

Cameras have been used to capture social science data across disciplines over the past 20 years (Little et al., 2020). Within recent decades- with the proliferation of new technologies- camera usage in research increased internationally particularly within environmental conservation social sciences, (21% of identified studies), engineering and technology (15% of identified studies), agriculture (11% of identified studies), and computer science and programming (10% of identified studies) (Little et al., 2020). Cameras are additionally used in a variety of real-world contexts such as in 3D technology in healthcare (Bostelman et al., 2006), law enforcement with body-cameras for police officers, (Jennings et al., 2014), and infrared cameras in science classrooms (Haglund et al., 2016).

Within the application of cameras in research, videography has emerged as a widespread application. Videography is defined as the 'interpretive analysis of gathered video data in the context of an ethnographic collection process' (Knoblauch et al., 2014, p. 19) and it allows for footage of real-life activities and experiences to be documented seamlessly and used as data itself (Mackenzie & Kerr, 2012). Video footage aids in participants recalling memories of specific events or activities and detailing how the participants experienced them (Mackenzie & Kerr, 2012; Brown, 2015a; Brown & Spinney, 2010) and captures meaning of spatial and temporal movement in ways that photo and text formats cannot due to their limited capabilities (Brown & Spinney, 2010).

Moreover, some studies administer video ethnographies in understanding deeper contextual relationships and context that can be captured on video (Laurier et al., 2004). Within the National Park Service (NPS), ethnographies have increased in application since 1981 in order

to understand and document previously ignored surrounding communities or cultures within or near a PPA (Ruppert, 2009). As a result, we adapt ethnographic methods to a park management focus, such as learning more about visitor recreation preferences.

We use PDV as our adapted method since PDV has been identified as a subset of videography methods that allows the participant to control the camera and choose what to record (Brown et al., 2008), giving the power to the participants by allowing them to tell their own story (Smith & Dunkley, 2018). Real time dialogue recorded by videos has potential to provide additional meaning and context beyond the capabilities of photographs, such as sound and motion in the surrounding landscape and with other individuals (McClain & Zimmerman, 2016; McClain, 2018). Moreover, post-videography discussion with researchers and participants allows for the recorded video data to act as a prompt that the participant further elaborate upon the meaning expressed in the video (Brown et al., 2008).

Past studies identified PDV as a useful tool in collecting qualitative data. However, PDV as a method in parks and protected areas (PPA) research is underutilized. Zajchowski et al. (2020) published a systematic review that identified only nine studies that used videography and video footage in PPA research, and these studies all used videography differently. Zajchowski et al. (2020) posits that video data produces clear footage of reality that can be captured to visualize the visitor experience. This would be a useful method to harness and implement further into PPA research, but currently there is no clear systematic method guiding the application of videography to PPA research.

This study builds upon the scant literature in PPA research using PDV. The systematic review conducted by Zajchowski et al. (2020) aids in identifying potential guidance for applying videography methods in the PPA discipline by exploring the utility of PDV. Utility, in this case,

is defined as the ability to provide beneficial use of the method to inform park planning and management. To do so, this research uses PDV data from a recent study at Chesapeake and Ohio Canal National Historical Park (CHOH) and Rock Creek Park (ROCR) to further investigate variables important to the recreation experience through the perspective of park stakeholders. Therefore, the objectives of this thesis are to 1) apply PDV remotely in a multi-case study to explore how the method helps to gain a rich understanding of park experiences and 2) provide recommendations for the application of PDV in parks and protected areas research. Due to the timeline of this thesis, broader research project, and the Covid-19 pandemic limiting on-site travel and data collection, the videography application was adapted to be applied remotely. Therefore, this thesis focuses specifically on PDV applications in remote contexts – considered to be a useful adaptation given recent global challenges and potential future changes related to financial and environmental limitations that may inhibit future travel. The remote application is also worth exploring when studying trail networks. The spatial extent of trails can make it difficult to reach all stakeholders in person, as they span states. Remote PDV may help PPA managers reach stakeholders across a broad social extent. For these reasons and others, the overarching goal of this research is to outline the process, results, and findings of adapting and applying PDV remotely to provide the discipline with clear guidance regarding how and why to apply PDV across a range of PPA management decisions.

Literature Review

Visitor Use Management Variables

We seek to understand desired visitor experiences by understanding the social, natural, and managerial variables of two PPAs. These three variables are known to both impact, and be impacted by visitors, and are therefore serve as important components of park management and decision making (Manning, 2011). The success of a PPA is credited to the functioning and collaboration of social, natural, and managerial variables – each of which impacts the visitor experience (Manning, 2011). According to Miller et al. (2017), social variables include people and their respective activities and behaviors, natural variables include wildlife, and water and earth features, and managerial variables include park regulations, facilities, and services offered. Management-by-objectives frameworks, including the most recent Interagency Visitor Use Management Framework (IVUMF), involve a formulation of objectives and associated indicators of quality (Lime & Stankey, 1971, Manning, 2007) that can be managed and measured as proxies for progress towards management objectives (Manning, 2011). To identify indicators and associated levels of acceptable impact, PPA users are often asked to evaluate levels of potential impacts caused to the social, natural, or managerial landscape by outdoor recreation. For instance, visitors or other park stakeholders may be asked to evaluate the impacts related to the increasing number of visitors to a site (e.g., social), the increasing erosion in a riparian area (e.g., natural), or the availability of services and facilities along a hiking route (e.g., managerial). Those variables that are important and impactful to the visitor experience (e.g., indicators) aid in visitor use management since it informs how people make decisions about what activities to participate in, locations to visit, and when and how to engage in them.

As a result, we use PDV to understand desired user experiences that can inform indicator development. These experiences aid in moving closer to recognizing important variables that directly impact the visitors within a PPA, which may later inform PPA managers and assist them in meeting management objectives. Park stakeholders, the sample population for this study, are considered invested and knowledgeable about the resource within a PPA and consequently are well qualified to identify social, natural, and managerial variables that are impactful to the user experience over time and that may aid in achieving management objectives.

Past PPA Research Methods

Past studies have measured visitor experiences and preferences starting with the later decades of the 20th century where explanatory studies incorporating social theories grew extensively, as did research regarding recreation and leisure going beyond the descriptive. Individualistic characteristics advanced in recognition and qualitative information became a valuable tool to gain insights into outdoor recreation experiences (Manning, 2011). Past quantitative PPA research employed questionnaires as the most common method. For example, Alazaizeh et al. (2016) administered a three-part questionnaire to visitors to measure the importance of heritage tourism in their trip motivations, how they value preservation values and use of heritage sites, and preference towards management actions at Petra Archaeological Park, Jordan in order to effectively and sustainably manage the site. Over time, qualitative inquiry became more common not only as an exploratory research method, but also out of critical theorists seeking answers to important questions about the power structures that drive society, including the role of PPAs and the sometimes unbalanced power dynamic between PPA managers and communities most impacted by management decisions. As such, the value of participatory research gained traction (Bergold & Thomas, 2012). Participatory research consists

of direct participant involvement in the data collection process through fostering collaboration with researchers (Bitsura-Meszaros et al., 2019; Johnson et al., 2004). More commonly in PPA research, participatory approaches are used in mapping different PPA topics such as ecosystem services (Klain & Chan, 2012), urban park benefits (Brown et al., 2018), and perceived social values of outdoor recreationists (van Riper et al., 2012). Yet, the wholesale application of participatory methods using other instruments (i.e., videography) in PPA research is still very much underutilized and under studied.

Participant-Driven Videography (PDV)

PDV stems from the application of photography in research where participants use a camera to take photos of a research subject, theme, or location (Balomeou & Garrod, 2016; Mackay & Couldwell, 2004). Photos allow for contextualizing a landscape (Gou & Shibata, 2017), and communicating the perceived image of a particular destination (Mackay & Couldwell, 2004). However, because photos are only one-dimensional, and reality is not one-dimensional, moving beyond photographs and into videos allow for the multi-dimensionality of life to be experienced, recorded, and analyzed (Brown et al., 2008).

Given the context specific nature of PPA experiences and research, videography is well-suited to address management challenges but is yet to be fully realized. Zajchowski et al. (2020) conducted a systematic review of PDV in PPA literature, and they identified only nine relevant articles (Brown, 2015a; Brown, 2015b; Brown et al., 2008; Brown & Spinney, 2010; McClain & Zimmerman, 2016; McClain, 2018; Petheram et al., 2011; Smith & Dunkley, 2018; Smith et al., 2019). Within these selected studies, videography in PPA research was identified as a key tool in capturing verbal and non-verbal interactions with the environment and between others. Videography also allows for in-depth examination of human and nonhuman relationships in

specific landscapes (Brown, 2015b). Through videography, the meaning of experiences and activities can be captured and analyzed (Brown et al., 2008) in a way that static images cannot, thus adding a deeper level of dimensionality. Moreover, videography can be combined with transect walks to gain rich information about certain contexts experienced while walking (Battista & Manaugh, 2017). Walking methods can be considered a participatory design due to their ability to gain deep insights from the participants (Kanstrupp et al., 2014; Battista & Manaugh et al., 2017). For example, Battista & Manaugh (2017) video recorded a walking interview, combined with post-hoc sedentary interviews to understand the held perceptions of the surrounding environment the participants experience while walking. Videography captures movement and surrounding content by utilizing qualitative footage, thus bolstering the data collection process by providing enriching visual and audio data.

Characteristics of PDV

Previous studies employing PDV are generally characterized by several shared characteristics. First, studies applying this method recruit a small number of participants (Brown, 2015a; Brown, 2015b; Smith et al., 2019). Second, sometimes the researcher stays alongside the participants during the videography process (Brown, 2015a) but other times the participants were unattended (Smith et al., 2019). Some studies explored the utility of specific technologies, such as headcams, in understanding how people experience landscapes, (Brown et al, 2008) and other studies used the recorded footage to prompt further discussion with the participants (Brown, 2015a; Brown, 2015b; Brown & Spinney, 2010; Brown et al., 2008).

Benefits of PDV include 1) providing visual examples of the subject of interest (Brown, 2015a, Brown, 2015b), 2) capturing highly mobile subjects, such as cyclists (Brown & Spinney, 2010), and 3) allowing for new meanings to be found within the video, such as how people

engage with the surrounding landscape (Brown et al., 2008). As mentioned previously, an important benefit of PDV is 4) that it can be used to reduce power imbalances by giving the participants control over what is shown on video (Brown et al., 2008). Various technologies record videos from participants including headcams (Brown & Spinney, 2010; Brown et al., 2008) mobile technologies (McClain & Zimmerman, 2016; McClain, 2018), and on-body chest harnesses (Smith et al., 2019). After video capture, analysis of PDV can include thematic analysis (Brown 2015b; McClain & Zimmerman, 2016; McClain 2018), line by line coding of transcribed video data where audio and image can be captured and included in the transcript (McClain, 2018), and using qualitative analysis software such as Nvivo 12 (Brown et al., 2008). Zajchowski et al.'s (2020) systematic review lays the foundational context for further pursuing the investigation of PDV in PPA research by applying it in a specific PPA and conducting analyses on guidance for future use.

Ethnographic Techniques and Pragmatism

The application of video data in this study is further explored as a quasi-video ethnographic technique. Traditionally, an ethnography seeks to understand a social phenomenon in its natural context using multiple data sources (i.e., conversations and observations) (Hammersley, 2016). Knoblauch et al. (2014) defines videography an ethnographic technique where videography is the term for connecting video analysis and ethnography for an interpretive analysis. Nassauer & Legewie (2021) identified ethnography as a 'prominent methodological forbearer' (p. 138) to video data analysis, as ethnographies aim to explore complex social contexts and situations. Past studies have used video ethnographic techniques to fulfill hypotheses. For example, Brown implemented ethnographic methods in their past research to 1) explore cyclists' movement and challenges with using mobile video data (Brown & Spinney,

2009). 2) examine movement and impacts of walkers and mountain bikers recreating in a national park (Brown 2015a), 3) how dogs and humans use the landscape (Brown 2015b), and 4) how headcams can be used in combination with mobile and cycle-based ethnographies (Brown, Dilley, & Marshall, 2008). Moreover, Smith & Dunkley (2018) and Smith et al. (2019) used ethnomethodology in their exploration of how children use the landscape and how adult groups traverse an open landscape, respectively.

Within a NPS focus, the Park Service conducts ethnographies in PPAs to understand group-specific cultures, histories, and preferences (i.e., Native Americans) within NPS units (NPS, 2021b). These ethnographies traditionally employ constructivist paradigms since they obtain value from rich information of people, communities, or cultures (Ryan, 2017) by using multiple realities and subjective views from the participants. However, this research study is based in pragmatism as it is focused on the outcomes of the research for real world application (Creswell, 2013). According to Creswell (2013), qualities of a pragmatist approach include the researchers choosing and applying methods they see fit to meet their research purpose. This study utilizes a pragmatist approach due to the focus being on understanding what constitutes a quality visitor experience by adapting existing PDV methods to be remote, rather than focusing on using a specific method to reach a specific conclusion. Therefore, while we are not directly conducting an ethnography due to the practical time frame of our research for managerial needs and academic purposes, the data collection process through the multi-case study is informed by video ethnographic techniques that allows us to investigate the utility of our videography method in a deep-seated manner across divergent settings, activities, and user types for park planning and visitor use management.

Methods

Multi-Case Study

This study uses PDV and a multi-case study informed by mobile and video ethnographic methods, as well as an analytic approach driven visitor experience variables to explore the utility of PDV as a research and management tool in PPAs. Multi-case study allows us to explore the real-life experience in an in-depth manner, since many experiences are context dependent (Yin, 2014). In case studies, extensive, descriptive questions can be asked to gain insight about a research topic that is bound by time or location (Creswell et al., 2007), as case studies seek to examine the meaning of a particular case (i.e., park unit) (Babbie, 2017). Using a multi-case study allows for multiple holistic designs that are replicated (Yin, 2009) to be compared, which provides profound details regarding a specific issue or topic- such as the variables that constitute a quality visitor experience at ROCR and CHOH.

Site Descriptions

We applied PDV at two NPS sites: Rock Creek Park (ROCR) and Chesapeake and Ohio Canal National Historical Park (CHOH). ROCR was established in 1890 as the third site under management of the NPS. The park has an elaborate history that has shaped what it is today, including farms, mills, and involvement in the Civil War Defense of Washington D.C. Located in the U.S. capital, its primary section encompasses 1,754 acres and 99 extensions of the park include various tributary parks, traffic circle parks, fort circle parks, memorials, and statues. In 2020, ROCR reported 1,768,152 annual visits (NPS, 2021c), which was lower than usual due the pandemic. Visitors can participate in a number of activities including hiking, biking, picnicking, visiting the nature center, scenic driving, and experiencing the only active planetarium within the NPS.

The Chesapeake & Ohio Canal began its construction in 1828 and reached its completion in 1850. CHOH is a linear park that stretches for 184.5 miles from Washington D.C. to Cumberland Maryland, and partially into West Virginia along its sinuous route that follows the Potomac River. For nearly 100 years, the Canal acted as a transportation route as mules along the towpath pulled boats full of goods towards western markets. As the utility of the Canal began to die off due to increasing popularity of the railroad, the Canal's use remained stagnant until 1971, when the Canal was established as a National Historical Park, and in 2021 the park celebrates its 50th anniversary as a member of the NPS. In today's time, the towpath has been refurbished into a walking and cycling trail that stretches the 184.5 miles, and many historical Canal Towns rely on visitation to the park to drive their economies. In 2020, CHOH reported 4,888,436 annual visitors (NPS, 2021d); again, this number is lower than average due to the pandemic. Visitors can engage in a multitude of key sites of interest along the way including old lock houses, historic sites, campsites, picnic areas rock climbing, white water opportunities, and seven visitor centers. As a result of the unique activities, settings, and historical context at both ROCR and CHOH, we explore the various variables that contribute to the visitor experience.

Participant Selection

Through a series of on-going conversation with park staff across a multiple-month time frame, representatives from stakeholder groups that hold formal and informal partnerships with one or both of the park units were identified. Stakeholder groups are organizations who hold an interest in a PPA and are affected by the PPA directly. The NPS specifically wanted stakeholder voices to be amplified during this process due to them having existing deep knowledge since their organizations hold major roles in the functionality of the park(s), and further user group recommendations were provided by initial formal participants as needed to capture additional

informal park partners. One of the participants is a representative from a local indigenous tribe, and so while they are not a direct stakeholder, they represent a group of people that have a different and historical relationship with the area, and park management wanted their perspectives shared during this research.

After obtaining our participant list from the NPS, the first invitation was by way of e-mail, with an introductory statement describing the research team, the study, and the methods to be used. Those who agreed to participate received a follow-up phone call to describe the expectations further, and to schedule a time and date to conduct an interview using PDV. Participants were asked to select a location that was representative for them or the organization they represent, as some organizations focused on specific locations within the park unit.

The participants were sorted ahead of time into two groups and received the same questions, but relating to the two different parks. These participants are all representatives from general stakeholder organizations, one from ROCR (Group A) and the other from CHOH (Group B). These groups work to either enhance the visitor experience, fundraise for the park, perform conservation work, etc. Participants from these organizations received questions regarding social, natural, and managerial variables that impact the visitor experience. The questions asked are provided in the appendix as Figure A.1. To ensure participant confidentiality, participating organizations are withheld.

Data Collection: PDV Interviews

While past literature has employed PDV in-person, at the time this study was to be administered on-site in March 2020, the U.S. declared a national emergency due to the Covid-19 pandemic (CNN, 2020). On-site data collection was no longer a possibility due to travel restrictions and the overall threat to the safety and health of both the researchers and participants.

As a result, this study was adapted to be remote by utilizing videoconferencing. Regardless of the remote nature of data collection, humans are still involved in the research and therefore approval from the Internal Review Board (Proposal Number 9881.1) was received (Appendix Figure A.1.

Various studies across disciplines have utilized videoconferencing for qualitative data collection (Archibald et al., 2019; Marhefka et al., 2020). This adaptation also follows past PDV research that justifies using new technologies in ongoing visual methods research (Brown et al., 2008). Zoom was selected as the application to pursue this adapted technique, as it 1) works well for remote data collection in urban areas with reliable cellphone service, 2) can use landscape or selfie mode depending on the purpose of the interview, 3) allows for the meeting to be recorded to facilitate analysis, and 4) meets requirements of PDV through its live, audio and visual elements.

During the scheduled Zoom meeting, the participants flipped the camera on their cellular device to the external camera, showcasing the landscape and providing a visual context of the surrounding area. The researcher then instructed them to walk in their selected site and first give a general insight to the area, serving as an introduction before moving into interview questions and a guided walk by the participant. The researcher employed memoing and journaling to note thoughts about the general data collection process, success and challenges associated with applying the method, and any initial results and patterns that stood out. Memoing is a common method for teasing out results in qualitative research due to the iterative and interactive nature of data collection and analysis (Creswell, 2013).

Three of the participants did not participate in the described PDV interview process due unsteady internet connection or discomfort using the technology. As a result, these participants

were asking to go to their selected site on their own time, and record video(s) of the landscape while narrating responses to the same interview questions as other participants. The researchers do not think the lack of researcher presence to guide the interview altered the data collected, given the multiple interactions with the researcher leading up to their participation, and awareness that their video would be viewed be the researcher during analysis. Opportunities were provided for follow up questions as needed. While these participants all engaged in the alternative plan slightly differently, they were responding to the same set of questions, received the same set of instructions, and drove the conversation and the information they shared, just as live remote interviews did. Therefore, their data is included and can be analyzed as such in combination with the Zoom-led interviews.

Data Analysis: Transcribing and Coding

Data analysis for both objectives includes transcribing the audio collected from the interviews using Audext, a partially automatic transcription service. After transcribing the completed interviews, the transcribed audio and video footage from the recorded interviews were coded using Nvivo 12. Coding consists of analyzing text or visual data by grouping them into smaller categories of similar information, and then labeling those smaller groups in a code (Creswell, 2013). More specifically, first *a-priori* coding is used, which is a deductive analytic strategy that allows for identifying codes that are based on our research questions and guiding theories (Miles et al., 2014). Following that, we used opening coding, an inductive analysis process that consists of carefully perusing each line and word in the transcribed document and seeking out common or dissenting themes, concepts, or patterns (Strauss, 1987, p. 28). Open coding allows us to identify any emergent, unexpected themes from the data. As a result, a-priori

and open coding techniques were applied regarding social, natural, and managerial variables that impact the visitor experience at both CHOH and ROCR as well as during our SWOT analysis.

Video footage was analyzed by applying selected a-priori codes and open codes to capture still frames from the video using screenshotting on Google Drive, thus still maintaining the multi-dimensionality captured in video. Work published by Nassauer & Legewie (2021) serve as a foundation for our video analysis through their presentation of analytical dimensions and procedures associated with video data analysis. The authors note that these dimensions are to provide a lens of understanding the recorded video footage through 'theoretical reflection and employed clear, detailed coding schemes' (p. 138), which we do in this study through our a-priori and open codes. Their dimensions include facial expressions and body posture, interactions (done actions and said words regarding their environment or people in it), and context (information on the physical and social setting of a situation). Because the participants in our method flip the camera to showcase the landscape, we will not be focusing on facial expressions and body posture in our analysis, but rather interactions and context. According to Nassauer & Legewie (2021), the analytic dimension of *interactions* focuses on movement, actions, gestures, and verbal communication to understand situation dynamics. For this study, our analysis of interactions focused on participant interactions with their natural environment (to inform planning) and with the research tool (to inform methodological application). *Context* can be physical, such as the space they are in, or social regarding factors like people present, their relationship(s) with other people or the study subject, and their relevant background information. As a result, our analysis of context was largely focused on participant surroundings in the natural and cultural landscape they described.

SWOT Analysis

SWOT analysis is a qualitative and descriptive method that assesses strengths, weaknesses, opportunities, and threats and has been identified as a useful analysis framework (Helms & Nixon, 2010). Strengths and weaknesses are considered internal factors, and opportunities and threats are external factors to the overall study subject (Gürel & Tat, 2017). SWOT is used extensively in business and marketing (Brooks et al., 2014) but it is not limited to the business realm. PPA literature has applied SWOT analysis in some studies; for example, when assessing ecotourism management (Sayyed et al., 2013), management of protected areas (Rezazadeh et al., 2017), and to identify management strategies for sustainable tourism development (Hossain & Khanal, 2020). Additionally, a systematic review found that SWOT has been used in healthcare, government, and non-profit organizations (Helms & Nixon, 2010). Moreover, it has the potential to be applied in any situation that requires a complex decision-making process due to its ability to reduce and analyze the amount of information provided (Helms & Nixon, 2010). As a result, an additional coding process was conducted based on the SWOT framework to identify strengths, weaknesses, opportunities and threats of using PDV to inform management. We applied the a-priori codes *Strength, Weakness, Opportunity,* and *Threat* to both the interviews and the researcher written memos and journals as a way of organizing data based on SWOT. Following that, we apply open coding to uncover additional themes and patterns. After the initial coding process was complete, we conducted axial coding, which involves regrouping information to look for relationships and patterns amongst the codes themselves (Babbie, 2017). As a result, we were able to create recommendations on how to best apply PDV in future studies.

Data Validation

To ensure trustworthiness of our results, we implemented multiple methods including data triangulation and member checking. Data triangulation is a method where researchers use multiple sources and methods of data to authenticate the results (Creswell, 2013). Our triangulation of data included the video and audio from the interviews, researcher memos, and exploration of multiple cases. Member checking, also called participant or respondent validation, is when the researcher shares the results with the participants to confirm their interpretation and to establish credibility of the findings (Creswell, 2013; Maxwell, 2013). To apply member checking, we sorted our codes with supplementary quotes into larger themes per participant into individual documents. documents were then sent out to the respective participant and they were able to confirm or correct researcher interpretation of their words. An example of the document (Figure A.3) and email (Figure A.4) sent to participants can be found in the appendix. This method provided validation of our findings and allows for credibility to be built.

Results

Descriptives

Before the Covid-19 pandemic, 30 original stakeholder participants given to us from the NPS agreed to conduct PDV interviews in-person and on-site, but because of the remote aspect and limitations imposed by the pandemic, we faced challenges in recruitment. Despite these limitations, we successfully reached 16 participants that provided rich insight. Our total sample includes six participants in Group A (ROCR) and ten in Group B (CHOH) representing the 16 of 30 identified stakeholders who agreed to participate. We recognize that potentially not all the information regarding CHOH and ROCR were captured. The average interview length was 38 minutes, with shortest at 20 minutes, and the longest at 79 minutes. Just over 10 hours of video and audio footage were collected to inform the research questions. Overall, PDV results revealed that respondents were more focused on current managerial variables at ROCR and CHOH rather than social or natural; also at CHOH. An emergent code of "identity" was uncovered at CHOH, and so additional open coding was conducted to investigate what the identity of CHOH is. The SWOT analysis unveiled that there were more strengths than weaknesses, but more threats than opportunities perceived by respondents.

Rock Creek Park Results

Results from the PDV analysis at ROCR suggest that current managerial factors are the most important to the partners of ROCR who discussed concepts such as signage, or lack thereof at ROCR, the opportunity to continue to use Beach Drive for recreation, and how the park is underutilized as a whole. Current natural variables are the second most noted codes from participants with discussion of prominent wildlife, invasive species, and threats of storm water. Current social variables point to factors such as visitor activities and how Covid-19 changed the

visitor experiences. Table 1 displays a frequency table of ROCR codes related to the visitor experiences.

Table 1. Frequency table of visitor experiences at ROCR

Code	Sub-Code	Frequency
Social		
	Past	15
	Current	38
	Future	3
Natural		
	Past	8
	Current	50
	Future	3
Managerial		
	Past	15
	Current	66
	Future	36

Social variables at Rock Creek Park

According to participants, the current social variables at ROCR are most defined by the variety of activities that visitors participate in. Participants 3 and 5 reflect on the community garden within ROCR (Figure 1) saying that *"it sort of gets overlooked. But I will assure you that the users of this thing are very passionate about it"* (Participant 3) and *"they get a lot of use and the people that come to the community garden are here all the time"* (Participant 5). Participant 2 shares, *"You can come in here and there'll be 20 or 30 birdwatchers here looking in the tops of these trees because this is prime bird habitat for migrating birds"*. Figure 2 displays the birding area as provided by Participant 2.

Figure 1. Community garden in ROCR from Participant 3

Figure 2. Popular birding area in ROCR from Participant 2

Figure 3 shows outdoor recreationists at Dumbarton Oaks Park, and Participant 6 shares that visitors engage in a multitude of activities including, *"Walking, running, commuting, educational groups, dog walking, family outings, picnicking. What is it not used for? Outdoor escape rooms, yoga, community-oriented activities. There's painting, photography, bird watching, poetry readings, business meetings, engagement and weddings, family photography sessions"*. Participant 3 describes an open grassy area that is *"used for soccer… and on the weekend people bring lounge chairs or blankets or towels and, they just sunbathe"* (Figure 4).

While participants indicate that ROCR gets a wide variety of use, Participant 3 states that *"I think some of the visitors' behavior, I don't think people realize this is a national park"*. Participants 2 and 3 indicate that *"that's another huge issue in the park… the rules are that you're supposed to have your dogs on a leash, but nobody does"* (Participant 2). This potentially explains issues such as *"people let their dogs off leash, and then they don't pick up their pet waste. And then that's disgusting if you're walking around stepping in it."* (Participant 3).

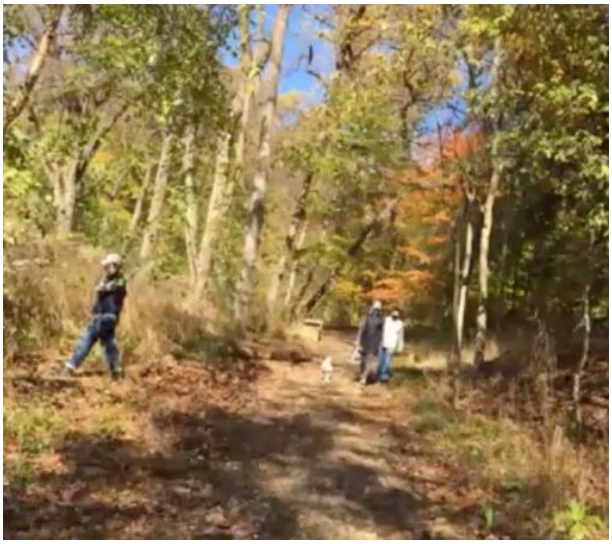

Figure 3. Visitors at Dumbarton Oaks Park from Participant 6

Figure 4. Open grassy area in ROCR from Participant 3

Additionally, Participant 6 came across an off-leash as captured in Figure 5. A major influencing factor related to social variables at ROCR is the Covid-19 pandemic. Participant 6 indicates that programming at Dumbarton Oaks Park has been affected by the pandemic by stating *"we have a robust program there, or had until Covid came around. But we're in the process of adapting those programs to virtual learning".* Additionally, some participants state that Beach Drive, a major commuting route in the park, has been majorly impacted by the pandemic is now an outdoor recreation destination. Participant 4 says, *"There are a lot of people bringing their little kids here currently. There's some people going down the main road pushing*

a stroller. There's no way you could do that if there's car traffic on the road". Figure 6 portrays visitors recreating on Beach Drive, as provided by Participant 4.

Figure 5. Off-leash dog in Dumbarton Oaks Park from Participant 6

Figure 6. Cyclist in ROCR from Participant 4

Natural variables at Rock Creek Park

Participants share a multitude of current natural variables influence the visitor experience at ROCR today. The most frequent code regarding ROCR's natural variables is "prominent wildlife", as mentioned by Participants 2, 3 and 6. Participant 3 describes some of the wildlife in the park, *"There are a few deer in the park ... a lot of wild turkeys…a ton of birds. The park is right on the migratory flyway for the East Coast so birders love it here. There are a lot of species that come through fall and spring"*. The weather plays a significant role in impacting the natural variables at ROCR, as nearly all participants mentioned weather. Participant 4 says *"the hurricane passed through here a couple of days ago"* and shows high water levels in Rock Creek

(Figure 7). The same hurricane left debris on a bike path within the park, as shown in Figure 8 from Participant 5.

Figure 7. High water levels in Rock Creek from Participant 4

Figure 8. Debris from flooding from Participant 5

Participant 6 elaborates on how heavy rainfall and storm water pose a threat to the cultural designed landscape at Dumbarton Oaks Park by stating that "*the other side has been torn apart by storm water, and the pool of water is sitting well beyond the edge of [the stream]. Storm water is a huge issue"* and also adds in *"does that impact visitor appreciation in this place? Probably not as much as I wish it did, because people would get, might get more involved if they understood what the storm water is doing to their favorite park"*. Participants 2, 5, and 6 describe the environmental setting of ROCR. Participant 2 states that *"some of the trees are 150 years old"*. Participant 5 shares Figure 9 which *"is a nice flat field which is very rare in Rock Creek Park to have a flat field because we're down by the stream…. the stream is in a fairly narrow and [goes] over a sharp, steep valley."* Participant 2 discusses that these *"little streams*

are a petty nice oasis in the heart of a city… It's cooler down here". ROCR's natural variables also face some threats. Participant 3 shares that dog waste is *"an environmental quality issue"*. Additionally, Participants 2, 3, and 6 discuss the magnitude of invasive species at ROCR. Participant 6 describes how Beatrix Farrand, a notable female landscape architect who designed Dumbarton Oaks Park in the early 20th century, incorporated *"English Ivy and Japanese Honeysuckle all over the forest floor… all of which the ultimate goal is to get it out of here"*. Participant 3 describes how *"it's rather loud [here]… it's also not the most enjoyable visitor experience"* which is attributed to the fact that *"there's not a ton of understory to the forest"*. They elaborate on how *"normally, when you go into the forest, it's so quiet because there's a blanket over you of forest. And we're missing that because of the need for restoration"*. Figure 10 displays the lack of understory in the forest described above provided by Participant 3.

Figure 9. Flat field in ROCR from Participant 5

Figure 10. Lack of understory in ROCR from Participant 5

Managerial variables at Rock Creek Park

Signage was discussed often as a current managerial influence at ROCR. There is a *"great interpretive sign"* at Peirce Mill as indicated by Participant 1 (Figure 11). However,

Participant 2 declares, *"signage is a huge issue in Rock Creek Park"* and then further explains, *"lack of signage is a huge deal".* Participant 3 echoes this statement with *"a lot of the trails throughout the park are poorly marked and hard to follow"* and shares a *"terrible sign"* (Figure 12).

Figure 11. Interpretive sign at Peirce Mill from Participant 1

Figure 12. Terrible sign at Peirce Mill from Participant 3

Another participant-identified factor influencing the visitor experience is the maintenance yard, which is a popular spot for birding, yet remaining Capitol building stones and old maintenance tools intrude on the experience and an informal path inhibits accessibility, as shared by Participant 2. Figures 13, 14, 15, and 16 display the maintenance yard, leftover Capitol building stones, remaining maintenance tools, and the informal path to the yard, respectively. Participant 2 elaborates in detail:

> **Participant 2**: When they re-did the Capitol building, they stored a bunch of the stones from the Capitol back here…The architect of the Capitol doesn't have any place to put them, so they just sit... It's kind of interesting in itself, but realistically, this has become a

storage unit, and the Park Service has been trying to get rid of these things [Capitol stones] for years…But if you come up here in the morning… there will be 20 or 30 birdwatchers here looking in the tops of these trees because this is prime bird habitat for migrating birds. It's a pretty exceptional birding area. But then you come back here. This is the sort of stuff [old maintenance tools]. And these things have been here for years, and we've been trying to get the park service to get rid of them…. when the Park Service developed a general management plan for this area, many of the comments from the birding community were that instead of walking down the path that I just walked down, why don't you improve that, you know, make it so it's accessible.

Figure 13. Maintenance yard at ROCR from Participant 2

Figure 14. Surplus Capitol Building stones from Participant 2

Figure 15. Leftover maintenance tools in ROCR from Participant 2

Figure 16. Informal trail leading to the maintenance yard in ROCR from Participant 2

Social trails are present at ROCR according to park stakeholders. Participant 2 shows, *"this path over here on our right is a social trail"* and Participant 6 mentions a *"social path up that ravine"* with fencing to *"keep people on the [formal] path".* Participants share that the Covid-19 pandemic plays a role in changing the experiences at ROCR. At Peirce Mill, Participant 1 describes how they use *"the barn when the mill is open, which we haven't been since March [2020]"*. A major experience that was changed is the use of Beach Drive, as mentioned by Participants 2, 4, and 5. Participant 2 says, *"I compliment [the NPS] immensely on closing some of these roads that aren't really needed for traffic, particularly during this Covid time"*. Participant 4 shows Beach Drive (Figure 17) and shares, *"this road has been closed to car traffic 24/7 for the last four months. It's really made a huge difference"* because now visitors can "*run on, bike on it without having to come in contact with other people"*. Moreover, ROCR has seen an increase in volunteer efforts recently according to participants. Participant 6 discloses, *"volunteers have put in 70,000 hours of volunteer service"* at Dumbarton Oaks Park. Participant

1 discusses how they *"have a number of volunteers"* who work at Peirce Mill. Participant 3 shows a sign (Figure 18) that *"marks our restoration sites"* in volunteer areas throughout the park.

Figure 17. Beach Drive in ROCR from Participant 4

Figure 18. Sign marking a restoration site from Participant 3

At Peirce Mill, Participant 1 shares how there is an old barn and *"when the mill is open, we are using the barn to show a film about Peirce Mill and to hold occasional public programs."* But Participant 5 shares how the barn is *"somewhat underutilized"* and how Peirce Mill overall *"could be much better"* because it is a *"fun place for people to go"* and they hope *"they will be able to reopen again"*. Other managerial variables include parking in ROCR, where Participant 5 elaborates by sharing that the people who drive to the park *"don't feel like they can drive to the edge of the park, park, and then walk into the park, because it's not so easy to get into the park"* and a result the visitors *"drive down into the park"*. However, this creates issues because *"the land along the creek is so valuable because it's the only flat place in the park. You got the creek and everything and to waste, to waste any of that on parking lots is really sad"* (Participant 5).

Participants also identify accessibility at ROCR as a managerial issue. Participant 2 shares that *"key issues facing Rock Creek Park and Rock Creek management is access".* Participant 1 shares, *"we're much more accessible from the West side by public transportation… It's not as accessible from the East side at this location"*. This is further escalated by ROCR being physically not inviting, as shared by Participant 5. They say *"Oregon Avenue is another very long stretch with virtually almost no inviting-ness this into the park"* but there is a *"bike path in the woods there. But it is not a very good quality bike path. It's very steep and twisty and a little bit dangerous, and a little hard to ride*".

Other participant-identified managerial challenges include managing for different uses. Participant 2 shares how the park service tries *"to keep this park as natural as they can"*. Participant 5 goes on to explain how there is conflicting use and management of the park by disclosing that *"it's sort of a national park mentality located in the middle of a city. And so...it's very oriented towards conservation…but most city parks have more of an orientation towards human use"*. They also share how *"there's not that much to do in the park…it's pretty underutilized"*. There is *"no place to get food"* as said by Participant 1. Participant 2 emphasizes, *"there's a huge backlog …just maintaining things like this, and they just don't have the money and staff to do that…. it's expensive to maintain a 2000-acre park"*, which shows the lack of resources and funding at ROCR as indicated by stakeholders

Chesapeake & Ohio Canal National Historical Park Results

At CHOH, PDV results indicate that stakeholders are focused on current social variables such as programming at the park, using the towpath for recreation, and recognizing the variety of users at CHOH. Following social variables, current managerial variables are the second most frequent sub-code with components such as visitor amenities, managerial bureaucracy, and the

complex relationship between a local Native American tribe and the NPS being discussed. With natural variables, current natural variables discuss concepts such as the dangers of the Billy Goat Trail and the Potomac River. Table 2 displays a frequency table for visitor experience codes at CHOH.

Table 2. Frequency table of visitor experiences at CHOH

Code	Sub-Code	Frequency
Social		
	Past	22
	Current	72
	Future	18
Natural		
	Past	4
	Current	5
	Future	0
Managerial		
	Past	3
	Current	56
	Future	22

Social variables at Chesapeake & Ohio Canal National Historical Park

The current social variables at CHOH include various visitor activities and perspectives. Participants 11 expresses that *"the towpath is popular for running, walking, hiking, and biking. A lot of biking on the towpath"*. Participant 12 said, *"we see an awful lot of mostly bicyclists. A lot of people use it for different reasons, but we're seeing more and more of the folks bicycling"* potentially due to the pandemic sending *"a lot of folks who might not have previously taken advantage of the Canal as a resource to get out here and experience it"*. Participant 10 describes the different trail patterns that have evolved from visitors by sharing that "*the trail is a favorite for locals …Then there's people who hike segments of it just to explore the whole thing …Then there's people who want the outdoor adventure of the entire thru-hike…Thru-cycling is also a big*

endeavor". Participant 8 says, "*for most people this is their backyard park so just by nature of that we do get a lot of folks of all different sizes, shapes, and colors and backgrounds here in the park"*, and Participant 11 states that *"there are like two or three million people who come through every year in a normal year"*. The popularity of the towpath can be attributed to the connection to the Great Allegheny Passage (GAP) Trail as indicated by participants. Participant 7 shares that in Cumberland, MD *"we pick up the Great Allegheny Passage, and that goes all the way to Pittsburgh. So, when one is so inclined you could walk or ride your bike all the way from Washington D.C. to Pittsburgh"*. Within the whole Canal, Participant 16 discusses volunteer opportunities by sharing that they *"engage maybe 1,200 volunteers a year in doing beautification and cleanup projects in the park…we try to engage volunteers to do things like pulling invasive weeds, painting picnic tables, and picking up trash"* because *"it's engaging those 1,200 people in their favorite national park"*

A variety of programming is offered at CHOH, according to participants. Participant 16 describes two programs known as, *"Canal Quarters… there are seven lock houses that people can stay overnight in"* and *"Canal for All"* a program to "*engage more people of color, mostly young people, by exposing them to nature, many of whom are not exposed to nature and helping them appreciate the national park that's in their community."* Participant 13 mentions that *"local school children visit [Cumberland Visitor Center] and take part in our Canal Classroom education programs".* Participant 14 shares how they provide lock house tours and *"[Visitors] love to come off of the Canal towpath and sit on the porch and either read or have somebody just talk to you about what's going on".* At Cumberland, MD, Participant 13 also shares that *"We do have tours of this boat that people come in. We bring our school groups out here. … There's the Cumberland [Canal Boat]"* (Figure 19). Also at Cumberland, the visitor center offers unique

experiences, as described by Participant 13 who said*, "Once you come into the museum itself … [you] start off learning about the crossroads aspect, what Cumberland was about"* and there are *"various little listening devices… There's a display that lights up here"*. They also *"have a sort of mockup¾ size Canal boat that we come onto and there's a display here talking about the mules and their importance to the Canal"*.

Figure 19. Cumberland Canal Boat from Participant 13

Some barriers to access CHOH exist as explained by Participant 9. They share that *"The cost to go to this area is $20 a person per day. You could get an annual pass for $35 but I was kind of surprised at how expensive it is…. I would say it's a barrier".* Participant 9 also thinks that *"if there is public transportation, it's not widely promoted, and if there isn't, there should be"*. Other barriers are more personal, as described by Participant 15 who shares how a local Native American tribe is still deeply impacted by the Canal today:

Participant 15: It's a beautiful area for those individuals who have lost their relationship with the earth. I's a great opportunity to get outside and see and breathe and hear the natural world. But still, that scar is there. That wound is there. We see the beauty in the land, and we see people taking advantage of it from entertainment, pleasure, relaxation perspective. But that wound is still there. And every time we see that, it's a reminder of exactly why that Canal was dug to basically help defeat our ancestors…there are places along the Canal that give you access to the river, which we see the beauty of, but nothing special about the Canal itself.

Natural variables at Chesapeake & Ohio Canal National Historical Park

Some natural variables participants shared at CHOH include wildlife impacts and the dangerous of the environmental setting. For example, Participant 11 points to *"some of the local visitors, they're Canadian geese. They get to be a problem because they wander all over the place and poop wherever they feel like it - including sidewalks. So, it could get messy sometimes".* Other natural codes shared by Participant 11 include various dangers around the Great Falls area including hiking the Billy Goat Trail system and participating in water-based activities on the Potomac:

Participant 11: It's steep. It's rocky. You have to go down the trail to the river and then you have to come back up and you have to climb rocks. I mean, I wouldn't attempt it today. I can't do that anymore. I've done it 50 years ago, but not today. They would have to come get me. And occasionally that happened. Somebody gets down there and they're climbing, and they fall. Or they twist an ankle and can't go on.

Figure 20 shows a sign warning visitors about the Potomac River; Participant 11 elaborates by sharing *"it's a dangerous river. You get out there on the river, you think 'Oh, it looks nice and*

calm'. Right underneath the river there are currents, and they will pull you under and you're done.

Figure 20. Warning sign about the Potomac River from Participant 11

Managerial variables at Chesapeake & Ohio Canal National Historical Park

At CHOH, participants identify various current managerial variables that interact with one another. Many of them include amenities, or lack thereof, such as trash cans, parking, resurfacing the towpath, bathrooms, and concessionaire. Participant 11 shares, *"this is the restroom* (Figure 21). *Fountains outside, trash baskets inside. It's the only place you can put trash. No other trash cans around in the park"* however, *"here's some trash that's just been left here (Figure 22). That's a problem during the pandemic".* Additionally, they elaborate that the parking lot, *"is a big parking lot. It probably holds maybe 200, 250 cars on a good, nice weekend day... that's really the main visitor entrance into the park"* (Figure 23) and mention the

concessionaire by sharing, "*this is a concession stand, which is now closed. The concessionaire didn't renew the contract. So, another concessionaire put in these vending machines for the time being*" (Figure 24). Also at the Great Falls Tavern, Participant 11 shares that a portion of it, *"has been refurbished as a tavern room and has old tables and chairs and artifacts in there"* and *"this other room has a video in it - the history of the Canal. And they can have lectures there and meetings and things like that. It has a few exhibits, but not much"*.

Figure 21. Restrooms at Great Falls Tavern from Participant 11

Figure 22. Overflowing trash at Great Falls Tavern from Participant 11

Figure 23. Parking lot at Great Falls Tavern from Participant 11

Figure 24. Concession stand at Great Falls Tavern from Participant 11

Regarding the towpath that runs through the park, Participant 16 expresses that the park is "trying to resurface what we call the 80 worst miles, which is the least safe miles of the towpath… This is the new surface where it's all crowned and there's no puddles, tree roots or rocks. There're no ruts" (Figure 25). Signage can be found along the towpath, but Participant 14 describes that there's "some interpretive media… along the towpath here that tells a little bit about the lock house. It's not had much attention recently, and that's another situation with some of the older wayside markers…you can barely read through the dirt" (Figure 26).

Figure 25. Resurfaced towpath from Participant 16

Figure 26. Unmaintained sign from Participant 14

In addition to amenities provided at CHOH, many participants discussed higher level managerial factors. Participant 15 extensively shares their perspective of how the bureaucratic management of the NPS impacts cultural sustainment of their local Native American tribe by elaborating that there's a place *"where our ancestors harvested soapstone for thousands of years, and we've been trying to work with the Park Service… to bring our children in there"* in order for them to *"be able to see exactly where soapstone used to be harvested and let them be able to take a piece and learn those ancient traditions and keep the culture alive"*. However, they get *"a lot of bureaucratic blowbacks about '… what are you going to do with it? Is it a commercial adventure?' All this bureaucratic red tape as opposed to saying that this is about education. This is about cultural sustainment".* Participant 15 also shares how they seek a macro agreement with the NPS in order to have a working relationship: *"What we're more interested in with the Park Service is a macro agreement … a complete regional area agreement so that*

they're understanding we're understanding, our needs, their needs, there's a way to find that happy medium."

Other higher level identified managerial variables include a lack of funding and resource allocation. Participant 7 expresses, "the park is so underfunded" and consequently, "the Park Service is sort of not focusing on Cumberland in their strategic plan. I just hope that they would continue focusing on the entire length rather than just the main population centers". Participant 13 shares additional information by stating that "there has been a shift in park priorities away from Cumberland. The assigned ranger is often pulled away to other locations, leaving county part-time staff alone to handle the needs of all visitors, including those with park-specific inquiries". For example, "the successful Canal Classroom Corp programs offered to local elementary schools was scaled back pre-Covid and shifted more to the Williamsport area of the park" and "the NPS removed its dedicated phone line in the Cumberland visitor center" in addition to there being "no part-time seasonal ranger or student conservation association positions for Cumberland since November 2019."

Emerged Identities of the Chesapeake & Ohio Canal National Historical Park

In addition to the visitor experience codes, a frequent code emerged from our open coding: identity. Identity relates to the way a place is known as, and at CHOH, we found that the park has major historical significance, but today is mostly used as a recreation destination. The Canal itself is known as a mode for westward expansion and transportation, who had competition with the B&O Railroad, and multiple Canal Towns came forth as a result of the Canal's existence. Today, heavy recreation use, as identified by participants, is what the Canal is known for. Participants also share that the future identity of CHOH lies in balancing the history and recreation of the park. Table 3 shows the frequencies of identities related to CHOH.

Table 3. Frequency table of identities at CHOH

Codes	Sub-Codes	Frequency
Past		
	Canal as a mode for westward expansion and transportation	9
	Competition with the railroad	6
	People of the C&O Canal	4
	Established as a park in 1971	3
	Historical Canal Towns	3
	Catoctin aqueduct restoration	1
	Historical floods	1
	Civil War	1
Current		
	Present Canal Towns	5
	Variety and multitude of visitors	4
	Lack of visitor knowledge	3
	Historic and natural preservation	3
	Biking the towpath is a bucket list item	2
	Various identities	1
	Good management of conflicting use	1
	Park isn't visitor friendly	1
Future		
	Managed to maintain history and provide recreational opportunities	4
	Growing as a premiere outdoor recreation experience	2
	Canal as a whole has a lot of underutilized potential	1
	Add interactive attractions on the towpath	1
	Increased NPS presence at Cumberland	1
	Strong Canal presence in every Canal Town	1

Historical identity of Chesapeake & Ohio Canal National Historical Park

Participants share that the historical identity of the Canal begins with its construction. Participant 10 details how the *"Canal was conceived in the early 1800s as a transportation corridor"* and stretches for *"184.5 miles" from "Georgetown in Washington D.C. to Cumberland, Maryland"*. However, competition with the B&O Railroad made the Canal *"almost obsolete by the railroad itself. But nonetheless it carried freight up and down the Canal for about 80 years".* Participant 12 describes the historical floods that occurred and *"[did] damage*

to parts of the Canal". Participant 10 also shares, *"when the Canal went bankrupt in 1924, it ceased operation and sat idle for decades. Then people discovered it as a recreational trail…trail hiking and cycling became so popular… then in 1971 they made this unit a national park"*. Another aspect of the historical identity of CHOH relates to the livelihoods of people who built and worked on the Canal during its initial use as a transportation corridor. Figure 27 shows a *"Celtic cross erected in memory of all the Irish immigrants who died and worked on building the Canal"* (Participant 13). After the construction of the Canal, Canal boats moved up and down the Canal and the people *"[lived] in a 12 x 12 cabin that was on that boat. They would be on that boat for months at a time. It was a type of social isolation".* Participant 10 shares that *"the lock keeper and his family were under contract with the C&O Canal Corporation, and they lived here, and they responded 24/7 to call off the Canal boat captains"*. Other historic structures include the Catoctin Aqueduct (Figure 28). Participant 12 shares the story:

Participant 12: This aqueduct had actually collapsed in the early 1970's… a local resident kind of took it on this project, formed a nonprofit group, worked hand in hand with the park service and got plans done and sure enough, here it is. I mean, rebuilt and beautiful. So, to me, it's an example of not only the history of the Canal itself, but how the park today is embraced for the resource that it is.

Figure 27. Celtic Cross at CHOH from Participant 13

Figure 28. Catoctin Aqueduct from Participant 12

Some participants discuss the communities along the Canal, which are known as Canal owns. Participant 12 details the town of Brunswick and how *"it was a Canal Town before it really became a big railroad town. So it's known for its transportation heritage".* Additionally, the Canal is known for its presence in the Civil War. Participant 14 describes that *"damage that was done to aqueducts and bridges to prevent the goods and troop movements across the river. We are right here on the border between North and South".*

Current identity of Chesapeake & Ohio Canal National Historical Park

For the current identity of the Canal, Participant 9 shares, "*it's heavily used by people from Virginia, D.C., and Maryland… It's also an international draw"*. However, Participant 13 says, *"many locals are often surprised and are not aware that a national park is in their backyard!"*. Participant 10 adds to the popularity of the Canal by stating that *"It is the most visited park in the county and it's in the top 15 in the country in national parks".*

Many Canal Towns exist along the park, and Participant 10 elaborates that the park *"contributes to the tourism economy"* because *"people come here and spend the night and they eat at local restaurants, and they buy at local retailers, and they rent cars and they buy gas and all that contributes to our economy"*. Participant 14 says, "*We definitely participate in the Canal Towns program, which is one of the really strong ways for all 18.4 miles to have a vehicle for communication"*. Regarding a management focus, Participant 12 states that the NPS *"are doing a great job in preserving the historic structures"* and also praises the NPS for *"doing a great job of being that recreation park. Maintaining safe, clean resources for folks using it for recreation, but at the same time being good stewards of the heritage that they have here, the historic structures and the like".* From a different perspective, Participant 16 says, *"I don't feel like it's very visitor friendly. It's not that every ranger isn't friendly. They are. But it's just not designed to attract more people because they already have more people than they know what to do with"*. Participant 14 elaborates similarly:

> **Participant 14**: The Canal is a wonder. It is so appreciated just as a place to get out and hike... But honestly, I do think that it is the kind of experience where people begin to see the lives of people here, and the more we can expand the understanding of the diversity of human experience along the stretch [of the Canal], that's where we're going to see the visitor experiences resonate the most, and also, you know, generate that love of the Canal that makes people want to keep it going.

Participant 13 believes that the identity of the Canal *"may be different according to different people"* and that *"it really depends on the reason for their visit… For some visitors, the C&O Canal's identity is all about a hidden and unexpected surprise of a museum and a scenic towpath to walk on"*.

Future identity at Chesapeake & Ohio Canal National Historical Park

Participant 12 believes that *"the Canal will continue to be or increasingly recognized as a great outdoor recreation experience"* because they are *"seeing more and more interest in things like bike tours. Especially longer distance ones"*. Participant 9 shares the Canal is *"very underrated and I could definitely see a greater emphasis on this and it becoming a real premiere attraction for the East Coast"*. This could perhaps occur by adding *"more interactive attractions to certain points along the path to interest more people in something new*" (Participant 13). Participant 13 also expresses that:

> **Participant 13**: At the 50th Anniversary, the projected image of the Canal should still resonate as a transportation hub for hikers and bikers, a preservation of amazing structures built by predominantly German and Irish immigrants, a place of historic significance for many families and workers who lived along the canal, and a unique trail that connects our rural, mountain area to the capital city of our country, linking paths and other recreational and heritage sites across several states.

Participant 16 thinks that one of the things *"that's interesting about the identity of it is I feel like it's a different park in each community. Each community uses it differently… I always see us valuing the historic nature of the park and all of its assets"*; Participant 13 thinks that *"our projected image of the C&O Canal should be a strong presence in every Canal town".*

SWOT Analysis of Participant-Driven Videography

In addition to the results obtained from our analysis of Objective 1, we also conducted a SWOT analysis through coding of transcriptions and memos to assess Objective 2. Results indicate that PDV faces more internal strengths than weaknesses, but more external threats than opportunities. Specifically, the internal strengths of the method itself, such as being able to

provide strong visuals and reducing power imbalances, occur more frequently than the internal weaknesses, such as freezing video and confusing information from participants. The external opportunities such as conducting a follow-up call and having more than one participant per interview, were less frequent than external threats like participants having a lack of experience with the video conference platform or having poor camera skills. Table 5 displays a frequency table for the PDV SWOT analysis.

Table 4. Frequency table of SWOT Analysis codes

Code	Sub-Code	Frequency
Strengths		
	Capture visuals	68
	Walking around the area as a transect walk	25
	Gain deep insight from participants	16
	Create a relationship with the participants	16
	Work with multiple stakeholders	16
	Examine human and nonhuman relationships	16
	Gave participants control	16
	Record verbal and non-verbal interactions	14
	Record how people engage in the landscape	14
	Capture multi-dimensionality of life	14
	Capture sounds	13
	Positive experience for the participant	6
	Researcher can ask questions about what they see	5
Weaknesses		
	Freezing video	18
	Poor audio capabilities	16
	Data analysis takes time	16
	Interviews are site specific	16
	Cutting audio	12
	Weak internet connection	8
	Limited technical capabilities	6
Opportunities		
	Alternative remote option	3
	Two participants in one video	3
	Follow-up phone call	2
	Two researchers in one interview	2
	Use internet as a supplement	1
	Include previously excluded groups	1
Threats		
	Noise interference	11
	Poor camera skills	6
	Distracted by external factors	4
	Information presentation can be bulky	3
	Lack of experience with video conferencing	2
	Poor lighting	1
	Phone battery can run out	1
	Frustrating for participant	1
	Not suitable for some participants	1

Strengths

Based on inductive coding of transcribed remote interviews and researcher-driven journaling and memoing, the SWOT analysis generally derived more mentions of strengths than weaknesses, but more threats than opportunities. More specifically, in the strength category, the most popular code "capture visuals" with 68 counts. This code pertains to anytime a participant indicated they were purposefully showing something on the screen, usually indicated by phrases said by all participants such as *"do you see that?"* and pointing out specific sites (Figure 29). For example, Participant 9 said *"you can actually see the Canal"* (Figure 30).

Figure 29. Participant 6 pointing out features in ROCR

Figure 30. C&O Canal from Participant 9

The second most frequent code is "walking around the area as a transect walk" as indicated by phrases from Participant 2 saying *"I'm going to walk across here"* and Participant 7 saying *"I'll walk over here"*. This phrase illustrates to the researcher that movement is happening from the participant. In addition to visuals being captured, the sound is recorded such

as the participant's word's and the environment around them. Participant 2 says *"can you hear the birds up there now?"* followed by bird chirping sounds, and Participant 6 asks the researcher to "*just listen to the sound for the 30 seconds"* followed by the sound of a rushing waterfall. The code "interacting with the landscape" pertains to pointing out active features of the landscape that they encounter. For example, Participant 4 shares *"here's a runner right there"* (Figure 31). Additionally, the following occurred with Participant 1 and supported with Figure 32:

> **Participant 1:** *talking to Marie* Hey Marie! I'm on the phone with someone. *talking to the researcher* Marie is our wonderful miller and I got to say she is one of the few female millers in the entire country. She is the only woman who runs a gristmill. And I don't know what she's doing right now but it's something - oh she's putting in a pump. *Marie yells something* Oh she's pumping out the tail race.

**note name has been changed*

Figure 31. Runner in ROCR from Participant 4

Figure 32. Miller at Peirce Mill from Participant 1

In all of the PDV interviews, this method granted the researcher capabilities to gain deep insight from participants about details that are site specific, as well as the chance to examine human and nonhuman relationships. For example, Participant 16 saw an off-leash, unaccompanied dog and said, *"hey buddy, going for a stroll?"*. PDV also allows for the participant to largely lead the conversation. Once they were instructed by the researcher to begin, the participant held the power of the interview since they were on-site showcasing the specific areas of importance. A final strength of PDV is that it affords a positive overall for some of the participants, such as Participant 9 who states *"this was fun"* and Participant 3 who *states "I've actually never done Zoom on my phone before. I usually just am at home on my computer. So this is a fun experiment"*.

Weaknesses

Weaknesses of this application of PDV were most often drawn from the remote application process, suggesting weaknesses would be few for an on-site application of the method due to the elimination of the remote aspect, according to our analyses. Specifically, issues related to reliance on an internet connection leading to freezing video, cutting audio, and interruptions to communication. Both the researcher and participant can experience these problems, but freezing audio was usually experienced on the researcher's end. For example, in Participant 3's interview the researcher said *"your video is frozen, but let's give it a minute"* (Figure 33) and in Participant 5's interview they said "*I can hear you, but the video is still frozen".*

Figure 33. Frozen image from Participant 3

Poor audio capabilities follow as the second most frequent code. For example, with Participant 5, the researcher said *"your voice is cutting out a little bit"* and with Participant 4 they said *"It's kind of cutting out so your voice, it's really choppy".* Similarly, another sound issue includes being unable to hear one another such as Participant 2 who said to the researcher *"can't hear you"*. These are all tied back to poor internet connection as indicated by the researcher in Participant 4's interview where the researcher said *"the internet is cutting out"* and with Participant 9 where they said *"no internet connectivity, it's to be expected with doing remote Zoom calls"*. Participant 12 shared that *"I have like one bar on the cell phone down here".* With Participant 5's interview, the internet connection acted poorly, thus impacting a large portion of the interview and caused frustration for the participant.

Moreover, technological limits of both the video application itself and using cellular devices pose challenges in utilizing PDV. Some participants experienced low volume on their devices such as Participant 4 who said, *"let me get the volume set up…. I can't… I'm right next*

to the creek" and Participant 5 who said, *"the voices are a little dim. I'm up at full volume, but I can hear you".* Two visual challenges include the video application not being able to zoom in closer to what they want to showcase as demonstrated by Participant 7 who said *"that doesn't zoom in, does it?"* and poor lighting as shared by Participant 3 who said, "*that's probably really hard for you to see, just given the glare off of it".* Technical difficulties can also occur. For example, Participant 5 who *"got a phone call which might have messed up the Zoom".* Participant 11 stated "*I got on Zoom and it said I was the only participant. I don't know if I'm doing something wrong or what's going on there."* The researcher had been on the same video conference call, but a glitch in technology or user error caused the two to be in separate video conference meetings for a brief period. Various user error poses a weakness of this method. For example, Participant 6 "*ran out of battery".* A lack of experience may present a challenge, such as Participant 1 who *"never done this on [their] phone before".* Moreover, this method may not be suitable for some participants such as Participant 15 who stated that *"It's difficult for me to shoot a video saying 'This is my favorite part of the C&O Canal thing'. This wound and this cut is better than the other cuts. So it's that perspective"*. From a research design perspective, a weakness includes data analysis and data collection taking time. These interviews took over four months to complete due to being unable to reach participants, needing to reschedule, and finding time for the participants to physically go into the park, as opposed to their office space where a traditional interview could commence.

Opportunities

Opportunities for extending the use of PDV occur before, during, and after applying the method. Before even conducting a remote PDV interview, some participants may disclose that their site choice does not have any internet connection. To address this, an alternative remote

PDV method may be the best option. We had three participants who had this issue and as a result we provided research questions ahead of time, they went to their site and recorded videos on their cellular device where they conducted a virtual tour and answered the research questions, and then shared the videos with us.

Additionally, follow-up phone call can be implemented to gain additional understanding. Participant 5 decided this would be the best route when they said, *"I should probably talk to you after I get home. I should probably get on the phone and talk to you just without, like, walking around here and everything and tell you more about the pluses and minuses of Rock Creek Park"*. The researcher also utilized the internet as a supplement to aid in the PDV process. For example, Participant 11 was unable to get to a specific location so they said, *"I think if you Google Great Falls of the Potomac, you would see pictures of it".* Participant 5 said, "*if you look at your map"* as the researcher had a map pulled up to orient themselves as the researcher walked to different places. Additional opportunities include having more than 1 participant and researcher can join in on the virtual interview. Participants 6, 11, and 14 had another person with them, sparking additional conversation from the participants themselves. Participant 14 says, "*I will ask [friend] to chime in in a minute".* Interviews conducted with Participants 14 and 15 also had two researchers conduct the interview. Researchers can also ask questions about what they see on the video provided for clarification and to spark additional conversation. For example, in Participant 16's interview, the researcher asked *"Quick question. I see this really interesting structure on your right. What is that?"*.

Threats

Using PDV is faced with some threats in application. Noise interference is the largest threat. Participant 1 said *"we're constructing new bathrooms right now … it's kind of noisy",*

Participant 11 said *"there's a helicopter going over. I'll wait until it disappears",* and Participant 14 *said "there's some truck backing up here"* followed by truck beeping noises. The participants may also become distracted by external factors such as Participant 16 who said *"remind me where I was?"* and Participant 6 who started talking to someone else saying *"you want to get this grass up. This is Johnson grass and it's going to be a killer."* Other threats to using this method include showing the participant showing themselves, not the camera and a lack of camera skills such as Participant 13 who said *"excuse my face there for a minute"* and also *"here we go, I think I'm adjusting this camera a little better."* A similar threat includes blocking the camera, as Participant 16 did and said *"I think I have my hand over the camera".* On a larger scale, the threats to applying this method from a data collection and analysis perspective include having a limited number of participants. During the recruitment process, the researcher must assure that the participants have a strong working knowledge about the study subject. During analysis, the time to analyze these rich interviews may also be time consuming, so it may not be applicable to a large sample size or long interviews. When it comes to data presentation, the information acquired may also be bulky.

Discussion

Overview

As participatory studies evolve and transition while adopting new technologies, we explored how PDV may be a useful tool for PPA researchers and management. We employed PDV to explore the social, natural, and managerial variables important to the user experience at CHOH and ROCR. Our results in both the exploration of these PPAs and the SWOT analysis lead us to provide recommendations for the application of remote PDV in the future.

Visitor Experiences at Rock Creek Park

Various visitor experience variables collaborate with one another to impact a visitor's experience within a PPA (Manning, 2007). At ROCR, we explored a multitude of social, natural, and managerial variables in an urban park that collaborate with one another across time in order to understand what constitutes a quality experience based on the perspective of stakeholders with more knowledge about the park units than your typical visitor. For example, we found that ROCR is valued as an urban oasis that offers a wide range of recreational opportunities such as gardening, biking, and walking, to name a few. Birding is a very popular activity due to the park being on a migratory flight path, and visitors flock to the maintenance yard, but the maintenance yard is not well maintained for visitors; it is filled with maintenance debris and the trail to get there is not accessible. One stakeholder would like to see it made more official and accessible, and the debris removed. This could potentially be challenging for park managers to act upon, but would enhance the birding experience at ROCR.

The Covid-19 pandemic highly impacted the visitor experience at ROCR by affecting programming and closing facilities, however the most significant impact is the opening of Beach Drive for constant outdoor recreation. Multiple stakeholders expressed how the closure of Beach

Drive for car traffic allows for increased, socially-distanced outdoor recreation that otherwise would not possible with car traffic. Keeping this road closure beyond the Covid-19 pandemic adds a major benefit to the visitor experience. Other future changes that could be implemented include utilizing the barn at Peirce Mill for public programming or community engagement.

Educating visitors and engaging them in conservation and stewardship efforts could potentially have positive benefits for both the visitor and the park. Currently, storm water is ravaging the cultural landscape at Dumbarton Oaks Park and a stakeholder believes that if visitors had a knowledge of this threat, it may spark stewardship efforts to protect Dumbarton Oaks Park. Some visitors are already participating in conservation and stewardship efforts by removing invasive species throughout ROCR, but much more needs to be done to restore the park to its full potential. Perhaps educational efforts can impact visitor behaviors because multiple stakeholders believe that many visitors don't know that ROCR is a NPS unit.

Finally, the visitor experience can be enhanced by increasing accessibility. This can be done by improving signage, since many trails are not marked or have incomprehensible signs. Park management can also improve parking and public transportation to the park to make it more inviting to the public, thus improving the experience for current visitors, but also possibly bring in new visitors who may not have known about ROCR otherwise.

Visitor Experiences at the Chesapeake & Ohio Canal National Historical Park

The social, natural, and managerial variables at CHOH provide contextual insights to the visitor experience at this park. Specifically, the towpath is used for recreation, particularly cyclists since cyclists can ride all the way from the GAP Trail that starts in Pittsburg. The area where the towpath and the GAP Trail meet is at Cumberland, MD, but there has been a lack of managerial focus at Cumberland recently due to a lack of resources and funding. Additionally,

the Covid-19 pandemic has shut down the visitor center there, thus limiting the visitor experience. According to park stakeholders, the amenities at CHOH require some maintenance such as adding in and repairing waysides and additional signage along the towpath. Some repairing of amenities is already ongoing, such as the towpath which is being resurfaced to a smoother, safer surface. This is particularly important to cyclists who ride the towpath from either Cumberland or Pittsburg.

At the Great Falls Tavern Visitor Center, visitors can experience the main entrance into the park. However, stakeholders indicated that the Great Falls Tavern Visitor Center is severely underutilized. This is partially due to the Covid-19 pandemic, but even so participants stated the visitor center is outdated and needs renovation to provide a quality visitor experience. The Great Falls Tavern area also has the only paid entrance to the park, which can be a barrier to visitation at an area that has been deemed the most popular site within the park.

Moreover, a representative from a local Native American tribe describes the negative relationship with the Canal within CHOH. The Canal itself historically was used to displace their people and fund war efforts against Native Americans in the 19th century. As a result, the Canal is viewed as a wound in the Earth and this group would like to see it filled in in order to heal from the tumultuous history. However, they do view the towpath as a positive factor because it allows people to recreate outside and be in nature. This group also seek a macro agreement with the NPS in order to have a working relationship where they can enjoy the park, and both their needs and NPS needs are met.

Multiple stakeholders shared that CHOH has a variety of experiences and users that range from locals using the park to walk their dog, to international cyclists and thru-hikers using the Canal. Because it's 184.5 miles long, there are endless opportunities to recreate and even enjoy

historic structures. Other visitors engage in beautification and clean-up volunteer efforts to lighten the workload the maintenance, sparking stewardship as a result. The park offers some programming for visitors as well such as Canal Quarters where visitors can stay in a historic lock house overnight, and Canal Classroom where students learn about the historic workings of the Canal. The stakeholders indicate that experiences at the Canal are endless.

Various Identities at Chesapeake & Ohio Canal National Historical Park

Data analysis uncovered an unexpected, emergent theme of identity of CHOH. This was interesting to discover since understanding the identity can aid in successful management of PPAs. The historical identity of the Canal was the most frequently occurring theme, thus indicating that the Canal is known for its historical identity, but that is not necessarily cohesive with the current identity of the park, which is known for recreation. Stakeholders share that the Canal is a transportation artifact and a symbol of western expansion that faced off with the Baltimore & Ohio Railroad more than a century ago. In 1971, when the Canal was established as a national historical park, the identity may have shifted. Now the Canal is perceived as more of a recreational park rather than historical, as evidenced by the heavy use of outdoor recreationists. As a result, multiple stakeholders call for a balance of managing the park to preserve the history, such as within the aqueducts or Canal boat rides, and to also place a higher focus on recreation in order to meet visitor needs. The Canal Towns that follow the Canal will also benefit from this, as many of these towns rely on recreational tourists for their economies.

Using videography allowed us to uncover this emergent code, and the context-specific factors at both ROCR and CHOH that play a role in the visitor experience which showcases how PDV can be applied to inform management in way that helps to inform future decision-making.

As a result, this highlights how future managers or researchers can employ PDV in similar studies that examine social, natural, and managerial variables within a PPA.

Findings from SWOT Analysis and Recommendations

The SWOT analysis completed indicates that PDV has more strengths than weaknesses, but more threats than opportunities. In other words, the internal strengths outweigh the internal weaknesses, but external threats to its application were found. To further explore the internal and external positive and negative factors in the SWOT analysis, we conducted axial coding to explore the relationships between the four factors. Because of this assessment, we provide strategies, or recommendations for applying remote PDV in future research management and research by organizing the SWOT into Strength-Opportunity (S-O), Weakness-Opportunity (W-O), Strength – Threat (S-T), and Weakness – Threat (W-T) strategies, as modeled after Hossain & Khanal (2020) who identified the internal and external factors of the SWOT in forest management. S-O strategies apply opportunities that add to the strengths; W-O strategies use opportunities to address weakness of PDV.

Table 5. S-O and W-O Strategies for PDV

S-O Strategies	W-O Strategies
➢ Ask broad questions in specific sites to gain rich qualitative insights	➢ Follow up as needed to gain additional relevant information
➢ Allow the participant to bring a friend to foster additional discussion and provide meaningful context	➢ Pin the video conference video on the participant so all visuals are captured
➢ Let the participant lead the conversation	➢ Instruct the participant to speak clearly into the microphone
➢ Record the video for later data analysis	➢ Consider using automatic coding to be more time efficient
➢ Ask clarifying questions about sounds you hear to spark additional conversation and gain clarity	➢ Utilize the internet (i.e., Google, park websites) to gain further clarification on the site during the interview

➢ Send research questions ahead of time to the participant so the participant can prepare their answers	➢ Work with the participant to find a suitable alternative if the current platform is not appropriate

S-T strategies use strengths to reduce threats; W-T strategies prevent threats and weaknesses from occurring.

Table 6. S-T and W-T Strategies for PDV

S-T Strategies	W-T Strategies
➢ Gain the participant's attention if they become distracted by another factor	➢ Provide written instructions of how to download and operate the video conference platform for participants who may be hesitant
➢ Consider snowball sampling to reach participants that may not have been contacted previously	➢ Alert participants when their hands are blocking the camera, video is frozen, can't hear them, etc.
➢ Let participants choose the video conference platform they are most comfortable with	➢ Obtain participant's cell phone number to contact them if sudden issues arise
➢ Have a positive attitude and be willing to problem solve in original ways that were not previously considered	➢ Instruct participants to charge their phones ahead of the interview

In addition to the strategies, or recommendations, listed, existing wider-scale observations about remote PDV should be considered and discussed to ensure that remote PDV remains a viable option to pursue. First, this data can be made available to others to validate interpretations or inform additional questions. These data were not collected to fulfill a hypothesis, but rather we sought to explore the visitor experience of two park units using PDV to gain a deeper contextual understanding of stakeholder relationships with the units. Moreover, this is one of the first studies in PPA research that wholly relies on remote technology as the means of connecting the researcher to the participant with video, and we anticipate further studies to come forth especially as participatory research continues to grow in application.

PDV in Future PPA Research

PDV may be applied in future research across study subject in PPA research. It could potentially be used in supplement with GPS data loggers in spatial-temporal studies to add footage of qualitative data along a trail between various users. Trail use has been analyzed using GPS analysis previously. For example, Peterson et al. (2020) used GPS data loggers distributed to day visitors at Theodore Roosevelt National Park in combination with interviews with park management to understand visitor travel patterns. PDV could aid in studies like this by giving cameras to visitors and asking them to share their experiences on camera which can be later analyzed, thus providing a visual qualitative element in assessing visitor travel patterns. It could also be applied to studies where stakeholders cover a large spatial extent (i.e., national and scenic trail networks). In our study, stakeholders at CHOH ranged across 184.5 miles, so PDV was useful in capturing their various perspectives as they span state borders. Finally, PDV can be used in studies that assess crowding thresholds that traditionally use photo panels, such as in Fefer et al. (2020). Because photos are one-dimensional, moving into using PDV to dynamically display issues like crowding show participants a real-world context that is multi-dimensional and therefore more representative of life. Because of the ability to conduct PDV remotely, multiple stakeholders across extensive trail networks can be accessed to understand the visitor experience, or any other qualitative variable that influence visitors or management.

Limitations

While PDV is an effective method at gathering rich data about the visitor experience, it is not without its limitations. The first challenge faced was participant recruitment. Since this study is remote, the only way to recruit is through phone or email. The sample size was already small given the nature of the sample, leading to some snowball sampling. This also led to uneven

groups, but since there is no cross group comparison, this is not a pressing issue. If future research was to include analysis between groups, a larger sample size would be desired. In addition, we recognize that we may not have captured all the information regarding our visitor experience analyses due to our limited number of participants, so a larger sample size would address that issue.

Second, the results of this study rely on honest and accurate responses by participants, which may be difficult if trust between the researcher and participant is not established. PDV was chosen based on the ability of videography techniques to build rapport between researcher and participant (Archibald et al., 2019), and we are confident that the responses shared with us were truthful through the participants own leadership of the conversation.

When exploring the utility of PDV overall as a remote method, an obvious issue is the availability of internet. Almost every video conference interview in this study had connection issues with the biggest being the video 'freezing'. This would disrupt and not only waste time in the interview, but also prevent the flow of information being shared and limit the conversation, as the participant and researcher would work to resolve this issue. Usually the issue could be resolved just by waiting and allowing the video to catch up, or by asking the participant to move to a different location where they could connect to the internet. Asking participants to choose a site with a strong connection is always an option, but may change the accuracy, quality and/or depth of information shared.

Chapter 3 - Reflection

This thesis comes as a result of adapting to an ever-changing, uncertain time to create a relatively new method that future researchers can consider and hopefully apply in their own work. I am eternally grateful for the opportunity to create a piece of work where I, nor anyone, knew where the next steps would lead. To provide an overview of how this thesis came to be, I began my Master's degree program in January 2020 with high hopes and excitement to pursue a project within the NCA. I moved to a state 650 miles from home where I knew absolutely no one, and began to pursue a new academic chapter. However, absolutely nothing could have prepared me, or anyone for that fact, for the permanent shift that was about to occur. In March 2020, the spread of Covid-19 took hold on life and suddenly everything that I had developed and worked towards in my short two months at Kansas State had changed. I wasn't sure what route to take in my thesis, our promised data collection trips to the NCA area were unclear, and anxiety was at an all-time high. The first semester of my program had come to a halt, where my only focus was completing classes remotely and not catching this alarming new virus.

As summer rolled around and travel was still limited, my advisor, Dr. Jessica Fefer, suggested conducting these remote videography interviews and I immediately jumped at the chance, as I was just grateful to be doing something productive while the world was shut down. As I began my research into what PDV is and what would the best method for moving forward with this novel opportunity, I became intrigued by the world of qualitative research and studies involving PPAs. During Summer 2020, I began the process of reaching out to stakeholders at ROCR and CHOH, and many of them were interested by this idea of doing remote video conferencing tours, as was I. I did not know what to expect or if it would even work. After my first interview, I only became more eager to continue this process and learn not just about the

parks involved, but also the process of conducting this remote research. During the months of conducting PDV interviews at the two parks, not only did I unearth more information about ROCR and CHOH that I knew what to do with, I became more confident in my abilities as a researcher and a contributor on this expansive research project.

The information uncovered in this process regarding both ROCR and CHOH has proven to be useful in other fields of this research project. When we finally were given permission to travel on-site to the NCA in August 2021, and then later in October 2021, to conduct on-site data collection via administering surveys, I realized what a blessing PDV has become to me in relaying information that I could now see in person. At ROCR, sampling at Dumbarton Oaks Park granted me the chance to share the history of this 27-acre park with my colleagues. At CHOH, seeing the towpath, Great Falls Tavern, and the Canal itself was almost surreal after only seeing recorded, fuzzy remote videos for the past year.

As this chapter of social science research comes to a close, I confidently conclude that PDV is a useful tool for PPA researchers and managers to apply in future work, and I sincerely hope that other individuals in this field consider using it in their qualitative studies. There is potential to explore so many other concepts in PPAs using PDV, even combining it with other methods. Hopefully it won't be limited by a world-wide pandemic such as this study, but at least we now know that it possible to continue moving on with qualitative social science research if such a situation occurs.

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Appendix A

Table A.1 Interview questions provided to participant's pre-interview

Group A	Group B	Group C
What past social, natural and management variables provided quality visitor experiences at Rock Creek Park?	What past social, natural and management variables provided quality visitor experiences at Chesapeake and Ohio Canal National Historical Park?	What is the story of Chesapeake and Ohio Canal National Historical Park?
What current social, natural and management variables provide quality visitor experiences at Rock Creek Park?	What current social, natural and management variables provided quality visitor experiences at Chesapeake and Ohio Canal National Historical Park?	Who are Chesapeake and Ohio Canal National Historical Park's visitors? Why?
What future social, natural and management variables would provide quality visitor experiences at Rock Creek Park?	What future social, natural and management variables provided quality visitor experiences at Chesapeake and Ohio Canal National Historical Park?	Who is not yet included in the visitor experience at Chesapeake and Ohio Canal National Historical Park? Why?
		What is Chesapeake and Ohio Canal National Historical Park's historical identity?
		What is Chesapeake and Ohio Canal National Historical Park's identity today?
		What is Chesapeake and Ohio Canal National Historical Park's identity in the future?

Figure A.1. IRB Approval Letter

KANSAS STATE UNIVERSITY | University Research Compliance Office

TO: Dr. Jessica Fefer
Horticulture and Natural Resources
Throckmorton Plant Sciences Center

Proposal Number: 9881.1

FROM: Rick Scheidt, Chair
Committee on Research Involving Human Subjects

DATE: 07/29/2021

RE: Proposal Entitled, "Research to Inform Visitor Use Management and Planning at National Capital Region Park Units"

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written – and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §104(d), category: 2, subsection: ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

Figure A.2 Example Member Check Document

Location: Melvin Hazen Restoration Area

Past social variables

Past social variables	Codes	Quotes
	Volunteers	"…we pre-pandemic had a volunteer event at least once a month..."
	Covid-19	
	Volunteers	"...We think of our volunteer events as a spark for more environmental stewardship...we have a lot of one-time volunteers..."
	Stewardship	
	Visitor activity	

"I mean, we definitely have lots of volunteers here. We pre-pandemic had a volunteer event at least once a month where we would have 20 or 25 volunteers out. And we have a couple of volunteers called Weed Warriors who work independently, and they come out usually a couple of times a month."

"When we have, you know, we get a lot of volunteers. We think of our volunteer events as a spark for more environmental stewardship. And we want people to come and, you know, spend a little time getting their hands dirty, but then understand, like, 'Oh, if I have ivy growing on my house, it could spread into the park, you know, sort of that connection between what they do in the rest of their lives and what's happening here in the park. So, as a result, we have a lot of one-time volunteers, which is great because that kind of extends the number of people we're touching on the stewardship idea. But as a result, we have to manage them pretty closely. You know, we're always training them, and we have to kind of run around and keep an eye on what they're doing to make sure that they're using the proper techniques and they're only removing the invasive plants."

Current social variables

Current social variables	Codes	Quotes
	Social trail	"But just like the neighbors that live right around here use it all the time. So, we're going to do something that visitors shouldn't do, which is we're going to go on the social trail."
	Resource description	"...The official trail goes on the other side. That's the start of Melvin Hazen Trail. So, I think they're just coming here, you know, in parts of to get somewhere else. I think it is general playing in the woods."
	Visitor activity	

Figure A.3 Example Member Check Email

Good Afternoon (Participant),

My name is (Researcher) and I'm a graduate research assistant from Kansas State University. About a year ago, you had kindly participated in a Zoom interview with me at Rock Creek Park as a part of an ongoing visitor use study for the park. Your efforts in providing rich context and information were significant and are very close in time to being shared with the park.

I am reaching out to you today to provide you with a document of how I interpreted your words during the interview. This is a part of the qualitative research process known as member checks. This document is broken up into themes, followed by codes, and supported with your quotes.

What I am asking today, is if you could please take the time to review this document and confirm with me that I interpreted your words correctly with my codes. This aids in validating the results and also makes sure that you intended to share what you said before anyone else sees the results. If you could please confirm the document by Friday September 10th, that would be excellent.

I am happy to answer any questions and look forward to hearing from you.

Thank you,
(Researcher)