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Barriers to attachment? Relationships among constraints, attachment, and visitation to urban parks

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ABSTRACT

This article examined constraints to visiting urban parks, whether constraints varied between traditionally well-served (white majority) and underserved (minorities) populations, and relationships among constraints, visitation, and place attachment for these groups. Data from two samples of Portland, Oregon (US) residents (n = 620, 2708) showed the primary constraints were limited knowledge about these parks, lack of access, and being too busy. There were minimal differences in these and most other constraints between underserved and well-served groups, but underserved residents were more constrained by race and cultural issues (e.g., lack of park visitor and staff diversity). There were no differences between groups in visitation or attachment associated with their favorite park. Constraints and visitation explained 20% of the variance in attachment for well-served residents and 29–32% for underserved residents, and constraints explained 3–18% of the variance in visitation for well-served residents and 9–11% for underserved residents. The strongest negative predictor of attachment for both groups was these parks not being the best places, and strong positive predictors for both groups were visitation frequency and lack of park facilities and services. For well-served residents, race and cultural issues were also strong predictors of attachment. For underserved residents, limited knowledge about these parks was also a strong predictor. The only predictors of visitation were fear, access, and costs.

Management implications: Managers of these parks might reduce constraints and increase visitation and attachment by improving awareness through advertising, increasing diversity (e.g., staff, visitors, programs), partnering with community organizations, enhancing facilities and services, making these parks safer and more accessible and affordable, and investigating what would make their parks interesting, welcoming, well-known, and better choices.

1. Introduction

National Geographic's headline article in October 2016 was "The power of parks: Unplugging the selfie generation," where Egan (2016) discussed concerns that technology and constraints associated with being a person of color have resulted in a generation less connected to parks than preceding generations. Jonathan Jarvis, former director of the US National Park Service, said "parks risk obsolescence in the eyes of an increasingly diverse and distracted demographic" (Egan, 2016, p. 39). Despite increased visitation to some parks in the last few years, Egan (2016) highlighted an important nexus between park visitation and two concepts in the field of outdoor recreation: (a) constraints to recreation, and (b) place attachment.

Constraints to recreation are factors (e.g., costs associated with visiting, lack of free time, inability to travel, safety issues in parks) that can affect leisure preferences, limit participation, and reduce enjoyment and satisfaction with recreation and park experiences (Jackson, 2005). The second concept, *place attachment*, involves how humans connect to locations (e.g., parks) and explores the strength of connections between people and places (see Manning, 2011 for a review). Place attachment develops over time with repeated encounters with an area such as an urban park, so a place often accrues richer meaning and attachment with more frequent visits (Brooks, Wallace, & Williams, 2007; Cucu, Ciocanea, & Onose, 2011; Gobster, 2001; Manning, 2011; Moore & Scott, 2003; Needham, Haider, & Rollins, 2016; Tuan, 1977). Given that repeated experiences with a park are associated with fostering attachment, constraints that limit visitation should theoretically reduce attachment (Brooks et al., 2007; Tuan, 1977).

One constraint that could impede visitation and attachment to some parks and other protected areas is their remoteness, which often makes

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them difficult and expensive to visit (Walker & Virden, 2005). Urban parks, however, offer more accessible natural refuges in otherwise built environments and spaces in which to unwind, connect with nature, engage in physical activity, hold social events, and participate in education programs. Despite urban parks being closer to diverse populations, people still face constraints that may influence their ability to visit and become attached to these parks. This article explored relationships among constraints, frequency of visitation, and place attachment associated with urban parks in the Portland, Oregon (US) metropolitan region. Understanding potential relationships among these concepts can inform theory and management that strive to provide accessibility for a diverse array of visitors.

1.1. Conceptual foundation

1.1.1. Constraints to outdoor recreation

Constraints have typically been categorized as intrapersonal, interpersonal, and structural factors that impede, limit, or alter recreation preferences and park visitation (Crawford & Godbey, 1987; Crawford, Jackson, & Godbey, 1991). *Intrapersonal constraints* "involve individual psychological states and attributes which interact with leisure preferences rather than intervening between preferences and participation" (Crawford & Godbey, 1987, p. 122). These constraints include stress, depression, and perceived ability in an activity (Crawford & Godbey, 1987). *Interpersonal constraints* are the result of relationships or interactions, such as differing leisure preferences among spouses or difficulty participating in leisure activities due to family obligations (Crawford & Godbey, 1987). *Structural constraints* are the furthest removed from the individual and have more to do with situational and functional characteristics that constrain recreation (Crawford & Godbey, 1987). The most prevalent constraints related to park visitation are usually structural and include inability to afford visitation costs, lack of time, lack of information, and distance from recreation resources (Mowen, Payne, & Scott, 2005; Walker & Virden, 2005; Zanon, Doucouliagos, Hall, & Lockstone-Binney, 2013).

Although this categorization has been the most widely used (Jackson, 2005; Manning, 2011), some research has integrated these three categories into a hierarchy where intrapersonal constraints are negotiated first, followed by interpersonal and then structural constraints (Crawford et al., 1991). Other researchers, however, have found a hierarchical approach to be problematic and empirical studies have experienced mixed results confirming this model (Gilbert & Hudson, 2000; Hawkins, Peng, Hsieh, & Ekland, 1999; McQuarrie & Jackson, 1996; Zanon et al., 2013). As a result, some have adopted other approaches for categorizing constraints (Floyd, Shinew, McGuire, & Noe, 1994; Shinew & Floyd, 2005; Stodolska & Jackson, 1998). Most recently, for example, Stodolska, Shinew, and Camarillo (2019) found that common categories of constraints included cost, lack of knowledge about parks and opportunities in these areas, access and transportation, time (too busy), programs and facilities, safety concerns, and issues related to race and culture (e.g., profiling, undocumented immigrant status, language barriers).

Constraints are not always felt equally by everyone. In the context of park visitation, constraints can be influenced by age, gender, race, income, and education (Walker & Virden, 2005). Walker and Virden (2005) included race/ethnicity, gender, cultural/national forces, and socioeconomic forces as macro-level (i.e., broader, societal level) factors antecedent to intrapersonal, interpersonal, and structural constraints. Many of these factors, however, act in unison and can have compounding effects on constraints (Shores, Scott, & Floyd, 2007; Stodolska et al., 2019). For example, low-income elderly women of color are often the most constrained, whereas the least constrained are often educated young-adult white males (Jun, Kyle, & Mowen, 2009; Shores et al., 2007; Zanon et al., 2013).

Washburne (1978) was one of the first to investigate relationships between race and constraints to outdoor recreation, and to suggest that racial and ethnic minorities may perceive different constraints compared to the white majority. Since this seminal article, researchers have examined inter and intra-ethnic group constraints (Bustam, Thapa, & Buta, 2011; Floyd et al., 1994; Metcalf, Burns, & Graefe, 2013; Mowen et al., 2005; Shinew, Floyd, & Parry, 2004; Shores et al., 2007; Stodolska et al., 2019; Stodolska & Yi-Kook, 2005) and immigrant constraints (see Stodolska & Yi-Kook, 2005 and Stodolska et al., 2019 for reviews). Common constraints among minorities that have been reported in some of these articles, however, are often the same as those of the majority population and include lack of time, limited information about parks and activities in these areas, travel costs, proximity to parks, fear of crime, and fear of police force.

Some studies have found that racial and ethnic minorities experience more constraints to recreation compared to non-minorities (e.g., Bustam et al., 2011; Metcalf et al., 2013; Mowen et al., 2005; Shores et al., 2007), with some of these differences at least partially explained by historic discrimination, economic and other related disadvantages, different cultural values, and personal or institutional forms of discrimination (Floyd et al., 1994; Stodolska & Jackson, 1998; Washburne, 1978; West, 1989). Others, however, have found that different factors, such as available income and free time, may be more influential than race or ethnicity in contributing to constraints (Jackson, 2005; Scott, 2013). For example, in a national (US) survey of recreation and the environment, Johnson, Bowker, and Cordell (2001) found that African-Americans and those living in urban areas were no more constrained than women and rural dwellers. Conversely, in a study of Chicago parks, Shinew et al. (2004) found that Caucasians perceived more constraints related to transportation, safety, and time than did African-Americans. Despite these mixed findings on the relative importance of demographics, race and ethnicity are commonly associated with some constraining factors such as affordability of recreation costs, residential distance from parks, lack of transportation, and fear of crime (Bustam et al., 2011; Byrne & Wolch, 2009; Jun et al., 2009; Mowen et al., 2005; Shinew et al., 2004; Shores et al., 2007; Stodolska, 2015; Stodolska et al., 2019; Stodolska & Yi-Kook, 2005; Zanon et al., 2013).

1.1.2. Place attachment in outdoor recreation

Theory related to place attachment suggests that constraining visitation to a location may influence the ability to become emotionally attached to that place (Brooks et al., 2007; Hidalgo & Hernandez, 2001; Tuan, 1977). The concept of *Topophilia*, or love of place, was introduced by Tuan (1974) to describe bonds between humans and geographical locations. Although recreation research has measured a number of dimensions of place attachment (e.g., social bonding, place familiarity, rootedness), most studies have examined these human-place relationships as a combination of both place identity and place dependence (see Manning, 2011 for a review). *Place identity* is an emotional connection to a location when an area is perceived as an essential part of one's self (Williams & Vaske, 2003). Place identity often evolves from familiarity, which is influenced by assigned meanings, childhood memories, and affinity for a particular setting (Kyle, Mowen, & Tarrant, 2004; Williams & Vaske, 2003). *Place dependence* is the functional form of attachment that reflects the importance of a place in providing physical and geographic features and conditions that support goals or desired activities (Williams & Vaske, 2003).

Place identity and dependence come together under the umbrella of place attachment and contribute to the understanding of human-place bonds. Tuan (1977) said "what begins as undifferentiated space becomes place as we get to know it better and endow it with value" (p. 6). He also said that "it takes time to know a place" (Tuan, 1977, p. 179). Theoretically, therefore, for place attachment to accrue, it is necessary to visit a place and develop a relationship with the area. Researchers have empirically tested the relationship between place attachment and frequency of visitation (see Brooks et al., 2007 for a review). Hammitt, Backlund, and Bixler (2004), for example, found that accumulated experiences in a park or visitation in a one-year period can be indicators

of emotional and functional relationships with a place. Other studies have also found positive relationships between measures of attachment or familiarity and number of prior visits (Manning, 2011; Moore & Graefe, 1994; Moore & Scott, 2003; Williams & Vaske, 2003).

1.1.3. Relationships between constraints and place attachment

The concepts of place attachment and constraints have rarely been studied together. Theory suggests that attachment requires repeated interactions with a place (i.e., visitation) and constraints can limit this visitation (Brooks et al., 2007; Jackson, 2005; Moore & Graefe, 1994; Tuan, 1977; Williams & Vaske, 2003). Some studies that have examined both constraints and place attachment have found that people who have fewer constraints are more likely to visit, and despite constraints, some people can still be attached to recreation areas (Fredman & Heberlein, 2005). In their study of Cleveland Metro parks, Jun et al. (2009) found that "least constrained" respondents had stronger attachment to these parks compared to those who were "highly constrained." Although their study examined the relationship between constraints and place attachment, they did not examine the role of visitation as part of this relationship. Fredman and Heberlein's (2005) study of backpackers and skiers in Sweden examined relationships among constraints, attachment, and visitation. They found that visitors felt less constrained than non-visitors, and discussed place attachment's ability to act as a motivator to visit despite constraints.

1.2. Research questions

This article sought to expand the current understanding of possible relationships among constraints, visitation, and attachment to urban parks. This article explored these relationships for both traditionally well-served (i.e., white majority population) and traditionally underserved (i.e., racial and ethnic minorities) residents of the Portland metropolitan region. Two research questions were explored. First, do constraints, visitation, and attachment associated with urban parks differ between traditionally well-served and underserved residents? Second, building on the literature discussed above that has suggested a positive relationship between visitation and attachment, and negative relationships between constraints and both visitation and attachment, do these relationships among concepts exist in urban parks and if so, do they differ between well-served and underserved residents? Consistent with the literature discussed above, constraints were thought to be antecedent to visitation (i.e., greater constraints, fewer visits) and visitation was thought to be antecedent to attachment (i.e., more visits, greater attachment).

2. Methods

2.1. Study region and context

Data were obtained from a mail and internet survey of residents of Clackamas, Multnomah, and Washington counties, which collectively make up the Portland metropolitan region. These counties are also the largest by population in Oregon. Portland is known for its parks and green spaces, and 17% of its acreage is park land (Harnik, Martin, & Barnhart, 2015). Many agencies manage parks in this area, including Metro, Tualatin Hills Park and Recreation District, Oregon Parks and Recreation Department, Portland Parks and Recreation, and the cities of Gresham, Lake Oswego, and Oregon City. This study focused on parks and natural areas in the Portland region in general, as well as those managed by Metro in particular. As the regional government for Clackamas, Multnomah, and Washington counties, Metro manages approximately 17,000 acres of land. This study examined all 15 areas managed by Metro at the time of this study and they include a range of development and naturalness (12 urban parks and natural areas, two boat ramps, one golf course and trail area).

2.2. Data collection

Data were obtained from two different samples: (a) a stratified random sample of residents (probability sample), and (b) a convenience sample of residents who are members of the Opt-In online panel (nonprobability sample). Questionnaires for both samples were administered from November 2016 to January 2017. The probability sample received a mixed-mode questionnaire (mail, internet) sent to households asking for one resident of each household who is over the age of 18 to complete the questionnaire. This sample was drawn randomly from the most current representative address-based postal system (ABS) combined with other databases (e.g., last name algorithms, ethnicity codes, census block clusters largely consisting of minorities) to oversample the following groups and ensure a large enough sample of racial and ethnic minority populations: African Americans/Blacks, American Indians, Asians, Hispanics/Latinos, Middle Eastern peoples, and Slavic/Eastern European peoples (Dillman, Smyth, & Christian, 2014). These groups were identified based on consultation with Metro. In the analyses, these racial and ethnic minority populations were combined into a single stratum called traditionally underserved residents. Project scope and funding limited the ability to collect large enough samples of each population to be representative of each on its own. This sample also included traditionally well-served residents as a second stratum (i.e., white majority population).

The nonprobability sample received an internet questionnaire. This sample consisted of Opt-In panel members (optinpanel.org; oregonmetro.gov/about-opt-in), which is a group of 16,598 people (at the time of this study) who volunteered at some point since this panel was launched in 2011 to be part of the online panel because they are interested in this region's community and government issues (e.g., employment, transportation, park management) and want to contribute their opinions through internet questionnaires. This panel is managed by the Pivot Research Group company and internet panels such as these include self-selected individuals who willingly join, provide some of their contact information (e.g., email addresses), and complete questionnaires on various topics multiple times a year (Brandon, Long, Loraas, Mueller-Phillips, & Vansant, 2014). Although the Opt-In panel contains mostly traditionally well-served residents, it also contains underserved residents. Demographic characteristics of Opt-In panel members are currently similar, but not identical, to those reported in the census of this region's population (optinpanel.org).

Both the internet and paper (mail) versions of the questionnaire were available in English, Latin American Spanish, Russian, Traditional Chinese, and Vietnamese. These are the five most frequently spoken languages in the Portland metropolitan region and were selected in partnership with Metro. The questionnaires for the probability sample were administered using four mailings (Dillman et al., 2014; Vaske, 2008). The first mailing consisted of a letter explaining the purpose of the study and an invitation to complete the questionnaire on the internet. Two weeks later, the second mailing consisted of a letter, paper (printed) questionnaire, and postage paid reply envelope. One week later, the third mailing consisted of a postcard reminder to complete the paper or internet version of the questionnaire. Three weeks later, a fourth mailing consisted of a letter, paper questionnaire, and postage paid reply envelope. The nonprobability sample was contacted with an initial email invitation to the entire panel requesting they complete the questionnaire on the internet, followed by two reminder emails within a two-week period.

Questionnaires were sent to 4250 residents for the probability sample with 620 completed and returned (15% response rate after accounting for undeliverables [moved, vacant]). For this sample, there were 316 traditionally well-served and 235 traditionally underserved respondents (69 were excluded because they did not answer the race/ethnicity questions). For the nonprobability sample, all 16,598 members of the Opt-In panel at the time of this study were contacted by

email to ensure a large enough sample of racial and ethnic minority populations because little information (other than email addresses) is available about individual panel members in advance, which limits the ability to stratify the sample or sample proportionately. In total, 2708 questionnaires were completed by this nonprobability sample (16% response rate from the entire Opt-In panel and 38% from those who opened at least one of the email contacts). For this sample, there were 1665 traditionally well-served and 322 traditionally underserved respondents (721 were excluded because they did not answer the race/ethnicity questions).

A telephone nonresponse bias check ($n = 137$) was administered to nonrespondents of the probability sample to determine any potential differences between nonrespondents and respondents. This nonresponse bias check contained 12 questions from the questionnaire (e.g., 1 measuring visitation, 4 measuring constraints, 5 measuring demographics including race) and no substantive differences were found. More details about the questions and results of this nonresponse bias check are reported in Needham and Rushing (2017). A nonresponse check was not possible for the nonprobability sample because other contact information (e.g., telephone numbers, mailing addresses) was not available for Opt-In panel members. Each sample, however, was weighted by census data based on county, age, sex (male, female), and education to be more representative of the study region. Race and other demographics of each sample were consistent with the census after weighting. Given the substantial number of variables and the relatively large sample sizes, a significance level of $p \leq .01$ was adopted based on the Bonferroni correction procedure to reduce the possibility of false discoveries and multiple test bias (i.e., multiple comparison problem, family-wise or experiment-wise error; Vaske, 2008). Analyses and results were conducted and reported separately for each sample (probability, nonprobability).

2.3. Analysis variables

Frequency of park visitation in the past 12 months was measured with two questions; one pertained to parks managed by Metro (times visited their one favorite Metro park) and one pertained to all parks in the Portland region in general (times visited any parks in the region). Thirty-seven constraints were measured to reflect Crawford and Godbey's (1987) three broad dimensions (intrapersonal, interpersonal, structural). These items are listed in Tables 1 and 2, consistent with those used in the literature, and reflective of possible constraints unique to the Portland region and Metro parks (Hubbard & Mannell, 2001; Jackson, Crawford, & Godbey, 1993; Metcalf et al., 2013; Metcalf, Graefe, Trauntvein, & Burns, 2015; Stodolska & Yi-Kook, 2005). These questions measured 19 constraints to visiting urban parks and natural areas in the Portland region in general (including Metro parks), and 18 constraints to visiting just Metro parks in particular. These constraints were measured on a 4-point scale from 1 "strongly disagree" to 4 "strongly agree" that it "makes it difficult for you or your family to visit." [1]

The place attachment scales were drawn from Williams and Vaske (2003) and other researchers (see Manning, 2011 for a review) who examined well-tested place dependence and identity items. These items were part of a skip pattern in the questionnaire where respondents only answered questions about attachment if they had visited at least one of the Metro parks (75% of probability sample, 88% of nonprobability sample). To reduce questionnaire length and minimize burden associated with asking about attachment for each of the 15 areas managed by Metro, respondents were only asked to identify their one favorite Metro park (from a map in the questionnaire) and respond to six attachment items based on this park. These items are listed in Table 3 and were measured on a 4-point scale from 1 "strongly disagree" to 4 "strongly agree."

The questionnaire also measured racial and ethnic identity. Respondents were considered a "minority" (traditionally underserved) if they selected any response other than "White/Caucasian" (from six categories such as Black/African American, Hispanic/Latino/Spanish) and/or considered themselves to be Slavic (from Russia, Belarus, Ukraine, Poland, Serbia, Slovakia, Croatia, Czech Republic, Slovenia, Bosnia/Herzegovina, Montenegro, Macedonia, or Bulgaria) or Middle Eastern (from Egypt, Iran, Turkey, Iraq, Saudi Arabia, Yemen, Syria, Oman, United Arab Emirates, Jordan, Palestine, Israel, Lebanon, Kuwait, Qatar, Bahrain, or Cyprus). Those who selected only "White/Caucasian" and did not also select any other response or consider themselves to be Slavic or Middle Eastern were considered a "white majority" (traditionally well-served) resident.

3. Results

Principal components exploratory factor analyses (EFA) with varimax rotation reduced the constraint items into dimensions or factors. EFA was chosen in lieu of confirmatory factor analysis (CFA) because the literature has predominantly grouped constraints into only three broad categories (intrapersonal, interpersonal, structural) and this research explored a more nuanced examination. EFAs were run separately for each sample (probability, nonprobability), first for constraints associated with visiting urban parks and natural areas in the Portland region in general, and then for other constraints associated with visiting just Metro parks in particular.

The EFAs for both samples reduced the 19 constraints associated with visiting urban parks and natural areas in the Portland region in general down to 7 factors (Table 1). These EFAs yielded identical factors and variable groupings for each sample, and all factor loadings (0.53-0.91) exceeded the common 0.40 cutoff (Tabachnick & Fidell, 2018; Vaske, 2008). Factor 1 contained five variables related to racial and cultural issues in parks in the region in general (e.g., "parks or natural areas in the Portland region do not have enough visitors representing my racial, ethnic, or cultural group"). Factor 2 contained five variables associated with fear in these parks (e.g., "I do not feel safe going to parks or natural areas in the Portland region"). Factor 3 contained three variables related to health (e.g., "poor health or physical limitations make it difficult for me to visit parks or natural areas in the Portland region"). Factor 4 had two variables about costs of visiting these parks (e.g., "the fees at parks or natural areas in the Portland region are too expensive for me"). Factor 5 contained two variables related to lack of interested recreation partners (e.g., "I do not have anyone to visit parks or natural areas in the Portland region with"). The remaining two factors each consisted of single variables (i.e., loaded on their own factors) and were retained because they represented constraints that have been identified frequently in the literature (see Manning, 2011; Stodolska et al., 2019 for reviews): (a) "I am not interested in visiting parks or natural areas in the Portland region" (i.e., disinterest), and (b) "I am too busy or do not have enough free time to visit parks or natural areas in the Portland region" (i.e., too busy).

Additional EFAs for both samples reduced the 18 constraints associated with visiting Metro parks in particular down to 5 other factors (Table 2). These EFAs yielded identical factors and variable groupings for each sample, and all factor loadings (0.42-0.94) exceeded 0.40. The first factor contained three variables related to racial and cultural issues specific to Metro parks (e.g., "Metro parks do not have programs for people in my racial, ethnic, or cultural group"). The second factor consisted of five items related to Metro parks not being the best places for recreation (e.g., "Metro parks are not the best places for the activities I enjoy doing"). The third factor consisted of three variables regarding limited knowledge about Metro parks (e.g., "before receiving this survey, I did not know where Metro parks were located"). The fourth factor had three items related to lack of facilities and services at Metro parks (e.g., "there are not enough developed facilities/services such as picnic tables, barbeques, picnic shelters, or restrooms"). The fifth factor included two items associated with limited access to Metro parks (e.g., "visiting Metro parks is hard for me because they take too

Table 1
Exploratory factor analysis (EFA) and Cronbach alpha reliability analysis of constraints to visiting all parks and natural areas in the Portland region in general [a].

Constraint factors (dimensions) and questionnaire items	Item total correlation	Alpha (α) if deleted	Cronbach alpha (α)	Factor Loading	Eigenvalue	Percent (%) variance explained
Race/cultural issues at all parks in region			.90, .93		3.59, 3.91	21.13, 23.03
Based on experience of someone close to me, I fear prejudice from staff or other visitors at parks or natural areas in the Portland region	.76, .83	.87, .90		.85, .86		
Based on my own personal experience, I fear prejudice from staff or other visitors at parks or natural areas in the Portland region	.76, .82	.87, .91		.82, .84		
Parks or natural areas in the Portland region do not have enough visitors representing my racial, ethnic, or cultural group	.81, .84	.86, .90		.84, .89		
Parks or natural areas in the Portland region do not have enough staff representing my racial, ethnic, or cultural group	.81, .83	.86, .90		.85, .89		
Information (e.g., staff, signs, programs) at parks or natural areas in the Portland region is often only in English, making it difficult for me to visit	.62, .72	.90, .92		.60, .78		
Fear			.87, .88		3.29, 3.32	19.37, 19.51
I do not feel safe going to parks or natural areas in the Portland region	.78, .83	.82, .81		.86, .91		
I fear crime in parks or natural areas in the Portland region	.70, .74	.84, .84		.84, .87		
I am afraid of outdoor places such as parks or natural areas in the Portland region	.75, .74	.83, .84		.80, .82		
I tend to avoid parks or natural areas in the Portland region because I am afraid of injury	.64, .71	.85, .85		.67, .74		
Parks or natural areas in the Portland region do not feel welcoming to me or my family	.60, .53	.86, .88		.58, .53		
Health			.89, .86		2.59, 3.37	15.22, 13.97
I have a disability that makes it difficult for me to visit parks or natural areas in the Portland region	.84, .80	.80, .76		.87, .89		
Poor health or physical limitations make it difficult for me to visit parks or natural areas in the Portland region	.79, .78	.84, .77		.87, .87		
Someone I recreate with is physically unable to visit parks or natural areas in the Portland region	.73, .65	.89, .86		.74, .68		
Costs			.84, .77		1.79, 1.76	10.55, 10.35
The fees at parks or natural areas in the Portland region are too expensive for me	.73, .63	–		.86, .87		
It is too expensive for me to travel to parks or natural areas in the Portland region	.73, .63	–		.78, .84		
No interested partners			.77, .77		1.67, 1.66	9.84, 9.75
My partner or family is not interested in visiting parks or natural areas in the Portland region	.62, .63	–		.85, .85		
I do not have anyone to visit parks or natural areas in the Portland region with	.62, .63	–		.74, .81		

[a] First numbers in each cell = probability sample, second numbers = nonprobability sample. Cumulative percentage of variance = 76.11% for probability sample and 76.61% for nonprobability sample. Two additional factors each consisted of single variables ("I am not interested in visiting parks or natural areas in the Portland region; " "I am too busy or do not have enough free time to visit parks or natural areas in the Portland region").

Table 2
Exploratory factor analysis (EFA) and Cronbach alpha reliability analysis of constraints to visiting just Metro parks in particular [a].

Constraint factors (dimensions) and questionnaire items	Item total correlation	Alpha (α) if deleted	Cronbach alpha (α)	Factor Loading	Eigenvalue	Percent (%) variance explained
Race/cultural issues at Metro parks			.94, .94		2.94, 2.72	18.38, 17.02
Metro parks do not have enough visitors representing my racial, ethnic, or cultural group	.88, .89	.89, .89		.90, .94		
Metro parks do not have enough staff representing my racial, ethnic, or cultural group	.86, .86	.91, .91		.90, .92		
Metro parks do not have programs for people in my racial, ethnic, or cultural group	.85, .86	.92, .92		.89, .91		
Metro parks are not the best places			.72, .76		2.05, 2.66	12.84, 16.61
Metro parks are not the best places for the activities I enjoy doing	.50, .56	.67, .71		.77, .79		
The activities I enjoy doing are not available in Metro parks	.46, .56	.68, .71		.53, .75		
Metro parks do not feel welcoming to me or my family	.63, .67	.62, .67		.68, .78		
Metro parks have too many rules/regulations	.49, .59	.67, .71		.65, .72		
I tend to avoid Metro parks because they are too crowded	.34, .32	.72, .76		.66, .42		
Limited knowledge about Metro parks			.77, .80		2.30, 2.23	14.40, 13.94
Before receiving this survey, I did not know where Metro parks were located	.61, .68	.69, .70		.82, .87		
I do not know where to get information about Metro parks	.61, .67	.69, .72		.79, .84		
I do know enough about what I can do at Metro parks	.60, .61	.70, .77		.76, .78		
Lack of Metro facilities/services			.70, .71		2.17, 1.97	13.57, 12.28
There are not enough developed facilities/services at Metro parks (e.g., picnic tables, barbeques, picnic shelters, restrooms)	.55, .52	.57, .63		.79, .74		
Metro parks do not provide online reservations of picnic areas/shelters	.53, .58	.60, .56		.72, .79		
Facilities at Metro parks are difficult to access for people with disabilities/mobility issues	.48, .49	.66, .67		.52, .67		
Limited access to Metro parks			.54, .52		1.33, 1.40	8.29, 8.76
There is no public transportation (e.g., buses) to the Metro parks I want to visit	.36, .34	–		.86, .80		
Visiting Metro parks is hard for me because they take too long to get to or are too far away	.36, .34	–		.52, .75		

[a] First numbers in each cell = probability sample, second numbers = nonprobability sample. Cumulative percentage of variance = 67.48% for probability sample and 68.61% for nonprobability sample. Two additional items (“Metro parks are not natural enough [there is too much development now]; ” “I cannot take pets [e.g., dogs] to Metro parks”) did not cleanly load on any factor, so were eliminated from further analyses.

Table 3
Cronbach alpha reliability analysis of place attachment to favorite Metro park [a].

Attachment factors and questionnaire items	Item total correlation	Alpha (α) if deleted	Cronbach alpha (α)
Place identity			.83, .86
I feel this park is a part of me	.71, .73	.74, .79	
Visiting this park says a lot about who I am	.71, .77	.75, .76	
The more often I visit this park, the more I feel emotionally attached to this park	.65, .69	.81, .84	
Place dependence			.84, .76
I would not substitute any other place for what I enjoy doing at this park	.77, .63	.71, .64	
No other park can compare to this park	.75, .63	.74, .65	
The more often I visit this park, the better it becomes for what I like to do	.61, .53	.84, .76	
Combined place attachment index			.88, .87 [b]

[a] First numbers in each cell = probability sample, second numbers = nonprobability sample.
[b] Alpha if deleted for each of the six variables were all less than .86 (.85-.86) for the probability sample and less than .86 (.83-.86) for the nonprobability sample, and all item total correlations were greater than .64 (.64-.71) for the probability sample and greater than .57 (.57-.72) for the nonprobability sample.

long to get to or are too far away"). Two items ("Metro parks are not natural enough [there is too much development now]; " "I cannot take pets [e.g., dogs] to Metro parks") did not cleanly load on any factor and had low loadings in ancillary analysis (e.g., higher order factoring), so they were eliminated from further analyses.

Reliability analyses of the constraints and place attachment dimensions for each sample were performed using Cronbach's alpha. An alpha of approximately .60–.65 or greater indicates that multiple variables are measuring the same factor and justifies combining them into an index (Vaske, 2008). Alpha coefficients indicated internal consistency for the dimensions of constraints associated with visiting: (a) urban parks and natural areas in the Portland region in general ("race/cultural issues at all parks in region" = 0.90-0.93, "fear" = 0.87-0.88, "health" = 0.86-0.89, "costs" = 0.77-0.84, "no interested partners" = 0.77; Table 1), and (b) Metro parks in particular ("race/cultural issues at Metro parks" = 0.94, "Metro parks are not the best places" = 0.72-0.76, "limited knowledge about Metro parks" = 0.77-0.80, "lack of Metro facilities/services" = 0.70-0.71, "limited access to Metro parks" = 0.52-0.54; Table 2). The coefficients for "limited access to Metro parks" (0.52-0.54) did not meet the recommendation of 0.60–0.65 or greater, but this factor only included two variables that consistently loaded together, face validity was apparent (e.g., "there is no public transportation to the Metro parks I want to visit," "visiting Metro parks is hard for me because they take too long to get to or are too far away"), and studies have shown access and transportation to be important constraints (e.g., Stodolska et al., 2019). Deletion of any variables from their respective factor did not improve reliability. Reliability analyses also showed internal consistency of the place attachment dimensions for each sample ("place identity" = 0.83-0.86, "place dependence" = 0.76-0.84) and for a combined index of place attachment (0.87-0.88; Table 3). [2]

The first research question focused on any differences in attachment, constraints, and visitation between traditionally underserved and well-served residents. Traditionally well-served (probability sample $M = 3.03$, nonprobability sample $M = 3.32$ on 6-point scale from 1 "never visited" to 6 "visit two or more times per week") and underserved residents (probability sample $M = 2.80$, nonprobability sample $M = 3.44$) were not statistically different in their average annual visitation to parks and natural areas in the Portland region in general, $t = 1.13$–1.66, $p = .098$-$.261$, $r_{pb} = .03$-$.08$. Traditionally underserved residents had slightly higher annual visitation to their favorite Metro park (probability sample $M = 5.89$, nonprobability sample $M = 3.39$ for open-ended response to total number of visits) compared to traditionally well-served residents ($M = 3.37$ and 2.66, respectively), but these differences were also not statistically significant, $t = 1.04$-1.13, $p = .259$-$.299$, $r_{pb} = .03$-$.06$. Traditionally well-served (probability sample $M = 2.54$, nonprobability sample $M = 2.48$) and underserved (probability sample $M = 2.62$, nonprobability sample $M = 2.46$) residents also did not differ in attachment to their favorite Metro park, $t = 0.70$–1.27, $p = .205$-$.486$, $r_{pb} = .02$-$.07$.

The most constraining factors for both traditionally well-served and underserved residents in each sample were "limited knowledge about Metro parks," "limited access to Metro parks," and "I am too busy or do not have enough free time to visit parks or natural areas in the Portland region" (Table 4). The least constraining factors were "race/cultural issues at all parks in region," "health," and "I am not interested in visiting parks or natural areas in the Portland region" (i.e., disinterest in visiting). For both samples, there were no statistical differences between well-served and underserved residents for most constraint factors after applying the Bonferroni correction. Underserved residents in both samples, however, were significantly more constrained by "race/cultural issues" at all parks and natural areas in the region in general and at Metro parks in particular, $t = 3.70$–5.07, $p < .001$. Point-biserial correlation effect sizes ($r_{pb} = .11$-$.23$) showed these differences between well-served and underserved residents were "small" to "medium" (Cohen, 1988) or "minimal" to "typical" (Vaske, 2008). Two factors ("lack of Metro facilities/services; " "too busy") were significantly more constraining for underserved residents in the probability sample ($t = 3.53$–6.58, $p < .001$, $r_{pb} = .16$-$.29$), but there were no differences between groups in the nonprobability sample ($t = 0.62$–1.02, $p = .310$-$.537$, $r_{pb} = .02$-$.03$).

The second research question explored relationships among constraints, attachment, and visitation. Ordinary least squares (OLS) multiple regression path analyses were performed to understand these relationships and whether any relationships differed between traditionally well-served and underserved residents. Dimensions of constraints served as the exogenous concepts (i.e., predictors), favorite Metro park visitation frequency served as a potential mediator, and the place attachment index for this favorite park served as the endogenous concept (i.e., criterion). [3]

For traditionally well-served residents in each sample, 20% of the variance in place attachment was explained by constraints and visitation (Fig. 1). The dimension of constraints that was negatively associated with attachment for both samples was "Metro parks are not the best places" ($\beta = -0.23, -0.39$). "Limited access to Metro parks" ($\beta = -0.14$), and "disinterest in visiting" ($\beta = -0.11$) were also negatively associated with attachment, but only for the nonprobability sample. Constraints that were positively related to attachment for these residents in both samples were "race/cultural issues at Metro parks" ($\beta = 0.17, 0.26$) and "lack of Metro facilities/services" ($\beta = 0.09, 0.15$). "Favorite Metro park visitation frequency" was also positively related to attachment for both samples ($\beta = 0.19, 0.16$). The predictor most strongly related to attachment for these residents in both samples was "Metro parks are not the best places" ($\beta = -0.23, -0.39$). Between 3% (nonprobability sample) and 18% (probability sample) of the variance in frequency of favorite Metro park visitation was explained by the constraints dimensions with "fear" ($\beta = 0.42, 0.12$) being the only significant predictor for both samples.

For traditionally underserved residents, 29% of the variance in place attachment was explained by constraints and visitation for the probability sample, and 32% of the variance was explained for the

Table 4
Differences in constraint factors (dimensions) between traditionally well-served and traditionally underserved residents.

Constraints factors (dimensions)	Mean response (*M*) [a]			*t*-value	*p*-value	Effect size (r_{pb})
	Well-served	Underserved	Total			
Limited knowledge about Metro parks						
Probability sample	2.84	2.71	2.77	1.89	.060	.09
Nonprobability sample	2.51	2.47	2.48	0.73	.452	.02
Limited access to Metro parks						
Probability sample	2.35	2.51	2.45	2.54	.012	.12
Nonprobability sample	2.54	2.50	2.53	0.87	.388	.02
Too busy to visit [b]						
Probability sample	2.39	2.66	2.54	3.53	< .001	.16
Nonprobability sample	2.37	2.41	2.39	0.62	.537	.02
Lack of Metro facilities/services						
Probability sample	2.14	2.47	2.33	6.58	< .001	.29
Nonprobability sample	2.12	2.17	2.13	1.02	.310	.03
Metro parks are not the best places						
Probability sample	2.13	2.07	2.10	1.22	.222	.06
Nonprobability sample	2.05	2.17	2.07	2.27	.023	.07
Costs						
Probability sample	1.91	2.00	1.97	1.32	.187	.06
Nonprobability sample	2.00	2.06	2.03	1.08	.279	.03
Race/cultural issues at Metro parks						
Probability sample	1.78	2.05	1.93	4.16	< .001	.20
Nonprobability sample	1.81	2.02	1.84	3.75	< .001	.12
No interested partners						
Probability sample	1.98	1.88	1.92	1.47	.142	.07
Nonprobability sample	1.80	1.77	1.79	0.51	.609	.01
Fear						
Probability sample	1.81	1.71	1.76	1.75	.081	.08
Nonprobability sample	1.69	1.78	1.72	2.12	.034	.05
Disinterest in visiting [b]						
Probability sample	1.80	1.65	1.71	2.02	.044	.09
Nonprobability sample	1.46	1.43	1.45	0.66	.509	.02
Health						
Probability sample	1.78	1.63	1.69	2.52	.012	.12
Nonprobability sample	1.67	1.61	1.66	1.25	.213	.03
Race/cultural issues at all parks in region						
Probability sample	1.49	1.77	1.64	5.07	< .001	.23
Nonprobability sample	1.51	1.68	1.55	3.70	< .001	.11

[a] Mean degree of constraints that make it difficult to visit on a 4-point scale of 1 "strongly disagree" to 4 "strongly agree."
[b] Measured with a single item in the questionnaire.

nonprobability sample (Fig. 2). Dimensions of constraints that were negatively associated with attachment for both samples were "Metro parks are not the best places" ($\beta = -0.24, -0.29$) and "limited knowledge about Metro parks" ($\beta = -0.22$). "Disinterest in visiting" ($\beta = -0.20$) and "costs" ($\beta = -0.21$) were also negatively associated with attachment, but only for the nonprobability sample. Only one dimension of constraints, "lack of Metro facilities/services" ($\beta = 0.24, 0.18$), was positively related to attachment for these residents in both samples. "Favorite Metro park visitation frequency" was also positively related to attachment for both samples ($\beta = 0.18$). The predictor most strongly related to attachment for these residents in both samples was "Metro parks are not the best places" ($\beta = -0.24, -0.29$). Between 9% (probability sample) and 11% (nonprobability sample) of the variance in "favorite Metro park visitation frequency" was explained by the constraints dimensions with only "limited access to Metro parks" significantly and negatively related to this visitation for both samples ($\beta = -0.27, -0.19$), and "costs" positively related to visitation only for the nonprobability sample ($\beta = 0.17$).

"Favorite Metro park visitation frequency" was examined for both partially and fully mediating relationships between constraints and place attachment following the analytical procedures outlined by Baron and Kenny (1986) and Vaske (2008). Frequency of visitation, however, did not mediate any of the significant relationships between the constraints dimensions and attachment for both traditionally well-served and underserved residents in each sample.

4. Discussion

4.1. Management implications

These results have implications for both research and management. From a management perspective, results showed no significant differences between traditionally well-served and underserved residents in their visitation to parks in this region in general and their favorite Metro park in particular. This suggests that agencies may be meeting their objective of reaching a diversity of residents. Despite reaching residents, constraints to visiting these parks and natural areas still exist. The primary constraints for both traditionally well-served and underserved residents were limited knowledge about these parks and natural areas, limited access, and being too busy to visit. Park management agencies in this region (e.g., Metro) may be able to address knowledge-related constraints by improving awareness and marketing of their parks and natural areas, such as providing more accessible information about locations of spaces they manage and activities that are available. To address constraints associated with accessibility, these managers might consider advertising their parks near public transportation routes and also working with city planners and managers to expand public transportation to parks and other natural areas.

There were a few significant differences in constraints between traditionally well-served and underserved residents. Underserved residents were significantly more constrained by lack of facilities and services at Metro parks (probability sample only). Underserved residents in both samples were also more constrained by race and cultural issues (both at all parks and natural areas in general and at Metro parks in particular) even though these constraints were among the lowest (i.e., few agreed they were constrained by race and cultural issues). Although race and cultural issues were relatively low constraints among most respondents, it is still important for managers to create a welcoming environment at their parks for all residents (Stodolska et al., 2019). Managers of these parks might consider mitigating these constraints by increasing diversity among park staff, creating programs relevant to racial and ethnic minorities, partnering with relevant community organizations (e.g., church groups, communities of color coalitions), and considering more facilities and services where appropriate (e.g., barbeques, picnic areas).

The path analyses showed that constraints and frequency of visitation collectively explained 20% of the variance in place attachment for traditionally well-served residents and 29–32% for underserved residents. This suggests that constraints and visitation may be slightly more important factors in place attachment for underserved residents. Place attachment is important for managers in more ways than simply having residents devoted to parks. Attachment, for example, can be associated with increased motivation to visit parks, activity involvement, pro-environmental intentions, support of management actions, volunteerism and civic engagement, respect and adherence toward rules, and visitor satisfaction (see Manning, 2011 for a review). Therefore, managing agencies can benefit by taking steps to facilitate attachment to their sites.

For example, if managers wish to increase attachment to their parks, it is imperative that they consider addressing constraints faced by

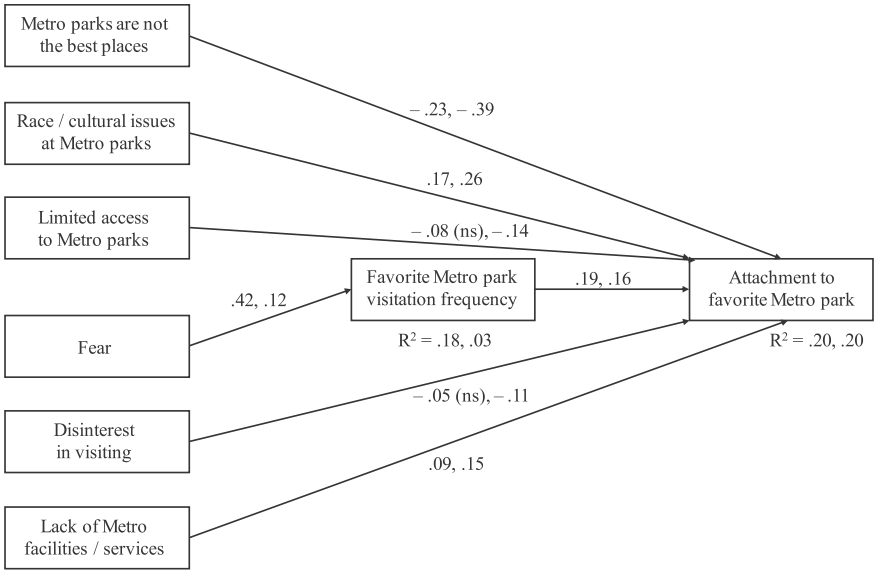

Fig. 1. Relationships among constraints, visitation, and attachment for traditionally well-served residents. Only statistically significant paths are shown based on the Bonferroni correction ($p \leq .01$) unless specified as not significant (ns). All other paths were not significant. First numbers = probability sample, second numbers = nonprobability sample.

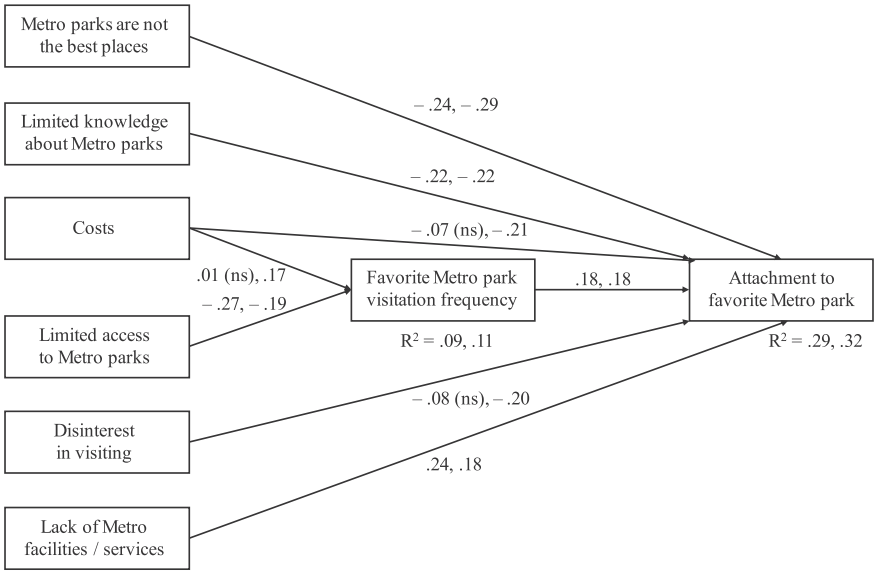

Fig. 2. Relationships among constraints, visitation, and attachment for traditionally underserved residents. Only statistically significant paths are shown based on the Bonferroni correction ($p \leq .01$) unless specified as not significant (ns). All other paths were not significant. First numbers = probability sample, second numbers = nonprobability sample.

residents. Results indicated that many of the same constraints were related to place attachment for both traditionally well-served and underserved residents in each sample (probability, nonprobability). For both of these populations, "Metro parks are not the best places" was negatively associated with attachment. To address this issue, managers might investigate what would make Metro parks and other parks and natural areas in this region better choices for residents. Conversely, "lack of Metro facilities and services" was positively associated with attachment for both populations in each sample. Although facilities and services are often rated as more important by underserved communities (Ho et al., 2005; Manning, 2011), this positive association could be explained by: (a) residents of the Portland region preferring less development in parks, and/or (b) these residents being more attached to their favorite Metro park because other parks may not provide enough facilities or services.

Traditionally well-served residents differed from underserved residents in some other meaningful ways. For example, place attachment for traditionally well-served residents was positively associated with "race/cultural issues at Metro parks" for both samples, possibly because these residents might feel comfortable as the majority or dominant race and culture in this region. In addition, attachment was negatively associated with "limited access to Metro parks" for traditionally well-served residents in the nonprobability sample, and attachment for underserved residents was negatively associated with "limited knowledge about Metro parks" for both samples and "costs" for the nonprobability sample. To address these constraints and increase attachment, the agencies might consider striving to increase resident knowledge of parks, working with city planners and transportation officials to make parks more accessible, and considering differential pricing of user fees for some residents (e.g., no fee days, discounts).

Frequency of visitation to their favorite Metro park was a positive predictor of attachment among traditionally underserved and well-

served residents in both samples. This suggests that frequency of visitation is an important factor in fostering place attachment. There were, however, some differences between well-served and underserved residents in their constraints that were significantly associated with this visitation. Frequency of visitation to their favorite Metro park among traditionally well-served residents in both samples, for example, was positively associated with "fear" of visiting other parks and natural areas, suggesting that they are likely to visit their favorite Metro park more often as they feel safer there than in other parks. Visitation for underserved residents was positively associated with "costs" for the nonprobability sample and negatively associated with "limited access to Metro parks" for both samples. It is possible that constraints associated with costs of visiting other parks and natural areas were positively associated with frequency of visitation to their favorite Metro park because these residents may be more likely to repeatedly visit affordable parks, which may include their favorite Metro park.

To address these fear, access, and cost-related constraints, and perhaps increase visitation, managers of these parks might consider taking steps to make the parks safer and more accessible (e.g., public transportation, reduce fees, create parks closer to residential areas). In fact, the questionnaire included an open-ended section and some of the most frequent comments focused on perceived safety and security issues such as homeless camping, crime (e.g., theft from vehicles), and drug use in parks and natural areas in this region (Needham & Rushing, 2017). Managers, therefore, might consider increasing staff, police patrols and enforcement, lighting, and emergency call boxes in parks and natural areas in the Portland metropolitan region.

4.2. Research implications

From a research perspective, these results showed that the most prevalent constraints to visiting parks and natural areas in the Portland region were limited knowledge about these areas, lack of access to these places, and being too busy. These findings are similar to previous research also showing that constraints related to park visitation are often structural and include lack of time, information, and access (see Manning, 2011; Zanon et al., 2013 for reviews). For example, the quantitative results found here (e.g., EFAs) were consistent with recent research by Stodolska et al. (2019) who found similar categories of constraints in their qualitative study (e.g., cost, lack of knowledge about parks and opportunities, access such as transportation, time such as being too busy, programs and facilities, safety concerns, issues related to race and culture).

Other research has also shown that underserved residents are more likely to experience constraints related to their recreation preferences and racial, ethnic, and cultural identities (Byrne & Wolch, 2009; Floyd et al., 1994; Stodolska, 2015; Stodolska & Yi-Kook, 2005; Washburne, 1978). This previous research is consistent with results here showing that underserved residents were significantly more constrained than well-served residents by race and cultural issues at Metro parks in particular and at all parks and natural areas in the Portland region in general (both samples), and by lack of facilities and services at parks (probability sample). Research has shown that racial and ethnic minorities prefer to recreate in larger groups of similar backgrounds (e.g., families, friends) and in more developed parks where facilities and services (e.g., picnic tables and shelters, restrooms) are important factors in selecting a site (Ho et al., 2005; Manning, 2011).

Results of the path analyses also confirmed the limited previous research showing that constraints and visitation are related to place attachment (Fredman & Heberlein, 2005, Jun et al., 2009), and expanded on this research by: (a) examining the role of visitation between constraints and attachment, and (b) whether these relationships differ between traditionally well-served and underserved residents. Few dimensions of constraints were significantly related to frequency of visitation to their favorite Metro park, and these constraints explained only 3–18% of visitation for well-served residents and 9–11% for underserved residents. Although speculative, these results indicate that other factors not measured here are more likely to explain frequency of resident visitation to their favorite Metro parks and suggest that these residents are negotiating most of their constraints to ensure they can still visit their favorite parks. Future research could do more to investigate the role of negotiation on relationships between constraints and visitation.

Additional relationships among constraints, frequency of visitation, and place attachment were similar for both populations (traditionally well-served, underserved) and both samples (probability, nonprobability) in many ways, and different in a few meaningful ways as well. Results, for example, were consistent with past studies showing that repeat visitation is important for developing attachment (Brooks et al., 2007; Hammitt et al., 2004; Moore & Graefe, 1994; Moore & Scott, 2003; Williams & Vaske, 2003), as frequency of visitation to their favorite Metro park was a positive predictor of attachment for both underserved and well-served residents in both samples. In addition, this visitation to their favorite Metro park was associated with fear-related constraints at other parks and natural areas for well-served residents in both samples, and access related constraints for underserved residents in both samples. These results are consistent with previous research because racial and ethnic minorities are disproportionately represented in lower socioeconomic and demographic groups (e.g., income, education, residential location), which are associated with constraints such as residential distance from parks, access, and lack of transportation (Stodolska et al., 2019; Stodolska & Yi-Kook, 2005; Walker & Virden, 2005).

Future research could expand on this work in several ways. First, more concepts, such as motivations, could be included in the path models to obtain a broader understanding of conceptual relationships and explain more variance. Motivations, for example, are considered to be important in understanding constraints and their negotiation (Hubbard & Mannell, 2001; Manning, 2011; White, 2008). Including motivations, negotiation, and other concepts in the models may help to explain some of the unexplained variance in both visitation and attachment.

Second, although research has examined constraints in a framework consisting of three broad categories (interpersonal, intrapersonal, structural; Crawford & Godbey, 1987) that are sometimes arranged in a hierarchy (Crawford et al., 1991), EFAs were performed here to explore more nuanced dimensions of this concept and relationships with other concepts, which have not been thoroughly confirmed in the existing literature (Stodolska et al., 2019). Future research is now needed to confirm these findings with CFA and structural equation modeling (SEM).

Third, some research has found that place attachment separates into dimensions of place identity and dependence (Kyle, Graefe, & Manning, 2005; White, Virden, & Van Riper, 2008; Williams & Vaske, 2003). This study here and some others (Wickham & Kerstetter, 2000; Wynveen et al., 2017), however, found these two dimensions overlap substantially and treated them as a single index of place attachment. Research is needed to understand these differences.

Fourth, place attachment research has also included additional related dimensions such as social and place bonding, familiarity, belonging, and rootedness (see Manning, 2011 for a review). Future research could examine relationships among constraints, visitation, and each of these other dimensions of attachment to improve understanding of relationships among concepts.

Fifth, at the request of the funding and managing agencies, constraints were measured for parks and natural areas in the Portland region in general and Metro parks in particular. Not measured, however, were constraints specifically associated with favorite park(s), so additional research is needed to examine if results would be similar to those found here.

Sixth, funding also limited this research to only examining racial and ethnic minorities as a single combined group. Given that each race

and culture is unique, however, future research could compare subpopulations within the "traditionally underserved" category.

Finally, this study is limited to a single geographical area (i.e., Portland metropolitan region) and results may not extend to parks and natural areas in other regions. Future research, therefore, might consider examining relationships among constraints, visitation, and place attachment across a number of additional settings and contexts.

5. Notes

1. Although "neither" or "neutral" midpoint options are commonly included in these types of bipolar scales, they were not included here based on recommendations of recent research showing that large proportions of respondents can be confused by these options, leading to inaccurate responses that affect response distributions (e.g., Sturgis, Roberts, & Smith, 2014).
2. EFAs using: (a) principal components analysis with varimax rotation, and (b) principal axis analysis with oblique rotation both showed that all three items measuring place identity and all three items measuring place dependence loaded together on a single factor. In addition, a Harman single factor test (i.e., single EFA without rotation with the number of factors fixed to one; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) showed the factor explained more than 50% of the variance (60–62%). Both of these approaches justified combining all six items into a single mean composite index measuring place attachment.
3. Ancillary analysis of variance inflation factors (VIFs for probability sample = 1.11–4.66, VIFs for nonprobability sample = 1.03–3.07) among constraints dimensions, visitation, and attachment for each sample did not show evidence of multicollinearity (Hair, Black, Babin, & Anderson, 2018).

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