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Research Proposal

The Effect of Every Kid in a Park Program on Total National Park Visitation

Introduction

Recent studies increasingly point to the importance of outdoor play in childhood development, and yet research also shows that children today are spending less time engaging in unstructured play outdoors. The Every Kid in a Park (EKIP) program was launched in Fall 2015 in an attempt to address this issue. The program allows fourth graders to obtain a free interagency pass granting the fourth graders and their families free entrance to federally managed public lands, including national parks. This study examines the effect of the Every Kid in a Park (EKIP) program on national park visitation, as a proxy for outdoor recreation and outdoor play.

Literature Review

The importance of outdoor experience for children's health has increasingly been a focus of research and discussion. Much of the contemporary dialogue around the topic began with the publication of Richard Louv's "Last Child in the Woods," in which he defines "nature-deficit disorder" as a source of behavioral problems increasingly plaguing children today (Louv 2008).

In "Repositioning Children's Developmental Needs in Space Planning: A Review of Connection to Nature," Mustapa, Maliki, and Hamzah review 20 years of studies on the benefits

of nature to children's development (2015). The authors found that children are increasingly

disconnected from nature, even showing active dislike for nature rather than being ambivalent.

This trend is attributable to urbanization, overly scheduled activities, increasing popularity of

passive indoor activities, and parents' concern for safety. Despite the recent trend away from

nature recreation, Mustapa et al. find that the benefits of nature on childhood development are

extensive, including improvements in cognitive, physical, social, emotional, and spiritual

development.

Having established the importance of outdoor play in childhood development, the

question arises: How well does national park visitation represent children's outdoor play? In

2006, Pergrams and Zaradic identified a decline in national park visitation and compared it to

several variables in their paper "Is love of nature in the US becoming love of electronic media?"

This decline had begun in 1988 (after 50 years of increase) and continued through the early

2000s. The authors found that the decline in national park per capita visits was significantly

negatively correlated with television consumption, theatre attendance, video games, internet

use, and oil prices, and concluded that the decline indicated a shift in recreation choices, from

the previous "biophilia" to "videophilia," defined by the authors as "the new human tendency to

focus on sedentary activities involving electronic media."

Following their 2006 study, Pergrams and Zaradic published "Evidence for a

Fundamental and Pervasive Shift Away from Nature-Based Recreation" (2007). The paper

responded to criticism of the 2006 study's use of per capita national park visits as a proxy for

the popularity of outdoor recreation at large. To address this concern, the authors compared

several variables, including visitation of other federal public lands in the US, visitation of federal

public lands in Japan and Spain, visitation of US state parks, hunting and fishing licenses,

number of people thru-hiking the Appalachian Trail, and more. The authors found that US National Forest visitation tracked with the US National Park visitation data; both showed steady increases for 50 years before declining around the same time. Furthermore, they found a decline in nature recreation in the other variables examined as well, including Japan's national parks and US state parks.

What are the reasons for this decline in nature recreation, and its indicator, declining national park visitation? Beyond the videophilia cited by Pergrams and Zaradic, Johnson, Bowker, and Cordell examined the topic in "Outdoor Recreation Constraints: An Examination of Race, Gender, and Rural Dwelling" (2001). The authors looked at data from the National Survey on Recreation and the Environment, a survey of 17,000 people that was conducted by the US Forest Service and the National Oceanic and Atmospheric Administration from 1991-1994. As part of the survey's administration, each of the survey respondents was randomly assigned a module on which they would be further questioned. Approximately 2000 survey respondents were assigned the "constraints" module, in which they were given a list of 14 possible constraints to participation in outdoor recreation and asked to indicate whether the constraint had affected their participation in their favorite outdoor activities. The authors found that time and money were universal common constraints for almost all groups of survey respondents.

The barriers to national park visitation in particular were analyzed in "National Park Service Fees: An Examination of Public Attitudes," a technical report by Solop, Hagen, and Ostergren commissioned by the National Park Service (2003). The report looked at the NPS Comprehensive Survey of the American Public in 2000, in which 3,515 households were surveyed. The authors found that national park entrance fees were not a significant barrier for

most respondents, but that the fees were more of a barrier for subgroups, including younger

people, racial/ethnic minorities, lower income people, and people with less education.

The literature shows that children today are spending less time playing outdoors, an

activity which is quite important in childhood development (Louv, 2005; Mustapa, Maliki, &

Hamzah, 2015). Additionally, national park visitation can serve as a proxy for outdoor recreation

at large due to its correlation with other nature recreation activities such as state park visitation,

hunting licenses, and even national park visitation in countries outside the US (Pergams &

Zaradic, 2006, 2007). Finally, cost can be a barrier to outdoor recreation, and in particular, cost

of entrance fees can be a barrier to national park visitation for underserved subgroups

(Johnson, Bowker, & Cordell, 2001; Solop, Hagen, & Ostergren, 2003). Thus, the study will

examine the effect of the waiving of entrance fees that's provided by the Every Kid in a Park

Program (EKIP) and determine if there is a correlation in national park visitation and EKIP.

Data

The study examines secondary administrative data from the National Park Service's

(NPS) Integrated Resource Management Applications (IMRA). According to their website, IMRA

provides easy access to NPS resource information for the benefit of parks, partners and the

public. IMRA's Parks Visitor Use Statistics, referred to as "STATS," contains park-specific and

national reports on a variety of visitor use metrics, such as overnight stays, park acreage, visitor

use type, and more. For the research question, the most relevant dataset was the "Annual

Visitation Report by Years: 2007 to 2017," which lists the annual visitation by park for the

10-year span of the report.

The independent variable in this model is the presence (or lack thereof) of the Every Kid in a Park program. In this instance, EKIP presence is a dummy variable, where EKIP=1 when the program is present and EKIP=0 if absent. The EKIP program was launched in fall of 2015, so in years prior to 2015, the EKIP variable would be set equal to zero in the regression. For 2015 and after, EKIP would be set equal to one. The use of year to determine presence of the EKIP program is a valid measurement, although the data from 2015 may be a bit mixed, because the program wasn't implemented until September 2015.

In this model, the dependent variable is national park visitation. The data is time series data that compares total US national park visitation by year. The dataset used here aligns well with the construct of interest, outdoor recreation. Although national park visitation is not synonymous with outdoor recreation in the US, previous research supports the use of this number as a proxy for levels of outdoor activities in the US (Pergams & Zaradic, 2007). Because the dataset is divided by national park, the visitation totals for each park must be summed to obtain a total nationwide national park visitation number for each year, resulting in a quantitative variable. Then the total visitation count can be compared across years.

Although both variables have face validity and content validity, the study does have some potential measurement issues. Namely, there is possibility for additional measurement error through the operationalization of the "Annual Visitation Report." These numbers are collected through a combination of a regression performed on numbers counted by infrared trackers counting vehicles at park entrances, and manual handheld clickers operated by park staff ("Who Counts?," n.d.). Although these methods for data gathering seem appropriate and well-suited to the unique challenge of the situation, they're perhaps not the most reliable. The data here could be noisy if staff are inconsistent in their counts, or have bias if staff consistently

under- or over-count visitation, perhaps even intentionally to inflate their park's perceived popularity or meet performance standards. Additional noise or bias could be introduced through the vehicle tracking procedure -- noise in the case of unreliable equipment, bias in the case of a faulty calculation that extrapolates visitor numbers based on vehicles. The presence of noise could also introduce poor reliability in the data.

Both EKIP program presence and national park visitation are manifest constructs because they are directly observable. The study results will provide information about a very specific, clearly defined set of constructs. Yet, the literature shows that national park visitation is correlated with outdoor recreation levels in general, including visitation of state parks and national forests, hunting and fishing licenses, and national park visitation in other countries (Pergams & Zaradic, 2007). Thus, the sample is generalizable beyond national park visitors, and we can draw conclusions about larger themes, such as levels of other outdoor recreation types and in other countries (Pergams & Zaradic, 2007)

Methods

Through the use of administrative secondary data to perform primary research, the study attempts to assess the effect of the EKIP program on the total number of national park visitors. A simple regression equation for this model is *Visitation = a + b(EKIP) + e*, where EKIP is a dummy variable. The null hypothesis is that *Visitation was unaffected by implementation of EKIP,* or *b=0,* and the alternative hypothesis is that *Visitation was affected by implementation of EKIP,* or *b≠0.*

The coefficient of interest, b, depicts the difference in national park visitation before and after the implementation of the EKIP program. I hypothesize that the coefficient of interest will

have a positive relationship with the dependent variable -- when the independent variable EKIP

increases by one unit, the dependent variable Visitation will increase as well. Thus, the

implementation of the EKIP program is associated with an increase in annual national park

visitation. Note that EKIP's status as a dummy variable adds a layer of complexity to this type of

model analysis.

The implementation of a new policy (in this case, the EKIP program) is a common type

of a natural experiment. The policy was implemented in September 2015, a date that was not

chosen because of any significance to the American public, but rather due to arbitrary,

somewhat random reasons such as convenience to policy makers. Thus, the timing of

implementation is exogenous -- participants did not self-select into the program. Because of

this, the study can compare visitation data from prior to the program (used as a control variable)

to visitation data after the program's implementation. The measure of national park visitation

data prior to the program provides a counterfactual, depicting the visitation that "would have

been" if the EKIP program had not been implemented.

The relationship could be causal, but there are some issues with endogeneity that make

determining causality more complex. The independent variable doesn't suffer from the self

selection problem because the population of interest is all potential national park visitors and the

study captures this population completely. This population did not choose to opt in or out of the

implementation of the EKIP program -- it was implemented regardless of their personal beliefs.

However, the independent variable does suffer from the issue of reverse causality,

because a growing interest in national parks could have inspired the EKIP program. In this case,

increased visitation or increased interest may have led to the design and implementation of the

EKIP program.

There is also a potential confounding variable that may create additional endogeneity in

the model. The confounding variable may be advertisement of the EKIP program, which may

have increased national park visitation, even among visitors who were not EKIP participants.

Failing to control for this confounding variable could result in omitted variable bias, in which the

relationship between the independent and dependent variables is overstated. For this reason,

the regression should attempt to address it through the use of an additional independent

variable as a control. Thus, we will modify our regression, changing it from a simple regression

to a multiple regression. To address the potential effect of EKIP program advertisement and

EKIP media coverage on national park visitation, we can add a variable that counts the

readership of EKIP-related news coverage. The new multivariate regression looks like this:

Visitation = a + b$_1$(EKIP) + b$_2$(coverage) + e.

The importance of children's outdoor play, as measured through the proxy of national

park visitation, is well-established, and EKIP aims to encourage fourth graders and others to

visit public lands by removing barriers to visitation. The findings from this study will assist

policymakers, public land administrators, and taxpayers in assessing the value and efficacy of

the Every Kid in a Park program.

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