

Is love of nature in the US becoming love of electronic media? 16-year downtrend in national park visits explained by watching movies, playing video games, internet use, and oil prices

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Abstract

After 50 years of steady increase, per capita visits to US national parks have declined since 1988. This decline, coincident with the rise in electronic entertainment media, may represent a shift in recreation choices with broader implications for the value placed on biodiversity conservation and environmentally responsible behavior. We compared the decline in per capita visits with a set of indicators representing alternate recreation choices and constraints. The Spearman correlation analyses found this decline in NPV to be significantly negatively correlated with several electronic entertainment indicators: hours of television, ($r_s = -0.743$, $P < 0.001$), video games ($r_s = -0.773$, $P < 0.001$), home movies ($r_s = -0.788$, $P < 0.001$), theatre attendance ($r_s = -0.587$, $P < 0.025$) and internet use ($r_s = -0.783$, $P < 0.001$). There were also significant negative correlations with oil prices ($r_s = -0.547$, $P < 0.025$), foreign travel ($r_s = -0.452$, $P < 0.05$), and Appalachian Trail hikers ($r_s = -0.785$, $P < 0.001$). Income was significantly positively correlated with foreign travel ($r_s = 0.621$, $P < 0.005$) but negatively correlated with national park visits ($r_s = -0.697$, $P < 0.005$). There was no significant correlation of mean number of vacation days, indicating available vacation time is probably not a factor. Federal funding actually increased during this period, and so was rejected as a probable factor. Park capacity was rejected as limiting since both total overnight stays and visits at the seven most popular parks rose well into the mid-1990s. Aging of baby boomers was also rejected as they are only now reaching retirement age, and thus during the period of visitation decline were still of prime family vacation age. Multiple linear regression of four of the entertainment media variables as well as oil prices explains 97.5% of this recent decline ($r = 0.975$, multiple $r^2 = 0.950$, adjusted multiple $r^2 = 0.925$, $SE = 0.015$, $F = 37.800$, $P < 0.0001$). We may be seeing evidence of a fundamental shift away from people's appreciation of nature (biophilia, Wilson 1984) to 'videophilia,' which we here define as "the new human tendency to focus on sedentary activities involving electronic media." Such a shift would not bode well for the future of biodiversity conservation.

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Keywords: Entertainment media; Multiple linear regression; National park visitation; Natural areas; Oil prices; Outdoor recreation; Spearman correlation; Videophilia

1. Introduction

Annual variation in US national park attendance has been previously examined in relation to several factors: population size and age structure (Murdock et al., 1991), income (More, 2000), changing ethnic composition (Murdock et al., 1991; Baas et al., 1993; Carr and Williams, 1993; Gramann and Allison, 1999), and climate change

(Loomis and Crespi, 1999; Mendelsohn and Markowski, 1999). Distance and origin of travel (e.g., Eagles et al., 2000), motorized traffic laws (e.g., Jallo et al., 2005) and urban/rural migration patterns (e.g., Marcouiller and Green, 2000) have all proven to be significant components of visitation to individual parks, but do not explain annual variation in visitation on a national level.

It has been found important that people be exposed to natural areas as children if they are to care about them as adults (Duda et al., 1998). Similarly, it has been found that environmentally responsible behavior results from direct

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contact with the environment rather than knowledge of ecology (Hungerford and Volk, 1990). Extended periods spent in natural areas, as well as a role model, seem to create the most environmentally responsible behavior (Matthews and Riley, 1995) and increased involvement in biodiversity conservation (Chawla, 1998). More generally, Kellert and Wilson (1993) have gathered together writings on the basis and expression of human values of nature, and Kellert (1996) has continued to write on values and perceptions relating to the conservation of biological diversity.

Although some previous work has examined annual variation in park visits, the long term decline in per capita US national park attendance since 1988 was only recently reported (Pergams et al., 2004 Fig. 5, this paper Fig. 1), and this is the first attempt to account for this decline. Also, this paper uses different methodologies than previous works, which mostly used opinion surveys. Surveys given in the present cannot fully assess people's opinions in 1988, for example—the year the decline in visitation began. Also, survey data is expensive and difficult to obtain.

We performed an essentially ecological analysis, and searched for factors potentially explaining the decline using

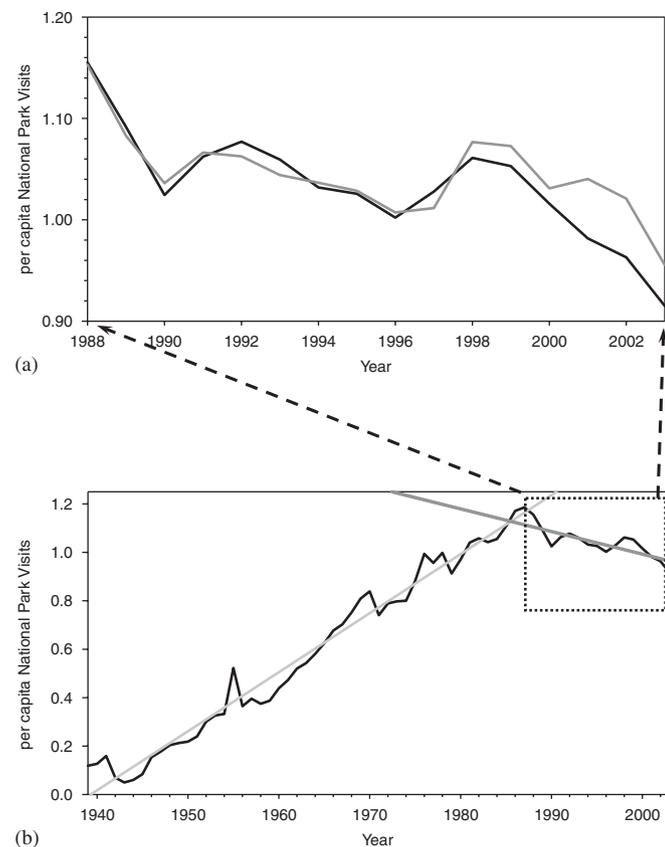


Fig. 1. (1b) Per capita US national park attendance from 1939 until 2003 is graphed in black. In light gray is a linear regression calculated using park attendance between 1939 and 1987; and in dark gray, from 1988 until 2003. (1a) The attendance portion of the graph from 1988 until 2003 in the dashed box is expanded to show both the actual attendance data (black) and the multiple linear regression model (gray) of four entertainment media variables and oil prices.

correlation analysis and multiple linear regressions of various time series. This allowed us to go back in time through the entire period of decline in visitation. We chose as variables those factors (1) which we thought might be causal and (2) for which we were able to obtain time series going back to at least 1988. All of our data were collected on an annual basis, however the things the variables represented and the ways in which these things were measured were often very different. The merit of ecological analysis is that variables may be compared which do not have the same scale or are not measured in the same way. Thus, cumulative annual hours spent playing video games may be compared to average annual oil prices to average annual per capita visits to national parks. Correspondingly (and as a result), the shortcoming of ecological analysis is that there is no one-to-one substitution possible among variables. We are comparing trends in pastimes, not suggesting that one internet visit for example is equivalent to one national park visit. We would like to emphasize that the factors we examined are in no way purported to be exhaustive. We merely hope that this work is sufficient to catalyze further, more detailed and comprehensive study.

The National Park system is incredibly diverse, ranging from flagship parks (Yellowstone, Yosemite) to smaller urban parks (Golden Gate, National Mall, Fire Island) and National Battlefield and Historic sites. The National Park system is also dynamic, changing in acreage with new acquisitions (Marsh, Billings, Rockefeller; see also Pergams et al., 2004, Fig. 6) and management strategy with new fee schedules (1996, fee demo program) and management structures (privatization of park services). In spite of land additions or management and fee structure changes, per capita park visitation steadily increased for at least 49 years from at least 1939 (the beginning of our data) through 1987, but has steadily declined now for at least 16 years. The stability of this decline across both flagship and smaller parks suggests causal factors operating at a national scale.

Given the enormous rise in electronic entertainment media since the mid-1980s, we decided to evaluate the hypothesis that Americans' increasingly sedentary recreational pastimes (Gordon-Larsen et al., 2004) explained the decline in US national park visits. We were able to find data for several examples: hours of television, video games, home movies, theatre attendance and internet use per year. Additional variables we considered included federal funding to parks, park capacity, ecotourism and foreign travel, more extreme outdoor recreation [as represented by complete (3500 km) Appalachian Trail (AT) hikers], reduced number of vacation days, median family income, and the aging of baby boomers. Given the use of automobiles to travel to national parks, we also evaluated the effect of oil prices. Data were not available prior to 1988 for internet usage and video game hours, though arcade (as opposed to home) video games began in the early 1980s. As a result all comparisons were made using annual data from 1988 to 2003, which encompass the period of visitation decline.

2. Methods

Three methods of analysis were used, two statistical (correlation and multiple linear regression) and one visual (graphical examination of park capacity). We used SYSTAT v. 9 (SPSS, Inc., 1998a) for all analyses except multiple linear regression, for which we used StatView v. 5.0 (SAS Institute, Inc., 1998).

2.1. Correlation analyses

The variables compared in correlation analyses are presented in Table 1. The table gives the abbreviations of the variables, their descriptions, how they were calculated, and the source(s) of the data. When possible, hyperlinks are included to bring the reader directly to the data. Annual data for all variables were compared from 1988–2003 ($N = 16$), the period of decline in national park visitation (NPV).

Data were first examined for normality of distribution through inspection of normal probability plots (Afifi et al., 2004) and Lilliefors test (SPSS, Inc., 1998b). Home movie hours (VIDHRS), movie theater hours (THTHRS), video game hours (GAMEHRS), internet hours (INTERHRS), and number of people completing the AT were not normally distributed, so the Spearman rank-order correlation analyses were performed on all variables. Because relatively constant long-term trends in the various time series could be responsible for part of any correlation found (heteroskedasticity, or lack of equal variance), we

also sought to remove this potential artifact by examining short-term linkages. To do so we compared the percent change from year-to-year of all variables in a difference model. Confirmatory factor analysis was performed as appropriate, using principal components, a covariance matrix, minimum Eigenvalue = 1.0, and a Varimax rotation.

2.2. Park capacity

An alternative to the hypothesis that the lure of alternate recreation choices explains the decline in park visits is the hypothesis that National Park Service (NPS) properties reached maximum visitation capacity in the late 1980s. The capacity hypothesis may be stated as follows: (1) the most popular NPS properties began reaching their maximum daily attendance capacity around 1987, and (2) visitors that were turned away during peak periods at the most popular national parks chose some alternate recreation, thereby reducing the total per capita NPV rate.

In this study, the seven most popular NPS properties were chosen based on 2003 total overnight stays and total recreational visits (as defined by the NPS, please see <http://www2.nature.nps.gov/stats/>). These properties were, in order of decreasing annual number of total recreational visits: Rocky Mountain National Park (NP), Olympic NP, Grand Canyon NP, Lake Mead National Recreation Area, Great Smoky Mountains NP, Yosemite NP, and Yellowstone NP. These seven properties were responsible for 13%

Table 1
Definitions and sources of data used in this paper

Variable	Definition	Data source
NPV	Total recreational visits to all NPS properties/total US population)	http://www2.nature.nps.gov/stats/ & http://www.census.gov/
TVHRS	Average hours per person per year spent watching television in the US	Statistical abstracts of the USA http://www.census.gov/statab/www/
VIDHRS	Average hours per person per year spent watching home movies in the US	Statistical abstracts of the USA http://www.census.gov/statab/www/
THTHRS	Average hours per person per year spent watching movies in theaters in the US	Statistical abstracts of the USA http://www.census.gov/statab/www/
GAMHRS	Average hours per person per year spent playing video games in the US	Statistical abstracts of the USA http://www.census.gov/statab/www/ additional data purchased from Mediamark, Inc.
INTERHRS	Average hours per person per year spent on the internet in the US	Statistical abstracts of the USA http://www.census.gov/statab/www/
OIL	Inflation-adjusted (to 1996 \$) domestic crude oil, year-average	http://www.inflationdata.com/inflation/inflation_rate/Historical_Oil_Prices_Table.asp & http://www.federalreserve.gov/rnd.htm
FUNDING	Inflation-adjusted (to 1996 \$) federal budget actual outlays to the NPS/area of all NPS properties	http://www.whitehouse.gov/omb/budget/ & http://www.federalreserve.gov/rnd.htm & http://www2.nature.nps.gov/stats/
AT	Number of hikers completing all 3500 km of the Appalachian Trail/total US population)	http://www.appalachiantrail.org/hike/thru_hike/facts.html & http://www.census.gov/
FORTRAV	Inflation-adjusted (to 1996 \$) spent on foreign travel/total US population	http://www.bea.gov/bea/dn/nipaweb/TableView.asp#Mid, line 100 ; http://www.census.gov/ , & http://www.federalreserve.gov/rnd.htm
INCOME	Median family income (family households category)	http://www.census.gov/
VACADAY	Mean number of vacation days per employee per year	http://www.bls.gov/

of total visits and 43% of total overnight stays at all NPS properties.

If these parks were instrumental in causing the general per capita decline we would expect to see both visits and stays to peak around 1987 and plateau thereafter, as their capacity was repeatedly and fully utilized. We therefore formed graphs to look for these peaks and plateaus.

2.3. Multiple linear regressions

With NPV as dependent variable and television hours (TVHRS), VIDHRS, THTHRS, GAMEHRS, INTERHRS, average annual oil prices (OIL), AT, and money spent on foreign travel (FORTRAV) as independent variables, automatic backward stepwise multiple linear regression was performed with Alpha-to-Enter = 0.150 and Alpha-to-Remove = 0.150. Minimum tolerance for entry into model = 0.000001.

3. Results

The Spearman correlation analyses found NPV to be significantly negatively correlated with all of the electronic entertainment indicators: hours of television ($r_s = -0.743$, $P < 0.001$), video games ($r_s = -0.773$, $P < 0.001$), home movies ($r_s = -0.788$, $P < 0.001$), theatre attendance ($r_s = -0.587$, $P < 0.025$) and internet use ($r_s = -0.783$, $P < 0.001$). Factor analysis confirmed that these variables loaded onto NPV, and that the first rotated component explained 98.9% of variance. There were also significant negative correlations with oil prices ($r_s = -0.547$, $P < 0.025$), foreign travel ($r_s = -0.452$, $P < 0.05$), and AT hikers ($r_s = -0.785$, $P < 0.001$). Income was significantly positively correlated with foreign travel ($r_s = 0.621$, $P < 0.005$) but negatively correlated with national park visits ($r_s = -0.697$, $P < 0.005$). There was no significant correlation of mean vacation days ($r_s = 0.097$, $P = 0.18$). Federal funding actually increased during this period, and so was rejected as a probable factor. It is possible that although federal funding increased, special mandates (endangered species, new health/safety regulations) consume much more of the budget resulting in a net deficit of park management and maintenance dollars. The park by park detailed budgetary data required to evaluate increased responsibilities versus budget increase was not available. Moreover, there is nothing to suggest special mandates should have a greater effect beginning in 1987. For example, the Endangered Species Act was passed in 1973 and the Americans with Disabilities Act was passed in 1996, yet neither of these major mandates appear to substantially alter the trend in per capita park visits (Fig. 1b). The first wave of baby boomers are only now reaching retirement age (Gendell, 2001), suggesting that the period of visitation decline (1988–2003) would still be prime family vacation time for the boomer generation. Thus, the ageing of baby boomers was also rejected as a probable factor. Comparing year-to-year percent changes

of all variables in a difference model resulted in two factors significantly correlated with short-term, annual changes in per capita national park visits: hours spent watching home movies ($r_s = -0.6240$, $P < 0.01$) and oil prices ($r_s = -0.518$, $P < 0.025$).

In our visual examination of park capacity, Figs. 2 and 3 show total annual recreational visits and overnight stays by park from 1979 to 2003. Were total visits and stays constrained by reaching maximum capacity, we would expect to see peaks around 1987, with continuing plateaus thereafter. Instead, we see visits increasing steadily through the late 1990s, with additional peaks in 1995 and 1999. We also see overnight stays increasing through the early 1990s, with an additional peak for most parks in 1992.

Full results from multiple linear regressions are given in Table 2. Four of the five entertainment media variables as well as inflation adjusted oil prices explained 97.5% of the recent 16-year decline in per capita US national park visits (multiple $r^2 = 0.950$, adjusted multiple $r^2 = 0.925$, SE = 0.015, $F = 37.800$, $P < 0.0001$, Fig. 1a). Significant entertainment media effects were per capita hours spent watching home movies ($P = 0.0003$), playing video games ($P = 0.0066$), on the internet ($P = 0.0012$) and in movie theatres ($P = 0.0195$). Variables rejected as not significant to the step-wise multiple linear regressions were per capita hours spent watching television, AT hiking and foreign

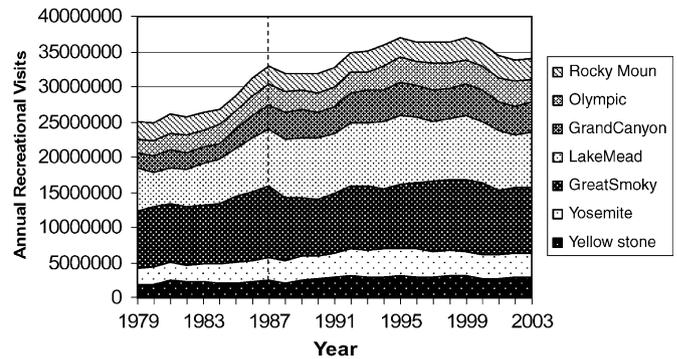


Fig. 2. Total recreational visits at the seven most popular US national parks 1979–2003. Dotted line indicates peak per capita total attendance.

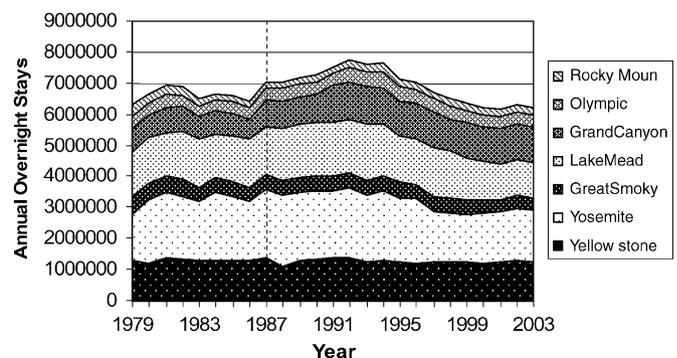


Fig. 3. Total overnight stays at the seven most popular US national parks 1979–2003. Dotted line indicates peak per capita total attendance.

Table 2
Full results of automatic backward stepwise multiple linear regression, NPV versus 5 independents

(a) Regression summary					
Count	16				
Num. missing	0				
<i>R</i>	0.975				
<i>R</i> ²	0.950				
Adj. <i>R</i> ²	0.925				
RMS residual	0.015				
(b) ANOVA table					
	DF	Sum of squares	Mean square	<i>F</i> -value	<i>P</i> -value
Regression	5	0.044	0.009	37.800	<0.0001
Residual	10	0.002	2.306E-4		
Total	15	0.046			
(c) Regression coefficients					
	Coefficient	Std. error	Std. coeff.	<i>t</i> -Value	<i>P</i> -Value
Intercept	1.1611	0.108	1.1611	14.948	<0.0001
Video hours	−0.003	0.001	−0.795	−5.388	0.0003
Theater hours	−0.023	0.008	−0.318	−2.777	0.0195
Video game hours	−0.003	0.001	−1.433	−3.419	0.0066
Internet hours	0.002	3.468E-4	1.794	4.444	0.0012
Oil price	−0.006	0.001	−0.422	−4.634	0.0009

travel. Finally, oil prices were also a significant effect explaining national park visits ($P = 0.0009$).

4. Discussion

After many decades of iconic status in American family recreation, National Parks visits may be one casualty of a social change in values characterized by our increasing pursuit of electronic media entertainment. Increased use of video games, home movies, theatre attendance and internet combined with inflation adjusted oil prices explains the majority of the 16-year decline in per capita US national park visits (linear regression model, $r = 0.975$, adjusted multiple $r^2 = 0.925$, $SE = 0.015$, $F = 37.800$, $P < 0.0001$, Fig. 1b). This suggests that even if our rising love of electronic media is not directly responsible for keeping us away from National Parks, both are a manifestation of an ongoing cultural change in values.

Correlation is of course not causation. One may object that any two trending time series will show correlation regardless of there being any causal connection. We have several replies to such an objection. Most broadly, we are generating a plausible hypothesis with the hopes that further research will test our model. The preliminary mode of testing support for our hypothesis is correlation, in an ecological analysis.

Second, one part of our analysis removed possible effects of heteroskedasticity by comparing % year-to-year changes of the variables in a difference model rather than comparing raw values. Two variables were significantly correlated with % year-to-year changes in park visits: hours spent watching home movies and oil prices.

Third, we must note that a raw r value of 97.5% in a multiple linear regression denotes a huge amount of explanatory power. The two factors significant in % year-to-year change correlations also led the way in explaining this regression (hours spent watching home movies with $P = 0.0003$ and oil prices with $P = 0.0009$), but the other three factors were not far behind. It is a little hard to imagine logically related factors with this much explanatory power being totally devoid of causal connection.

That the variables we consider are indeed logically related to NPV is our last response. What the entertainment media variables have in common with NPV is, quite simply, that all these factors are competing for our limited time. Our days have 24 h, our weeks have seven days, and our years have 52 weeks. The average person in the US went from spending 0 h/year on the internet in 1987 to spending 174 h/year on the internet in 2003, and from spending 0 h/year playing video games in 1987 to spending 90 h/year in 2003. Again we must note that the prevalence of home video games and internet use essentially came into existence around the time park visitation started declining, and feel this increases the likelihood of causality to some extent. Watching movies at home and in theatres increased another 63 h/year during this period. Altogether the average person in the US spent 327 more hours/year on these entertainment media in 2003 than he or she did in 1987, an incredible increase in time. Of course, some of the increase in time spent on the internet is undoubtedly time spent while at work, and so would not necessarily take away from free time or the opportunity to visit national parks. However, one may still conclude that if we spend huge and increasing amounts

of time watching movies, playing video games, and on the internet (while not at work), we will have a great deal less time left over for doing anything else, including going to national parks. The fact that there was no significant correlation between NPV and mean vacation days seems to indicate that availability of vacation time is not an issue. So it is not that people have less time to go to national parks, rather it is that they are choosing to spend their time otherwise.

One must also note that all of the entertainment activities are essentially sedentary, and that visiting a national park is (at least somewhat) less so. Much has been written on the increase in sedentary lifestyles as an explanatory factor for the rise in obesity in the US (Flegal et al., 2002; Skidmore and Yarnell, 2004). Time spent in sedentary media activities has been implicated in directly reducing the amount of discretionary time spent in physical activity (Skidmore and Yarnell, 2004; Fotheringham et al., 2000; Utter et al., 2003). We think it likely that these increases in sedentary lifestyles and recreation affect how much people are willing to go to national parks, as well as how much time they have to go to them.

However, there are other things going on: per capita people finishing the AT approximately tripled (though the actual numbers are still small), and per capita, inflation-adjusted expenditures on foreign travel increased 27%, during the same period per capita national park visits declined. Are people switching to other more “extreme” forms of outdoor activity, and if so do these people comprise a significant portion of the public? Is a significant portion of increased foreign travel to natural areas in other countries? These questions seem worthy of further research, and the testing of other plausible factors. Perhaps the decrease in national park visits also reflects changing values in the types of outdoor experiences desired: more adventurous, and more exotic.

The fact that median family income was significantly positively correlated with foreign travel but negatively correlated with national park visits was quite interesting. This seems to corroborate economic class disparity in park usage (More, 2000): if families make a lot of money they travel abroad, but if they make less money they visit national parks at home. Are exotic venues, nature based or not, considered more valuable than nature-based experiences closer to home? These variables do not have the statistical significance of the entertainment variables and oil prices, but they likely do have some influence on park visitation.

Rising oil prices mean rising gasoline prices, and rising gasoline prices make it more expensive for people to drive to national parks. The fact that median family income is negatively correlated to park visits may be of some importance here. If families with less money are the ones visiting national parks, changes in oil/gas prices would be expected to have bigger impacts on their decisions to visit national parks than they would on families with more money. It should also be noted that the costs of visiting

parks need to be seen against a backdrop where the costs of all government services are being passed along to users, at a time when many potential users are experiencing declining real incomes.

The fact that peaks in annual individual visits and overnight stays were not reached until well into the 1990s is not consistent with the capacity hypothesis, but it does not completely exclude it. A park might still conceivably show increasing attendance on an annual basis even though it is turning away visitors during peak summer days, were there to be a correspondingly larger increase in “shoulder season” attendance or “off-peak” visits. Or new construction might have (at least temporarily) kept park capacity above demand, a hypothesis somewhat supported by the increase in federal funding noted. Data to test these hypotheses were unavailable to us, and more finely tuned research is needed in both areas. However, even if there still prove to be capacity issues at some of the most popular parks, we feel they would be unlikely to explain the extent of decline in total per capita attendance. Future work will build upon the present ecological analysis with a complimentary economic demand model, based on a cost/demand analysis of national park visits and substitute activities.

We have presented data suggesting that as sedentary recreation choices involving electronic media become more prevalent and the cost of motor vehicle travel rises we may, unfortunately, predict further declines in per capita NPV. If it is indeed true that people have changed their behavior, that they go to national parks less (at least in part) because they are more sedentary and use electronic media more, what does this mean for biodiversity conservation in general? There would seem to be at least two possible biodiversity conservation-related viewpoints. One viewpoint might see declining per capita NPV, and the resulting reduced ecological pressure on our national parks, as being a good thing. An opposing viewpoint might see people’s apparent decrease in ‘biophilia’ and corresponding increase in ‘videophilia’ (which we here define as “the new human tendency to focus on sedentary activities involving electronic media”) as being a very bad thing indeed. Wilson defined biophilia as “the innate tendency to focus on life and lifelike processes,” or the “innately emotional affiliation of human beings to other living organisms” (Wilson, 1984). According to Wilson we humans have an affinity for the natural world that has evolved over millennia and is part of our genes, just like our tendency to be territorial or to protect our young. Kellert (1996) described human cultural learning and experience as exerting a fundamental shaping influence on the content, direction, and strength of people’s nature-related values. Any shift in the value placed on natural areas and experiences will affect the value placed on biodiversity conservation. If we are indeed seeing a fundamental decline in people’s appreciation of (and attachment to) natural areas, the authors feel this does not bode well for the future of biodiversity conservation.

5. Conclusions

The decline in per capita visits to US national parks since 1988 is significantly correlated with several electronic entertainment indicators: hours of television, ($r_s = -0.743$, $P < 0.001$), video games ($r_s = -0.773$, $P < 0.001$), home movies ($r_s = -0.788$, $P < 0.001$), theatre attendance ($r_s = -0.587$, $P < 0.025$) and internet use ($r_s = -0.783$, $P < 0.001$). The decline is significantly negatively correlated with oil prices ($r_s = -0.547$, $P < 0.025$), foreign travel ($r_s = -0.452$, $P < 0.05$), and AT hikers ($r_s = -0.785$, $P < 0.001$). Income was significantly positively correlated with foreign travel ($r_s = 0.621$, $P < 0.005$) but negatively correlated with national park visits ($r_s = -0.697$, $P < 0.005$). There was no significant correlation of mean number of vacation days, indicating available vacation time is probably not a factor. Federal funding actually increased during this period, and so was rejected as a probable factor. Park capacity was rejected as limiting since both total overnight stays and visits at the seven most popular parks rose well into the mid-1990s. Aging of baby boomers was also rejected as they are only now reaching retirement age, and thus during the period of visitation decline were still of prime family vacation age. Multiple linear regression of four of the entertainment media variables as well as oil prices explains 97.5% of this recent decline ($r = 0.975$, multiple $r^2 = 0.950$, adjusted multiple $r^2 = 0.925$, $SE = 0.015$, $F = 37.800$, $P < 0.0001$). We may be seeing evidence of a fundamental shift away from people's appreciation of nature (biophilia, Wilson, 1984) to 'videophilia,' which we here define as "the new human tendency to focus on sedentary activities involving electronic media."

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