

Environmental Concern, Patterns of Television Viewing, and Pro-Environmental Behaviors: Integrating Models of Media Consumption and Effects

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This study merges insights from cultivation and uses and gratifications to examine the relationship between environmental concern, five forms of television viewing, and pro-environmental behaviors. This research considers both the direct effects of various forms of television viewing and their potential mediating roles in the relationship between environmental attitudes and behaviors. Analysis of 1999 and 2000 DDB Life Style Study data reveals that television news and nature documentary use are predicted by environmental concern and contribute to pro-environmental behaviors, whereas three forms of entertainment television use are not consistently linked to these variables. Implications for future research are discussed.

The study of media and the environment is long standing within the field of mass communication, with researchers examining media treatment of the environment from a wide range of epistemological and theoretical perspectives. Empirical studies typically focus on the influence of public affairs content on individual-level environmental knowledge, attitudes, or behaviors (Atwater, Salwen, & Anderson, 1985; Brother, Fortner, & Mayer, 1991; McLeod, Glynn, & Griffin, 1987). Other scholars focus on media and the environment from a cultural perspective, considering a

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broad range of communication content and consequences (e.g., Daley & O'Neill, 1991; Farrell & Goodnight, 1981; Meister, 2001).

To date, the most exhaustive empirical work completed on the relationship between television use and environmental orientations comes from Shanahan, McComas, and colleagues (e.g., McComas, Shanahan, & Butler, 2001; McComas & Shanahan, 1999; Shanahan, 1993; Shanahan & McComas, 1997, 1999; Shanahan, Morgan, & Stenbjerre, 1997). Their studies examine television's portrayal of the environment and the effects of these portrayals on individuals' environmental beliefs and feelings. Their effects studies are typical of cultivation research (e.g., Signorielli & Morgan, 1990), focusing on *total* television use and its relationship to environmental beliefs. Although Shanahan et al. (1997) provide a convincing argument for the utility of a cultivation approach for studying the effects of television use on environmental knowledge and attitudes, empirical support for this perspective in this context is generally mixed. Indeed, Shanahan and Morgan (1999) detail the assumptions about television made by cultivation theory and state that any insights provided by this line of research are in part a function of those assumptions. In short, cultivation is but one approach to the study of television influence.

In response, the present study merges insights from existing cultivation research with media uses and gratifications to examine the dispositional and motivational underpinnings of particular patterns of television viewing *and* the consequences of viewing certain kinds of television content for engaging in pro-environmental behaviors. We contend that research should consider a host of variables, including environmental attitudes, that are exogenous to behavioral variables such as television viewing and social actions. Thus, the perspective advanced by this research considers both the direct effects of various forms of television viewing and their potential mediating roles in the relationship between environmental attitudes and behaviors.

Thus, we expand on research by Shanahan and McComas in four ways. First, we focus on the criterion variable of pro-environmental behaviors. Although the study of media's influence on environmental knowledge and attitudes are important lines of research, most psychological models assert that these variables precede behaviors (McGuire, 1989). Second, we foreground the inherent limitations associated with a focus on total television use (e.g., Hawkins & Pingree, 1981; Potter & Chang, 1990), leading us to attend to individuals' consumption of five different types of television programming (public affairs, nature documentaries, situation comedies, progressive dramas, and traditional dramas).¹ Third, we argue that environmental attitudes and other characteristics can influence patterns of television use. Specifically, we contend that different types of television use support basic psychological dispositions and basic motivations (e.g., Blumler, 1979). We postulate that environmental attitudes, which are central to many individuals' sense of self (Backes, 1995), act as one of many internal motives that determine which types of television programming

individuals consume, and treat environmental concern as antecedent to television use. Finally, we argue that certain forms of television use act as important mediators in the relationship between environmental attitudes and behaviors.

Television and the Environment

Mass communication researchers have focused on the potential influences of various types of television content on individual-level environmental knowledge, attitudes, or behaviors. These works are outlined below, with particular attention paid to the factual (public affairs and nature documentaries) and fictional forms of television programming (dramas and comedies) that are part of this study.

Public Affairs

Studies focusing on the relationship between public affairs media and the environment can be broken down into two distinct areas, content- and effects-based research (Shanahan & McComas, 1999). Several content-based studies focus on how media frame environmental issues (e.g., Dunwoody & Griffin, 1993; Gilbert, 1993; Griffin & Dunwoody, 1997; Luke, 1987), and several other works study the narratives used by journalists when reporting on the environment (e.g., Daley & O'Neill, 1991; Ten Eyck, 1999). For example, Griffin and Dunwoody (1997) find that governmental frames are used more often than scientific frames in the coverage of environmental risks, and that those media organizations in more pluralistic communities are more likely to provide explicit details concerning "threats to human health" (p. 380).

There has also been considerable research focusing on how reporters cover environmental issues. In particular, researchers have focused on what drives coverage of certain environmental issues or incidents by news organizations (e.g., Krinsky & Plough, 1988). Several studies have found that journalists tend to cover specific, dramatic environmental events, most often those with negative consequences; stories about the risks associated with ongoing environmental public policy debates or particular individual-level environmental behaviors receive substantially less coverage. This particular area of study has focused most often on television. Several studies find that coverage of major environmental events often fails to provide adequate scientific detail to place the risks of the event in their proper context, leading some scholars to conclude that television news coverage of the environment is often "more influenced by the dramatic value of a story than by the actual inherent risk in a story" (Shanahan & McComas, 1997, p. 149; see also Barton, 1988; Gorney, 1992; Greenberg, Sachsman, Sandman, & Salomone, 1989).

On the effects side of the news-environment relationship, there have been several

agenda setting studies performed to date (e.g., Ader, 1995; Atwater, et al., 1985). Ader (1995) finds that news attention to pollution influenced public salience about the issue. Atwater et al. (1985) conclude that "when individuals say environmental subissues are personally important to them, those judgments are not made independent of perceptions of media representations" (p. 397). In addition, Brothier et al. (1991) find a relationship between television news coverage of the environment and individual-level knowledge of environmental issues. In short, there is a strong relationship between coverage of environmental issues by news organizations and individual-level knowledge and attitudes about this subject matter.

Particularly important for this study, research by McLeod et al. (1987) found public affairs media use was a strong predictor of environmental issue salience, but that the effects of this type of media use had less of an impact on environmental behaviors. In addition to the study of general public affairs media use, McLeod et al. also studied the influence of environment-specific media use, and found once again that this type of media use yielded a strong positive relationship with environmental issue salience but not on actual behaviors. More recently, Krendl, Olson, and Burke (1992) found in their study of the role of media in a broader environmental campaign that forms of mass communication can have a direct positive effect on environmental behaviors.

Nature Documentaries

Content-based summaries of nature television shows sponsored by the Audubon Society and other environmental organizations describe programs that emphasize "the positive impact people can have on their natural resources" (Wallace, 1987, p. viii). These types of shows often present natural habitats relatively undisturbed by humans and stress the importance of trying to maintain these environments over the long term. Nature is often revealed for its own beauty in these programs and narrators provide detailed information about how these landscapes evolved over time (see Brown & Pettifer, 1985). Many of these programs also stress the importance of environmental stewardship by current generations. These programs exemplify the "think globally, act locally" philosophy. By promoting awareness about environmental issues that are worldwide in scope, they convey how local actions can affect distant habitats.

The proliferation of cable television has brought a rise in the number of outlets showing nature documentaries, and with this increase has also come larger audiences (McElvogue, 1997; Robinchaux, 1995). Recent documentary series like *The Blue Planet: Seas of Life* present images of areas of the world relatively untouched by humans (Henderson & Lomasney, 2002; Stratchan, 2002). Overall, the thematic and generally positive messages found in most nature documentaries contrast sharply with the environmental content typically found in news, with its over-dramatization of episodic environmental events.

Prime-Time Entertainment Television

McComas et al. (2001) provide a detailed analysis of the presentation of environmental issues on prime-time entertainment television. These researchers collected prime-time entertainment television content on the major networks for the years 1991 through 1997, and analyzed this content for the presence of environment-related episodes (see Shanahan & McComas, 1997, p. 151, for definition of an environmental episode). They find environmental issues are "relatively infrequent" in prime-time entertainment programs, with 46% of these episodes "neutral" and another 13% "unconcerned" about the environmental issues being raised in the programs. Only 40% of the environmental episodes were defined as expressing some sort of "concern" for the environment. Once again, this stands in stark contrast to the stories about the environment being told via public affairs television or nature documentaries.

The differences in intensity and valence in the environmental messages being sent by factual versus fictional television programs may provide some insight as to why studies relying on cultivation theory and measures of total television generally yield mixed results (e.g., Shanahan et al., 1997; Shanahan & McComas, 1999). If various forms of television programming are sending different messages about the environment, and they imply varied levels of concern when discussing environmental issues, then they will likely attract different audiences and have different consequences.

Television Use as Mediator

Many of the studies outlined above speak to a set of direct relationships between various forms of television viewing and individual-level environmental knowledge, attitudes, or behaviors. However, there may be a second route by which various types of media use affect pro-environmental behaviors. Media scholars have long understood that many demographic, situational, and orientational variables shape patterns of television use in a cycle of gratifications sought and attained (e.g., Palmgreen, 1984). Particularly important for this study, research indicates that the deeper motivations implicit in these social traits may lead individuals to consume media content that reflects their self-perceptions, views, and goals (McQuail, 1985). Accordingly, research has focused on the surveillance and personal identity functions of media use (Blumler & Katz, 1974). From this perspective, individuals use media to understand the world around them and their role within it. Thus, research must consider the possibility that these variables work through media use to influence a wider range of behavioral variables (e.g., Shah, McLeod, & Yoon, 2001).

One motivational variable of particular interest to this study is the attitudinal measure of environmental concern. Environmental attitudes can serve as one of many motivational factors shaping who watches what types of television programming. Those who show a concern for the environment will most likely consume

programs that share their outlook and provide some information relevant to their concerns. Although levels of environmental concern may be influenced in some way by various forms of television use, we argue that this attitudinal measure is well situated as pre-existing the behavioral measure of television use.

As a result of the causal sequence of environmental attitudes-to-television use-to-environmental behaviors established for this study, we believe it is important to analyze the mediating role of various forms of television use in the relationship between the pre-existing attitudinal measure of environmental concern and pro-environmental behaviors. This also has the virtue of creating a very strict test of media effects. That is, the influence of media variables will be tested on behavioral outcomes only after accounting for the effects of individuals' levels of environmental concern. Although past research has overwhelmingly focused on the influence of television on environmental knowledge and attitudes, we argue: (1) that environmental attitudes can influence patterns of television use, and (2) that particular patterns of television use act as mediators between environmental attitudes and behaviors. Studying the potential mediating role of television use may provide the basis for an integrated model of media consumption and effects bridging past insights from cultivation research with a media uses and gratifications perspective.

This approach is consistent with the adoption of O-S-O-R models of communication influence in political communication research (McLeod, Kosicki, & McLeod, 2002). The introduction of orientations (the two O's) to the traditional stimulus (S) - response (R) model reflects an understanding among media scholars that a wide range of structural, cultural, motivational, and cognitive factors influence patterns of media consumption, audience reception, and message processing. As such, the individual is seen as an active agent in this model, consistent with work in social cognition that focuses on the personal and social orientations individuals bring to conscious interactions (e.g., Markus & Zajonc, 1985). Understanding what dispositions lead individuals to specific interactions with media (e.g., genres of television consumption), and the influence of these interactions on their social responses (e.g., adoption of pro-environmental behaviors), merges theories of media consumption and effects, and as such acknowledges the multiple roles that media play in individuals' lives.

Hypotheses and Research Questions

Based on extant research and our theoretical arguments, we posit the following hypotheses regarding the relationships among environmental concern, public affairs television use, nature documentary use, and pro-environmental behaviors:

H1: Environmental concern will positively predict public affairs television use.

H2: Environmental concern will positively predict nature documentary use.

H3: Environmental concern will positively predict pro-environmental behaviors.

H4: Public affairs television use will be a unique positive contributor to pro-environmental behaviors, beyond the influence of environmental concern.

H5: Nature documentary use will be a unique positive contributor to pro-environmental behaviors, beyond the influence of environmental concern.

H6: Public affairs and nature documentary television use will serve as important mediators in the relationship between environmental concern and behaviors.

Given the disparate findings associated with past empirical research concerning the relationship between prime-time entertainment television and the environment, the following research questions are presented:

RQ1: What are the relationships between environmental concern and various forms of prime-time entertainment television use?

RQ2: What are the relationships between various forms of prime-time entertainment television use and pro-environmental behaviors?

RQ3: What roles do various forms of prime-time entertainment use play as mediators in the relationship between environmental concern and environmental behaviors?

Method

Survey Data

The data used in this study were collected as part of an annual mail survey, conducted by Market Facts and funded by DDB-Chicago, an international marketing communications company. In an effort to achieve a balanced final sample, a starting sample of approximately 5,000 mail panelists is adjusted within the subcategories of race, gender, and marital status to compensate for expected differences in return rates (1999, $N=3,388$, response rate = 67.8%; 2000, $N = 3,122$, response rate = 62.4%). Weights are then applied to each respondent to match the demographic make-up of the population (Putnam & Yonish, 1999). This process allows the sample to approximate actual distributions within the U.S. Census for income, population density, age, and household size (Groeneman, 1994). All question wordings are identical across the two data sets.

Measures

Endogenous variables. First, we constructed our criterion variable of pro-environmental behaviors. This variable consists of three items, each measured on a six-point scale from "I definitely disagree" to "I definitely agree." Each respondent was asked

to respond to the following three statements: "I make a special effort to look for products that are energy efficient," and "I try to buy products that use recycled packaging," and "I make a strong effort to recycle everything I possibly can." The three observed measures form a reliable index (1999, $\alpha = .65$, avg. inter-item $r = .374$, $p < .001$; 2000, $\alpha = .63$, avg. inter-item $r = .357$, $p < .001$).²

Multiple measures for television entertainment viewing were created from a total of 13 dichotomous items measuring the use of specific programs. Exploratory factor analyses (Principle Axis, OBLIMIN) conducted independently for each survey revealed three consistently articulated factors: Situation comedies (*Friends*, *Frasier*, *Third Rock from the Sun*, *Dharma and Greg*, *Drew Carey*, *Everybody Loves Raymond*; 1999, $\alpha = .67$; 2000, $\alpha = .69$), progressive dramas (*NYPD Blue*, *ER*, *Law & Order*, *Chicago Hope*; 1999, $\alpha = .63$; 2000, $\alpha = .65$), and traditional dramas (*Touched by an Angel*, *Promised Land*, *Walker, Texas Ranger*; 1999, $\alpha = .62$, avg. inter-item $r = .354$, $p < .001$; 2000, $\alpha = .59$, avg. inter-item $r = .323$, $p < .001$). Each of these forms of prime-time entertainment television use has been shown to have individual-level effects in the socio-political arena (Holbert, Shah, & Kwak, 2003).

A single index was formed to create public affairs television use. This index consists of three dichotomous television use items: local television news, national television news, and news interview programs (1999, $\alpha = .62$, avg. inter-item $r = .349$, $p < .001$; 2000, $\alpha = .63$, avg. inter-item $r = .358$, $p < .001$). We also included a single dichotomous measure of television nature documentary use.

The final endogenous variable is an attitudinal measure of individual-level environmental concern. The study of the relationship between environmental concern and environmental behaviors is a well-established line of research (e.g., Diekmann & Preisendorfer, 1998). Individual-level perceptions of environmental concern focus on the immediate influences of the environment on oneself and those most immediate to oneself (Axelrod & Lehman, 1993). This is a single-item measure where respondents were asked to rate on a six-point scale their level of agreement or disagreement with the following statement: "I worry a lot about the effects of environmental pollution on my family's health."

Exogenous variables. We included the standard set of four demographic variables: Age, sex, education, and income. Each of these demographic variables has been shown to be a predictor of environmental behaviors, but the findings are mixed across studies (for summary, see Olli, Grendstad, & Wollebauk, 2001). In addition to these controls, we also included a dichotomous demographic variable of race (African-American coded high). The study of "environmental racism" is an ever-expanding line of research (e.g., Camacho, 1998), and special attention has been given to the plight of African-Americans and the lack of environmental pollution controls in the inner-city areas they often inhabit.

We also included two contextual variables in the exogenous portion of our regression equations: home ownership and population density. Home ownership is a dichotomous measure (Own home coded high). Population density is a seven-item measure constructed from U.S. Census data. Several researchers have studied the

influence of home ownership on environmental conditions of neighborhoods (e.g., Arblaster & Hawtin, 1993), and there has also been work on the influence of the urban versus rural dichotomy on a range of matters pertaining to the environment (e.g., Jones, Fly, & Cordell, 1999; Van Liere & Dunlap, 1980).

Finally, we included a single orientation variable, ideology. This item was measured with a single response to a five-point scale, "Generally speaking, would you consider yourself to be . . .," with the scale ranging from "very conservative" to "very liberal." Recent work reinforces the argument that support for environmental policies falls along ideological lines (e.g., Shipan & Lowry, 2001).

Analyses

Our analyses consist of three components. First, OLS regression path analysis was used to test an identical model for each year, 1999 and 2000. The eight demographic, situational, and orientational variables were entered in a first block, followed by a second block consisting of the single attitudinal measure of environmental concern. The five forms of television use first served as dependent variables. Following this, they were entered simultaneously in a third block, with pro-environmental behaviors as the criterion variable.

Second, each form of television use found to be a significant predictor of pro-environmental behaviors in the path analyses was entered separately in a block after all other variables in each equation. The incremental R^2 statistic was used to formally test whether the various forms of media use retained a unique relationship with the criterion variable beyond that which had already been established by the other variables in the equation.

Third, we used a stringent method for replication assessment outlined by Rosenthal (1991) to formally cross-validate our results across the two data sets. Rosenthal argues against judging the success of a replication in a dichotomous fashion based on the emergence of similar statistical significance levels. Instead, he contends that researchers should make a final judgment concerning a replication's success along a continuum and via a comparison of effect sizes. As noted by Jegerski (1991), "the abandonment of the p -value for comparing replications is appropriate and long overdue" (p. 37). Accordingly, the tests for the incremental R^2 s served as the assessment tool for the merit of our replication (for conversion equations, see Rosenthal, 1984).

Results

Predictors of Fact-Based Television Use

The regression equations containing the nine predictors of the two forms of factual-based television use (i.e., public affairs and nature documentary) provide a firm understanding of who is turning to these different types of programming (see

Table 1). There are three consistent predictors of television public affairs use across the two surveys: age (1999: $\beta = .36$; 2000: $\beta = .39$), race (1999: $\beta = .07$; 2000: $\beta = .08$), and environmental concern (1999: $\beta = .05$; 2000: $\beta = .09$). Those who are older and African-American watch more television news when all other factors are held constant. It is important to note that the attitudinal variable of environmental concern is among the strongest predictors of public affairs television use, suggesting that those who are concerned about the potential of harmful environmental consequences turn to television for their news and information. Thus, H1 was confirmed.

There are three consistent predictors of nature documentary viewing: age (1999: $\beta = .09$; 2000: $\beta = .06$), sex (1999: $\beta = -.06$; 2000: $\beta = -.08$), and environmental concern (1999: $\beta = .06$; 2000: $\beta = .11$). Those who are older and male turn to this type of programming more often than others, holding all other factors constant. In addition, the environmental attitude variable is a strong and consistent predictor. Those who have a greater concern for the potential harmful effects of the environment tune in to watch nature documentaries more frequently. Thus, H2 was confirmed.

Predictors of Fiction-Based Television Use

Situation comedy use is predicted consistently by five variables in both surveys: age (1999: $\beta = -.20$; 2000: $\beta = .21$), population density (1999: $\beta = .04$; 2000: $\beta =$

Table 1
Predictors of Factual-Based Television Use

	Public Affairs		Nature Documentaries	
	1999	2000	1999	2000
Exogenous Variables				
Age	.36***	.39***	.09***	.06**
Sex (Female)	.05**	.01	-.06**	-.08***
Education	.00	.02	-.02	-.04
Income	.02	.01	-.04*	-.03
Population Density	-.02	-.04*	-.01	-.01
Ideology (Liberal)	.00	.00	.04*	.02
Race (African-American)	.07***	.08***	-.05*	-.03
Own Home (Own Home)	.02	.00	.00	-.01
Attitudinal Variable				
Environmental Concern	.05***	.09***	.06***	.11***

Notes: Coefficients are final standardized Beta's (β). * $p < .05$, ** $p < .01$, *** $p < .001$. Television Public Affairs: 1999, R^2 (%) = 13.8*** for Block 1; ΔR^2 (%) = 0.2** for Block 2, $N = 3166$; 2000: R^2 (%) = 15.3*** for Block 1; ΔR^2 (%) = 0.7*** for Block 2, $N = 2857$. Nature Documentaries: 1999, R^2 (%) = 1.6*** for Block 1; ΔR^2 (%) = 0.3*** for Block 2, $N = 3166$; 2000: Total R^2 (%) = 1.3*** for Block 1; ΔR^2 (%) = 1.2*** for Block 2, $N = 2857$.

.05), ideology (1999: $\beta = .07$; 2000: $\beta = .10$), race (1999: $\beta = -.14$; 2000: $\beta = -.09$), and environmental concern (1999: $\beta = .04$; 2000: $\beta = .05$). Those who are older and African-American tend to shy away from the situation comedies that form our index. Those who live in more urban areas, are more liberal, and share a heightened sense of environmental concern turn to this type of programming more often (see Table 2). In response to the first research question, it is notable that environmental concern is a consistent predictor of this form of television use. Although we have introduced an extensive list of variables into the exogenous portion of our models, this relatively weak relationship may be due to one or more variables unaccounted for that simultaneously influence both environmental concern and this form of prime-time television use.³

There are only two variables that are significant predictors of progressive drama viewing across the two surveys: sex (1999: $\beta = .10$; 2000: $\beta = .10$) and race (1999: $\beta = .05$; 2000: $\beta = .09$). By contrast, there are seven very strong and consistent predictors of traditional drama viewing, with age (1999: $\beta = .20$; 2000: $\beta = .21$)

Table 2
Predictors of Prime-Time Entertainment Television Use

	Situation Comedy		Progressive Drama		Traditional Drama	
	1999	2000	1999	2000	1999	2000
Exogenous Variables						
Age	-.20***	-.21***	-.01	.04*	.20***	.21***
Sex (Female)	.05**	.01	.10***	.10***	.13***	.10***
Education	.01	-.02	-.04*	.01	-.12***	-.09***
Income	.00	-.01	.03	.00	-.12***	-.13***
Population Density	.04*	.05**	.04*	.02	-.06***	-.07***
Ideology (Liberal)	.07***	.10***	.02	.04*	-.08***	-.10***
Race (African-American)	-.14***	-.09***	.05**	.09***	.09***	.10***
Own Home (Own Home)	-.00	.02	.00	-.02	.03	.04
Attitudinal Variable						
Environmental Concern	.04*	.05*	.03	.05**	.00	.04*

Notes: Coefficients are final standardized Beta's (β). * $p < .05$, ** $p < .01$, *** $p < .001$. Situation Comedy Use: 1999, R^2 (%) = 6.7*** for Block 1; ΔR^2 (%) = 0.1* for Block 2, $N = 3166$; 2000, R^2 (%) = 6.2*** for Block 1; ΔR^2 (%) = 0.2* for Block 2, $N = 2857$. Progressive Drama Use: 1999, R^2 (%) = 1.7*** for Block 1; ΔR^2 (%) = 0.1 for Block 2, $N = 3166$; 2000, R^2 (%) = 2.5*** for Block 1; ΔR^2 (%) = 0.3** for Block 2, Traditional Drama Use: 1999, R^2 (%) = 13.6*** for Block 1; ΔR^2 (%) = 0.0 for Block 2, $N = 3166$; 2000 R^2 (%) = 13.4*** for Block 1; ΔR^2 (%) = 0.2* for Block 2, $N = 2857$.

retaining the strongest relationship with this type of television use. More important for this paper, environmental concern is not a consistently significant predictor of either form of television drama use.

Predictors of Pro-Environmental Behaviors

Four of the exogenous variables have strong direct effects on pro-environmental behaviors: age (1999: $\beta = .17$; 2000: $\beta = .20$), sex (1999: $\beta = .12$; 2000: $\beta = .12$), education (1999: $\beta = .15$; 2000: $\beta = .10$), and race (1999: $\beta = -.05$; 2000: $\beta = -.07$). Those who are older, female, better educated, and non-African-American tend to adopt more pro-environmental behaviors. The attitudinal measure of environmental concern is by far the strongest predictor of pro-environmental behaviors (1999: $\beta = .39$; 2000: $\beta = .35$), confirming H3 (see Table 3).

Two of the five television use variables are significant predictors of pro-environmental behaviors, public affairs (1999: $\beta = .05$; 2000: $\beta = .05$) and nature

Table 3
Predictors of Pro-Environmental Behaviors

	Pro-Environmental Behaviors	
	1999	2000
Exogenous Variables		
Age	.17***	.20***
Sex (Female)	.12***	.12***
Education	.15***	.10***
Income	-.02	.02
Population Density	.01	.02
Ideology (Liberal)	.00	.01
Race (African-American)	-.05**	-.07***
Own Home (Own Home)	.04*	.03
Attitudinal Variable		
Environmental Concern	.39***	.35***
Television Use		
Public Affairs	.05**	.05**
Nature Documentaries	.04**	.05**
Situation Comedies	.00	.01
Progressive Dramas	-.02	-.01
Traditional Dramas	.00	-.01

Notes: Coefficients are final standardized Beta's (β). * $p < .05$, ** $p < .01$, *** $p < .001$. 1999, R^2 (%) = 8.1*** for Block 1; ΔR^2 (%) = 15.2*** for Block 2, ΔR^2 (%) = 0.5** for Block 3, $N = 3119$; 2000, R^2 (%) = 8.4*** for Block 1; ΔR^2 (%) = 12.5*** for Block 2, ΔR^2 (%) = 0.6*** for Block 3, $N = 2825$.

documentaries (1999: $\beta = .04$; 2000: $\beta = .05$). In short, there is a clear positive direct relationship between fact-based television use and individual-level environmental activities. Entering both of these variables into a separate final block for respective regression equations produces significant incremental R^2 statistics: Public affairs (1999: Incr. R^2 (%) = 0.3; 2000: Incr. R^2 (%) = 0.2); nature shows (1999: Incr. R^2 (%) = 0.3; 2000: Incr. R^2 (%) = 0.3). This combination of results confirms H4 and H5. Both of these forms of television use contribute in unique positive ways to pro-environmental behaviors, above and beyond the influence of a host of demographic, contextual, and various television use variables, as well as the attitudinal measure of environmental concern. However, we must also recognize that these effects are relatively small in terms of their overall variance accounted for.

Notably, the three forms of fictional-based television use were not found to retain a significant direct relationship with pro-environmental behaviors. Thus, the second research question produced little in terms of significant results. This pattern of results falls in line with the content analysis completed by McComas et al. (2001) on prime-time entertainment television, indicating that the environment is discussed infrequently in this type of programming content and then only in a largely neutral or unconcerned manner.

Replication

Given that the two forms of factual-based television use were significant contributors to pro-environmental behaviors across both data sets, we wanted to cross-validate these results to confirm that the effects are consistent across time (Rosenthal, 1991). The effects sizes for public affairs television use (1999: $r = .06$, $z = 2.90$; 2000: $r = .05$, $z = 2.40$) are consistent across the two years, and the same can be said for nature documentary use (1999: $r = .06$, $z = 2.90$; 2000: $r = .06$, $z = 2.90$). Thus, we have a full replication of two direct effects of factual-based television use on pro-environmental behaviors. This provides further support for H4 and H5.

Television Use as Mediator

Given that there is almost no direct influence of the three forms of fiction-based television use on pro-environmental behaviors (research question #3), there are only two routes through which media use can mediate the effects of pre-media use variables on pro-environmental behaviors—through the two forms of fact-based television use, public affairs and nature documentaries. Thus, we only examine the potential mediating role of these two forms of television use, focusing on relationships that are consistent across the two years. We consider the general patterns of mediation and discuss how the indirect effects through these two forms of media use

function relative to the direct effects of the pre-media use variables on pro-environmental behaviors.

First and foremost, age was found to have a strong positive influence on both television public affairs use and nature documentary use, and both of these forms of television use were strong positive predictors of pro-environmental behaviors. This combination of paths creates two positive indirect effects of age on pro-environmental behaviors. These positive indirect effects add to the already strong positive direct effect of age on pro-environmental behaviors, creating a stronger total effect when viewing the model as a whole (analysis not shown).

Two other exogenous predictors, race and sex, found to have significant direct effects on pro-environmental behaviors were also found to have significant indirect effects through television use. Race negatively predicted pro-environmental behaviors. However, this demographic variable was a positive predictor of television public affairs use, which in turn positively predicted pro-environmental behaviors. Thus, the indirect effect of race through public affairs is positive, running counter to its negative direct effect on the criterion variable. In other words, use of public affairs television by African-Americans serves to weaken the negative direct effect of being African-American on taking part in environmental activities. This finding reveals that television news may provide African-Americans with information and resources that encourage being environmentally conscious in one's daily routine.

In contrast with this mediated relationship, females are more likely to take part in pro-environmental behaviors. However, they are less likely to watch nature documentaries, which has a positive influence on the criterion variable. Thus, the negative indirect effect of sex through nature shows runs counter to the positive direct effect of this variable on pro-environmental behaviors. In short, some of the indirect effects that are created by factual-based television use acting as mediators can serve to enhance the direct effect of an exogenous variable on pro-environmental behaviors, while in other instances the indirect effects run counter to the significant direct effects that exist in the model.

The mediating relationships of greatest interest to this study are those that exist between the attitudinal measure of environmental concern and pro-environmental behaviors. Environmental concern is a strong positive predictor of both public affairs television and nature show use across both surveys. These paths, in tandem with the positive influences of both of these forms of factual-based television use on the criterion variable, create a strong set of positive indirect effects of environmental concern on pro-environmental behaviors. This confirms H6. These indirect effects reinforce the already substantial positive direct effect of this attitudinal measure on the behavioral measure. Thus, public affairs and nature show use not only have positive direct effects on pro-environmental behaviors, but they serve as important mediators between environmental attitudes and behaviors to create a strong total positive effect of the former on the latter. This is an important set of effects that detail

an additional role played by factual-based television use beyond the study of direct effects (Holbert & Stephenson, 2002).

Discussion

There is a clear differentiation between the direct effects of factual- versus fictional-based television use on pro-environmental behaviors, with factual-based television use (i.e., public affairs and nature-based programming) being a significant positive predictor of the criterion variable. The use of television news, even with its episodic and overly dramatic coverage of the environment, has a positive influence in creating a greater desire within individuals to recycle, purchase products that are environmentally friendly, and being more energy efficient in their daily routines. The same can be said for the influence of the viewing of nature documentaries, programs that often provide a discussion of our responsibilities as stewards of the environment.

However, it is also important to recognize that although the effects of these two forms of factual-based television use have similar direct effects on pro-environmental behaviors, content-based studies of these two genres reveal that the messages being sent about the environment are quite different across these venues. When public affairs television presents environmental issues, these stories are most often about environmental disasters that are relative anomalies. Perhaps the influence of public affairs television use on pro-environmental behaviors stems in some measure from an affective element of fear that we all need to do better in terms of being environmentally conscious, not a purely cognitive information-transmission effect. Nature programming may also retain an affective influence on viewers, but it is most likely that the valence of this affect runs counter to that produced by public affairs television use. Nature documentaries do present a very positive message about the environment that every effort put forward by responsible citizens aids in keeping our world a little cleaner. It is not surprising that fiction-based forms of television use did not have a direct effect on the criterion variable given that McComas et al. (2001) found that a large percentage of this programming does not raise environmental issues. In addition, when environmental issues are raised by prime-time entertainment television, either a neutral stand or complete apathy toward the environment appear to be the messages being communicated to viewers.

These distinct patterns of effects underscore our argument that it is important to focus on different types of television use. We not only found a distinction between factual- and fictional-based television use, we also argue that the similar effects that stem from the two forms of factual-based television use most likely originate from different messages being sent to viewers. These are important distinctions that can only be assessed by studying different types of television use simultaneously. Cultivation studies provide mass communication scholarship with a certain type of understanding of the relationship between television viewing and how individuals come to understand the world and their place within that world. However, studies of

multiple forms of television viewing can provide additional insights that can enhance or complement these works. Our research recognizes that individuals consume media to address a range of motives and that these motives may shape patterns of media consumption. Combining this perspective with previous insights offered via a cultivation approach to television yields a model that bridges theories of media consumption and effects. We believe this approach is consistent with existing O-S-O-R models that weave together an elaborate assortment of variables to better understand multiple media roles while placing these influences in their proper context (e.g., McLeod et al., 2002).

This study was also able to identify several important influences of public affairs and nature documentary use as mediators. The positive influence of age on pro-environmental behaviors was enhanced as a result of the two positive indirect effects that work through the factual-based forms of television use. In contrast, the indirect effects of sex and race run counter to their direct effects on pro-environmental behaviors, presenting a far more complex picture surrounding the true role of various forms of television use on the criterion variable. Environmental concern had a larger positive direct effect with the criterion variable, but the total positive effect of this attitudinal variable is even larger as a result of the indirect effects that run through public affairs and nature documentary television use. These important mediating relationships for the factual-based forms of television use serve to enhance our understanding of the relationship between television and the environment.

The approach taken in this work on the environment is applicable to analyses of a host of other relationships between television use and various socio-political attitudes/behaviors. Previous work in this same line of research has focused on issues concerning women's rights (Holbert et al., 2003), and we argue that future research should focus on a number of other policy areas as well. Some of these areas could include crime, race, and gay rights. It is important that different types of television use be focused upon relative to attitudes and behaviors surrounding these issues, and that we not only focus on the direct effects of television viewing but the role of television use as a potential mediator as well. We intend to expand the approach used in this study to these other areas and encourage other scholars to do the same.

It is important that we outline the limitations of this study. First, we must acknowledge some general weaknesses in the measures used in this secondary analysis. The individual television use measures employed for this study are dichotomous, and the effects of these variables are likely suppressed due to the weaknesses of this type of measurement (Cohen & Cohen, 1983). There must also be recognition of the skewed sample of programs used to form the situation comedy use index. Recent reports have shown there to be a severe racial segregation of the prime-time television audience, and this is especially true for situation comedies (Mfume, 2001). Based on these reports, our situation comedy index would appeal to a largely Caucasian audience.

Also, our measure of environmental concern consists of a single item. This complex concept deserves to be better explicated, resulting in a stronger, multiple-

item index to be used in future studies. The generalizability of our study is also hindered slightly by the set of three environmental behaviors that comprise our criterion variable. These three behaviors deal with common daily activities, while other studies often focus on other types of behaviors (e.g., McLeod et al., 1987). It is important that future research in this area attempt to overcome some of the weaknesses inherent to our measures.

Finally, special attention must be paid to inferring causation from cross-sectional data (e.g., Cliff, 1983). Although we have constructed a model that clearly progresses from the attitudinal to the behavioral, a panel design would allow us to be more resolute in our discussion of clear causal distinctions. We hope that future research will continue to study the relationship between television use and environmental behaviors, and that these works will seek to improve on the secondary analyses performed for this study.

Notes

¹ Shanahan and Morgan (1999) state that cultivation "approaches television as a *system* of messages" (p. 5). Thus, total viewing is an appropriate measure that matches well with this theory's assumptions and unique perspectives concerning television. However, they also recognize that different television use measures may better serve different approaches to the study of this form of mass communication.

² Given the adverse influence of a low number of items on Cronbach's alpha (e.g., Carmines & Zeller, 1979), we report the inter-item correlations for all indices containing three or fewer items.

³ We attempted to introduce several other variables into the exogenous portion of the regression equations (e.g., have children, economic outlook), but none of these additional variables were able to shed greater light on the relationship between environmental concern and situation comedy viewing.

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