

NON-CONSUMPTIVE OUTDOOR RECREATION, ACTIVITY MEANING, AND ENVIRONMENTAL CONCERN

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Abstract: Many have hypothesized and intuited a relationship between participation in outdoor recreation and concern about the state of the environment. It is believed that participating in outdoor recreation can influence environmental concern by exposing people to specific instances of environmental degradation and increasing their concern about such degradation on a broader scale. Research examining this phenomenon has found moderate to weak support for a direct connection between outdoor recreation participation and environmental concern. Using structural equation analysis, we examined whether the meaning of non-consumptive outdoor recreation to recreationists mediated the relationship between non-consumptive outdoor recreation participation and environmental concern. A mail-back survey of Washington State residents (n = 900) found that outdoor recreation meaning was a better predictor of environmental concern than measures of participation. However results also suggest that the relationship between environmental concern and the meaning of non-consumptive outdoor recreation was not a particularly strong one and that meaning is likely one of many factors that might influence environmental concern.

Introduction

In the 1960s, environmental quality emerged as a major social concern in our society. Peaking with the first Earth day in 1970, environmental concern saw a gradual decline during the 1970s. Since then, concern for the environment has enjoyed a

significant increase, reaching unprecedented levels in the 1990s (Dunlap 1992). For example in 1990, 40% of American households contained someone who either donated to or was active in a group that worked to protect the environment; up from 15% in 1987. In the early 1990s, three-fourths of the public perceived themselves as environmentalists (Gallup and Newport 1990). Subsequent studies have reported that at least 70% of the public perceives themselves as "environmentalists" (Kempton, Boster, and Hartley 1995).

An important factor in the increased public awareness of and concern about environmental issues may be the growth of outdoor recreation that has occurred since World War II. With growing urbanization, outdoor recreation is the primary connection that many Americans have to the natural environment. Participating in outdoor recreation can influence one's conservation ethic by exposing people to instances of environmental degradation where they recreate and increasing their concern about such degradation on a broader scale. While this relationship makes intuitive sense, research results have been mixed. Dunlap and Heffernan (1975) found that participation in non-consumptive activities (e.g. backpacking, wildlife viewing, and nature study) was related to concern for the environment. Other research, however, has found only moderate or weak correlation between outdoor activity and environmental concern (Van Liere and Noe 1981; Jackson 1987; Theodori, Luloff, and Willits 1998). It is apparent that the connection between outdoor recreation participation and environmental concern is more complex than originally thought.

The relationship between non-consumptive outdoor recreation participation and environmental concern may be clarified by taking into account the nature of outdoor recreation participation. By the nature of outdoor recreation, we mean going beyond merely analyzing the activities that individuals engage in, to examining the underlying meanings those activities hold for people. Since the same activity may mean something different for two individuals, it is reasonable to suspect that differences in meaning may contribute to the ambiguous findings about the relationship between outdoor recreation and environmental attitudes.

We examined the extent to which the meaning of a non-consumptive outdoor recreation activity provides a better explanation or prediction of environmental concern than participation. We hypothesized that the direct relationship between non-consumptive outdoor recreation participation and environmental concern will be mediated by the meaning of the non-consumptive outdoor recreation activity.

Previous Research on Outdoor Recreation and Environmental Concern

Dunlap and Heffernan (1975) hypothesized that a positive relationship between environmental concern and outdoor recreation participation existed. However, their study found a weak relationship between these two factors. Activities were generally associated with concern for protection of forest and natural areas but associations weakened as the study examined more broad scale issues such as pollution control from various sources. They also found that participation in nature appreciative activities was associated with environmental concern. Re-examining the Dunlap and Heffernan (1975) hypotheses, Geisler, Martinson and Wilkening (1977) found no significant relationship between activities and concern. They concluded, "It may be individual characteristics rather than recreational habits which account for most of the environmental concern..." (p. 247). Reasons for engaging in an activity, or meaning, might represent these characteristics.

Several similar studies followed these initial examinations. Pinhey and Grimes (1979) noted that although participants in outdoor recreation activities exhibited slightly more concern than non-participants, the hypothesis that activity participation was related to increased concern was not supported. Thus, the findings of their studies support Geisler's et al (1977) assertion that little or no relationship exists between activity and concern. Van Liere and Noe (1981) found only a weak relationship between environmental attitude and activity and concluded that a more complex relationship may exist between outdoor recreation and environmental attitude. Van Liere and Noe postulated that social factors arising from specialization in an activity lead a user from consumptive to appreciative behavior and "give an activity meaning." (p.513).

Results of other studies supported the Dunlap-Heffernan thesis that outdoor recreation activity is related to environmental concern. Jackson (1986) found that outdoor recreation users who engaged in appreciative recreational activities exhibited a higher degree of pro-environmental attitudes than did those who chose consumptive activities. However, none of the correlations reported were, in the author's words, "particularly large" (p. 19). The researchers did conclude that there was a stronger relationship between the outdoor recreation activity engaged in and attitudes toward protection of the resources necessary for engaging in the activity than between the activity and more general environmental attitudes. Theodori, Luloff, and Willits (1998) also identified a positive relationship between pro-environmental behavior and outdoor recreation activity.

Taking results of previous research together, there is a lack of consensus with respect to the relationship between recreation participation and environmental concern. Even studies that support the relationship do so with mixed or weak results. In addition, a number of studies disconfirm the hypothesis that outdoor recreation behavior is positively related to environmental concern. Our study sought to determine if the meaning of the non-consumptive outdoor recreation activity is a more important factor in influencing the relationship between activity and environmental concern.

Data and Methods

Sampling and Questionnaire Administration

Two methods were used to select samples of Washington state residents. First a private sampling firm provided a random sample of the names, addresses, and telephone numbers of 1000 residents of the state of Washington. Second, given that less than one-fifth of the US population over 16 years old participate in hunting (7%) or fishing (19%) (Statistical Abstract of the United States 1994, internet source), we randomly selected 1000 names, addresses, and telephone numbers from Washington state hunting and fishing licenses held at the Washington Department of Fish and Game. Steps were taken to ensure that an individual was not included in both samples.

A mail-back questionnaire was sent to potential respondents. After 10 days, a postcard was sent to those who had yet to respond. The postcard was

followed 10 days later by a second questionnaire. Of the 2000 questionnaires mailed, 364 were undeliverable and 900 were returned (55.0% return rate). Telephone contact of 50 nonrespondents found no significant differences in outdoor recreation participation between respondents and nonrespondents.

Factor Measurement

The mail-back questionnaire measured participation in outdoor recreation activities, the meaning of those activities to the individual, and environmental concern.

Non-consumptive outdoor recreation participation

Respondents were provided with a list of 35 outdoor recreation activities and asked to indicate which they had participated in at least one time within the previous 3 years using a binary scale (0 = didn't participate, 1 = participated). Respondents could check all applicable activities. Respondents were then asked to indicate the three outdoor recreation activities that were most important to them. After identifying the outdoor recreation activities most important to them, respondents' indicated their experience history in each of the three activities by estimating how long (in years) they had been participating in that activity and how often (times per year).

To compute recreation participation, responses to the experience history questions were standardized and the mean of the two items were calculated. The mean was multiplied by the dichotomous (0 or 1) participation variable, creating a non-consumptive outdoor recreation participation variable for each of the three activities deemed to be most important. Prior to addressing the study objectives, the principal component method of factor analysis and varimax rotation was applied to the measures of participation in each outdoor recreation activity. This simplified analysis by creating fewer activity categories.

Outdoor recreation meaning. Outdoor recreation meaning was measured as recreation experience preferences. Items used were based on the meta-analysis of motivations by Manfreda, Driver, and Tarrant (1996). Respondents were asked to think about the important recreation activities already identified and indicate how important each of 45 recreation experiences was when participating in

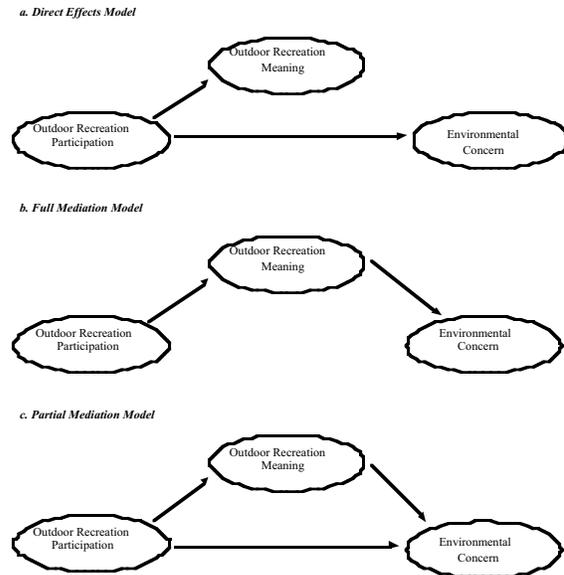


Figure 1. Direct effects, full mediation, and partial mediation models used to examine the mediation of meaning on the recreation participation / environmental concern relationship.

those activities. A 5-point unipolar importance scale was used. Internal consistency of items in experience preference domains (Manfredo et al. 1996) was examined using Cronbach's alpha for domains with three or more items and Pearson's correlation for domains with two items. Respondents' score on each domain was the mean of the items making up that domain and represented the various aspects of meaning that the activity held for the participant.

Environmental concern. The New Ecological Paradigm (NEP; Dunlap, Van Liere, Mertig, & Jones, 2000) was used as a single-factor measure of environmental concern. Respondents indicated if they agreed or disagreed with 15 NEP items using a 7-point Likert scale. Confirmatory factor analysis of the NEP tested a single factor environmental concern model. Prior to CFA, individual items of the NEP were coded such that high scores on the latent variable in the structural equation analysis represented a biocentric focus of environmental concern while low scores represented an anthropocentric focus.

Analysis

Mediation analysis (Baron and Kenny 1986) was conducted to determine if the meaning of outdoor

Table 1. — Results of Factor Analysis on Participation in Outdoor Recreation Activities (N = 900)

Non Consumptive Outdoor					
Recreation Activity	Outdoor Adventure	Assisted Physical	Hunting	Fishing	Nature Appreciation
Rock climbing	.701	.144	.112	.068	-.038
Mountaineering	.615	.081	-.083	.138	.066
Ice climbing	.756	.069	-.068	-.114	.025
Whitewater boating	.641	.144	.088	.035	-.044
Flatwater floating	.556	.256	.095	.147	.226
Backpacking	.644	.136	.155	.180	.071
Hiking	.638	.088	.166	.146	.112
Bicycling	.120	.668	-.086	-.041	.146
Mountain biking	.111	.612	.049	.188	-.063
X – country ski/snowshoe	.158	.514	-.116	.255	.141
Downhill ski/snowboard	.183	.536	-.132	.101	-.196
Outdoor photography	.074	.068	-.055	.215	.585
Auto sightseeing	-.065	.112	-.025	-.312	.638
Wildlife viewing	.152	-.089	.223	.185	.612

recreation mediates the direct relationship between outdoor recreation participation and environmental concern. Mediation of the relationship between 2 variables requires 3 conditions (Baron and Kenny 1986). For this study, the first condition is that a direct relationship exists between non-consumptive outdoor recreation participation (the predictor variable) and environmental concern (the criterion variable). The second condition is that a direct relationship exists between non-consumptive outdoor recreation participation and outdoor recreation meaning. A direct-effects model illustrates the first two conditions (figure 1c). This model posits a direct relationship between outdoor recreation participation and environmental concern and constrains the relationship between outdoor recreation meaning and environmental concern to zero. The third condition requires that the relationship between non-consumptive outdoor recreation participation and environmental concern becomes zero when the zero-value constraint on the relationship between outdoor recreation meaning and environmental concern is removed; the full mediation model (figure 1b). It is possible that allowing outdoor recreation meaning to affect environmental concern would not eliminate the relationship between the non-consumptive outdoor recreation participation and environmental concern as suggested by the full mediation model. A partial mediation model (figure 1c) allows for both non-consumptive outdoor recreation participation and

meaning to influence environmental concern.

The existence of mediation of the outdoor recreation participation/environmental concern relationship by outdoor recreation meaning was tested using structural equation analysis (Arbuckle 1997). For each outdoor recreation activity category we compared the direct effects model with the full mediation model using the change in chi-square statistic. A high X^2 suggests that there is a significant difference between the data and proposed model, relative to a low X^2 . Therefore, if there was a significant difference in the X^2 statistics of the two models, the model with the lowest chi-square was considered the best fit of the data. Following this, the better of the direct effects and full mediation models was compared to the partial mediation model using the same change in chi-squared analysis to determine which model was the best fit of the data.

Results

Respondents were predominantly (73%) male. This is attributed to the fact that 1/2 of the sample was drawn from applicants for hunting and fishing licenses in Washington. The mean age of respondents was 50.9 years (SD=15.5; range = 18 - 79 years). The sample was 92% Caucasian while Asians, American - Indians and Alaskan - Natives, Hispanics, African - Americans, and multi - racial individuals each individually comprised 2% or less of the sample. Median household income was in

the \$25,000 - \$49,000 range. Most (65%) respondents attended some college and an additional 29% completed their education with a high school or technical degree.

Results of Factor analysis

Table 1 shows the factor analysis for non-consumptive outdoor recreation participation. The purpose of this procedure was to simplify the analysis by grouping specific outdoor recreation activities into smaller groups based on participation. Three groups of activities were identified. "Outdoor Adventure" activities included backpacking, rock and ice climbing, mountaineering, whitewater and flatwater boating, and hiking. "Assisted Physical" activities included mountain biking, bicycling, cross-country skiing, and downhill skiing. "Nature Appreciation" activities included outdoor photography, wildlife viewing, and auto sightseeing.

Confirmatory factor analysis supported a single factor of the New Ecological Paradigm based on an anthropocentric/biocentric continuum ($X^2/df = 1.38^1$; GFI = .973; RMR = .165; Cronbach's alpha = .839). The validity of our choice to sort REP items into their theoretical REP domains was performed using correlation. Cronbach alpha was used to examine domains with 3 or more items and Pearson's correlation was used for domains with only 2 items. All domains had high reliability/correlation to allow for the creation of indices ($a = .744$ to $.819$; $r = .600$ to $.799$).

Identifying Potential Mediators

Prior to hypothesis testing, partial correlations between experience preference domains (outdoor recreation meaning) and non-consumptive outdoor recreation participation were conducted (table 2). If an experience preference domain was significantly correlated with an outdoor recreation category, the experience domain was considered a potential mediator of the outdoor recreation participation / environmental concern relationship. The "Outdoor Adventure" category was significantly correlated with a desire for Achievement and Stimulation, Learning, Nature Enjoyment, and Physical Fitness. "Assisted Physical" category was correlated with a desire for Achievement and Stimulation, Autonomy, using one's Equipment, Learning, Nature Enjoyment, and Reduced Risk. The "Nature Appreciation" category was related to a desire for Learning and Nature Enjoyment.

Hypothesis Testing

To test our hypothesis the direct effects, full mediation, and partial mediation models for the non-consumptive outdoor recreation activities were compared. The study hypothesis predicted that the direct relationship between non-consumptive outdoor recreation participation and environmental concern would be mediated by outdoor recreation meaning. Using structural analysis, we first determined if the data fit the full mediation model better than the direct effects model for each outdoor recreation category. The better of these 2 models was then compared to the partial mediation model. The hypothesis was supported if the full mediation model provided the best fit of the data. If the partial mediation model was the best fit, the hypothesis was supported with reservation. If the partial mediation model did not provide a significantly different fit of the data than the full mediation model, the more parsimonious full mediation model was presumed to be superior. This result suggested that outdoor recreation participation did not add any useful information to the prediction of environmental concern. Table 5 also presents the goodness of fit statistics for each model tested. A high goodness of fit for a model (denoted by GFI > .90 and $(X^2/df < 5.00)$ (Arbuckle 1997) suggested that the model was an acceptable model for predicting environmental concern. Unacceptable fit suggests that other factors provide a significant amount of predictive power of environmental concern. Figure 2 presents path coefficients for the models that represented the best fit of data for each activity. Positive coefficients between outdoor recreation meaning domains and environmental concern represent a direct relation to a biocentric focus of environmental concern while negative coefficients represent a direct relation to an anthropocentric focus.

Outdoor Adventure. For outdoor adventure activities, the data fit the full mediation model better than the direct effects model (Comparison 1: $\Delta X^2 = 70.14$; $p < .005$). In addition, data did not fit the partial mediation model better than the full mediation model (Comparison 2: $\Delta X^2 = 0.02$; $p = .999$), supporting the study hypothesis. Fit indices (GFI < .90 and $(X^2/df > 5.00)$ suggested that none of the models for outdoor adventure represented a strong fit of the data. The extent to which individuals participate in non-consumptive outdoor adventure activities for the purpose

Table 2. — Partial Correlations between Outdoor Recreation Activity and Experience Preference (N = 900)

Non-Consumptive Outdoor Recreation Activity	Outdoor Adventure	Assisted Physical	Nature Appreciation
Achievement/Stimulation	.090*	.108*	-.045
Autonomy	-.040	.121*	-.028
Risk Taking	-.064	-.011	-.048
Equipment	-.037	.158*	-.318
Family Togetherness	.016	.010	-.030
Similar People	-.090	.039	-.069
New People	-.061	.008	.013
Learning	.108*	.097*	.138*
Enjoy Nature	.154*	.108*	.161*
Introspection	.007	.059	.002
Creativity	-.044	.049	.018
Nostalgia	-.060	.027	-.015
Physical Fitness	.108*	.033	-.060
Physical Rest	-.024	.068	.046
Escape Personal Pressure	.054	.049	-.020
Escape Physical Pressure	-.067	.064	.006
Social Security	-.067	.044	.014
Risk Reduction	-.042	.077*	-.011
Teaching Others	-.061	-.001	-.012

of achievement/stimulation, learning, or enjoying nature was directly related to a biocentric focus of environmental concern (figure 2).

Assisted Physical. The study hypothesis was supported for assisted physical activities. Data fit the full mediation model significantly better than the direct effects model (Comparison 1: ($\Delta X^2 = 73.66$; $p < .005$), while the partial mediation model was not an improvement over the full mediation model (Comparison 2: ($\Delta X^2 = 0.72$; $p = .981$). Fit indices showed an unfavorable fit of all three models with $GFI < .90$ and $(X^2/df > 5.0$. Participating in assisted physical activities for the purpose of learning or enjoying nature was directly related to a biocentric focus of environmental concern. Participating for autonomy, using equipment, or reducing risk related to an anthropocentric focus (figure 2).

Nature Appreciation. For nature appreciation, the data fit the full mediation model better than the direct effects model (Comparison 1: ($\Delta X^2 = 60.77$; $p < .005$). The partial mediation model was not a

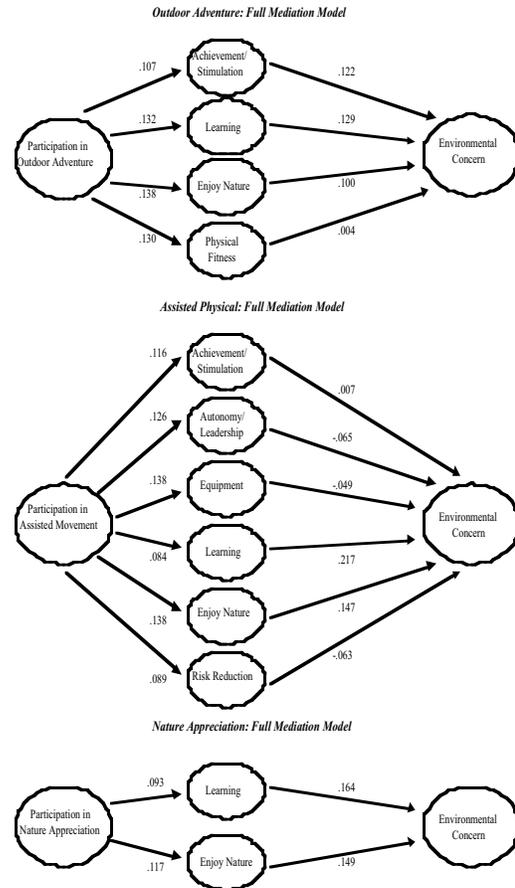


Figure 2. Best fit models of the relationships among non-consumptive outdoor recreation participation, meaning, and environmental concern.

significant improvement over the full mediation model (Comparison 2: ($\Delta X^2 = 0.60$; $p = .345$) supporting the study hypothesis for nature appreciation. Data was not an acceptable fit of the three structural models ($GFI < .900$ and $(X^2/df > 5.0)$. Participating for learning or enjoying nature was directly related to a biocentric focus of environmental concern (figure 2).

Discussion

The general hypothesis that the meaning of non-consumptive outdoor recreation to people would mediate the often-proposed relationship between participation and environmental concern was generally supported in this study. For outdoor adventure, assisted physical, and nature appreciation, the relationship between participation and environmental concern was completely mediated by the meaning of those activities. These

results support our contention that the meaning of non-consumptive outdoor recreation to people does provide some explanation as to the nature of their concern for the environment, and in most cases supplants any predictive value that simple participation may have.

Enhancing the role that the meaning of non-consumptive outdoor recreation participation has on predicting environmental concern is the consistency of effects of each dimension of meaning across activity category. For example, obtaining achievement and/or stimulation in an outdoor recreation activity was directly related to a biocentric focus of environmental concern, regardless of the activity for which it was engaged in. Learning about the activity/nature and enjoying nature were similarly connected to a biocentric focus of environmental concern for all relevant outdoor activity categories. It is important to note, however, that results of this study are limited to recognizing a mediating effect of meaning on the relationship between non-consumptive participation and environmental concern. It is possible that the specific relationship between meaning and environmental concern will differ across studies depending on how precisely recreation activity categories are defined.

Another important finding of this study centers on the quality of fit of the models. In nearly all cases, the data fell short of an acceptable fit of the direct effects and full mediation models. This is not only illustrated by the specific indices used in this study to test goodness of fit, but also by an examination of the general strength of the relationships proposed by each model. Overall, only 2 meaning/environmental concern relationships showed regression weights greater than .200. Many fell between .100 and .200 with several hovering just below .100. This supports the notion that the relationship between environmental concern and non-consumptive outdoor recreation, whether it is operationalized as participation or meaning, may not be a strong one. Clearly other factors play a role in how an individual views the natural environment beyond one's leisure lifestyle.

Conclusion

This study supported the notion that while a relationship between non-consumptive outdoor recreation and environmental concern exists, it is

tenuous, and other factors may affect the relationship. Mediation analysis supported the idea that if non-consumptive activity is related to environmental concern, it is through the meaning of rather than participation in the activity. Dunlap's and Heffernan's (1975) suggestion that outdoor recreation users constitute an untapped group of environmental advocates still remains a debatable issue, especially when the focus is on comparing specific types of outdoor recreationists. Many of the non-consumptive outdoor recreation activities in this study were directly related to biocentric foci of environmental concern, depending on the meaning that was salient.

Several important considerations related to the study call for additional research in this area. One involves the ethnic makeup of the study respondents. Nearly 3/4 of the respondents were male and more than 9 of 10 were Caucasian. This severely limits the ability to make any generalizations toward the general population. That women, African - Americans, Hispanics, Asian - Americans, and Native - Americans might differ from male Caucasians in the activities participated in and the meaning of those activities is a clear observation. Additional research should be conducted to identify these differences in outdoor recreation participation and meaning across sex and ethnicity and how these differences play out in examining environmental concern.

Another important consideration involves measuring outdoor recreation meaning. Our decision to think about meaning as experience preferences and history represented a use of two commonly measured factors that examine outdoor recreation participation beyond simple participation. Other researchers might identify other factors that represent "meaning" such as place attachment, specialization, involvement, the role of an activity as "serious leisure", benefits desired, among others. Research on the role of outdoor recreation meaning would benefit from efforts to uniformly define, develop, and validate measures of meaning. Finally, our use of truncated groups of activities was done to simplify analysis by identifying groups of activities that individuals participate in. Future research should identify specific outdoor recreation activities to connect with environmental concern in order to begin to develop a theory about the connection between the

way someone thinks about the environment and the hows and whys of outdoor recreation participation.

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Pages 262-269 in:

Murdy, James, comp., ed. 2004. **Proceedings of the 2003 Northeastern Recreation Research Symposium**. Gen. Tech. Rep. NE-317. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station. 459 p.

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Published by:
USDA FOREST SERVICE
11 CAMPUS BLVD SUITE 200
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July 2004

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