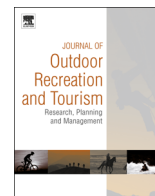




ELSEVIER

Contents lists available at ScienceDirect

Journal of Outdoor Recreation and Tourism

journal homepage: www.elsevier.com/locate/jort

Uncertainty, data treatment, and the measurement of outdoor recreation expenditure

Kreg Lindberg^{a,*}, Peter Fredman^b^a Oregon State University – Cascades, 2600 NW College Way, Bend, OR 97703, USA^b Norwegian University of Life Sciences (NMBU), Norway

ARTICLE INFO

Article history:

Received 4 September 2013

Received in revised form

6 August 2015

Accepted 30 November 2015

Keywords:

Recreation expenditure

Economic impact

Recall

Uncertainty

ABSTRACT

Expenditure and economic impact analyses are common in outdoor recreation and tourism, but there are potential sources of error in resulting estimates. The present study extends expenditure evaluation using national period-based reporting data from Sweden. This appears to be the first study that: (i) systematically provided respondents with opportunities to correct reported expenditure amounts and (ii) utilized corrections, certainty evaluations, and survey completion time to adjust expenditure estimates. Greater expenditure complexity was associated with lower respondent certainty in expenditure reports. Survey completion time was positively correlated with certainty, though only marginally so. Fewer than 10% of respondents changed expenditure reports, and the changes did not have a dramatic effect on mean expenditure. Expenditure amounts in the fuel and grocery categories were the most likely to be changed and the most likely to affect reported certainty; this is consistent with potential error arising from allocation of expenditure to recreation versus non-recreation purposes. Most of the data treatments resulted in means and standard deviations that were within 10% of the common Naïve approach; however, the "high certainty" treatment substantially reduced the expenditure mean and standard deviation. Given the prevalence and importance of economic impact estimates, the diversity of analysis contexts, and the paucity of past research, further evaluation of alternate survey administration and data treatment approaches is recommended. This research will contribute to more informed policy making and management through enhanced data quality.

MANAGEMENT IMPLICATIONS

Recreation is one of the important ecosystem services that natural areas provide, and the economic impact of visitor expenditure is one rationale for promoting outdoor recreation participation and sustaining natural areas. This study contributes to informed policy making and management by (i) providing guidance regarding data collection methods, including the role of probing and survey completion time, and (ii) illustrating different treatments of reported expenditure, with potential implications for data quality and results.

© 2015 Elsevier Ltd. All rights reserved.

1. Introduction

Recreation is one of the important ecosystem services that natural areas provide. The economic impact of visitor expenditure is one rationale for promoting outdoor recreation participation (Pollock, Chase, Ginger, & Kolodinsky, 2012), as well as for establishing and sustaining protected areas and recreation access within them (Millennium Ecosystem Assessment, 2005; Stolton & Dudley, 2010). Southwick and associates estimate that the

combined economic contributions of non-motorized recreation to the US economy exceed US\$590 billion annually in total gross output (Southwick, Bergstrom, & Clint, 2009).

Economic impact analyses are common in both outdoor recreation and tourism research, but concerns about the accuracy of resulting estimates are common (Crompton, 2010; Stynes & White, 2006). One major concern is measurement or response error, the difference between the spending reported by respondents and the amount they actually spent (O'Muircheartaigh, 1997; Stynes & White, 2006). One source of measurement error stems from the difficulty respondents may have in accurately recalling their spending.

Insofar as decisions about whether and how to conserve protected areas and recreation access depend on associated economic

* Corresponding author.

E-mail address: kreg.lindberg@osucascades.edu (K. Lindberg).

impact, it is important to accurately measure the expenditure that generates this impact. There have been limited evaluations of recall accuracy in the expenditure context, but several evaluations of respondent uncertainty have been conducted in the context of contingent valuation (CV) (Loomis & Ekstrand, 1998; Lyssenko & Martínez-Españera, 2012). The present study extends evaluation of expenditure accuracy using a national data set from Sweden and concepts from the cognitive aspects of survey methods and CV literatures. To our knowledge, this is the first study that (i) systematically provided respondents with opportunities to correct reported expenditure amounts and (ii) utilized corrections, certainty evaluations, and survey completion time to adjust expenditure estimates. Results provide initial guidance for researchers and managers that collect and utilize expenditure data, thereby contributing to better informed policy making.

2. Background

2.1. Process and error sources

Research in the cognitive aspects of survey methods (CASM), including its application to behavioral frequency judgments, provides guidance on potential causes of respondent uncertainty and reporting errors (Schwarz, 2007). As noted by Menon and Yorkston (2000), respondents rarely recall-and-count all episodes of frequent behaviors (in the present context, frequent expenditures). Rather they rely on recall-and-extrapolate approaches, using rate estimation to report the frequency of behaviors (expenditures). Alternatively, some respondents may simply guess. As Tourangeau, Rips, and Rasinski (2000) note, one should view such categorizations as continua, with respondents potentially using a combination of approaches.

The approach utilized and the quality of reports may be affected by the frequency, regularity, and importance of the behavior, as well as the level of respondent motivation within the recall task. An infrequent and important behavior may be recalled relatively easily using episodic recall (recall-and-count). A frequent and regular behavior may be estimated (recall-and-extrapolate) if the respondent is motivated to do so. However, a frequent and irregular behavior may be more difficult to either recall or estimate.

Expenditure reporting may be even more difficult than participation reporting because the former may exhibit greater irregularity (e.g., one might hike every Saturday, but with differing expenditure amounts across Saturdays). Indeed, Champ and Bishop (1996) observe that reporting may be challenging because recreation expenditures generally are irregular in nature, relative to the more common and consistent purchase of food or other consumer goods. Reports are least likely to be accurate when the event is "irregular (and thus difficult to estimate) and unimportant (and thus difficult to retrieve)" (Tourangeau et al., 2000: 86); many recreation expenditures may fall into this category.

There are multiple types of recall error, including telescoping (mismatch between perceived and actual date of expenditure relative to the reporting period) and omission (failure to recall expenditure events). In addition, there may be "errors in detail." A respondent may recall the expenditure event, but not the specific expenditure amount. In addition, a respondent may recognize that a portion of a shared expenditure should be reported, but may have difficulty identifying the proportion. For example, a respondent may be able to recall or estimate the cost of filling her car with fuel but not be able to identify how much of the total cost should be allocated to recreation-related driving. These errors in detail and proportion allocation are of particular interest in the present context.

Analysts may have *a priori* expectations of accuracy based on the above principles. For example, they may expect infrequent and important expenditure events to be recalled relatively accurately. They may expect unimportant but regular expenditure events to be recalled relatively accurately by more motivated respondents and less accurately by less motivated respondents. Lastly, they may expect unimportant and irregular expenditure events to be recalled less accurately by all but the most motivated respondents. Reported certainty provides a mechanism for confirming or adjusting these expectations; it is a way for individual respondents to signal the level of confidence that researchers might have in the reported expenditure data. Reported certainty may be particularly useful when the type of reporting task is cognitively demanding for respondents.

The accuracy of expenditure reports may be increased through survey content, including decompositional techniques such as presenting questions regarding the presence of expenditure by activity, as well as the use of expenditure categories. Such techniques are especially useful for episodic recall or irregular behaviors (Menon & Yorkston, 2000). Moreover, provision of even a small amount of extra response time can facilitate recall (Tourangeau et al., 2000). Though the survey process and content differed, the work of Fournier et al. (2011) suggests that provision for deliberation within the survey may increase reporting accuracy; in the expenditure context, one simple provision is the ability to reflect on and modify the initially-reported amount. Nonetheless, respondent uncertainty may remain and merit measurement.

2.2. Reporting methods and previous evaluations

There are multiple methods for gathering expenditure estimates. First, respondents may be asked to record expenditures as they occur during a recreation trip, using diaries. Second, they may be asked to report past, and possibly expected future, trip expenditure during their trip, using a one-time intercept survey. Third, they may be asked to report past trip expenditure after their trip is completed. Fourth, they may be asked to report expenditure for multiple past trips and/or for recreation-related items not associated with specific trips. The present analysis focuses on this period-based, rather than trip-based, expenditure.

The diary method is expected to reduce cognitive errors because it reduces the time delay between expenditure and its reporting. It also may catalyze a high level of respondent motivation. Diaries potentially can reduce the four main classes of memory problems noted by Tourangeau et al. (2000): encoding problems, storage problems, retrieval failure, and reconstruction errors.

However, the diary method is more demanding of respondents, may suffer from nonresponse error, and is impractical in many contexts (Faulkner & Raybould, 1995). Practicality is especially important for the extended period-based reporting utilized in the present analysis; there may be challenges in recruiting a representative sample of participants willing to maintain an expenditure diary over a multi-month period.

Published evaluations of recreation expenditure methods are limited. Champ and Bishop (1996) used a split-sample approach to compare expenditure reports from *ex post* (after-trip) surveys and diaries. Overall, they conclude that after-trip survey expenditure estimates do not statistically differ from diary estimates, at least when surveys occur soon after the trip. However, their analysis involved modest sample sizes and was limited to hunting trips. Faulkner and Raybould (1995) found that diary and survey methods produced similar total expenditure estimates in the context of spending at a sporting event, but that expenditure in some categories statistically differed. This could lead to differences in total economic impact insofar as import patterns vary across categories in the study region.

Download English Version:

<https://daneshyari.com/en/article/92390>

Download Persian Version:

<https://daneshyari.com/article/92390>

[Daneshyari.com](https://daneshyari.com)