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A two-step approach to evaluating sustainability-related consumer education interventions

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ABSTRACT

The characteristics of creative educational interventions and the way they are implemented in the field often make their evaluation a challenging task. This article uses an exemplary intervention from a large-scale consumer education program on climate protection to present the design, method, and results of a two-step evaluation procedure which allows evaluators to cope with such a situation. Step 1 aims to answer the question of whether or not an intervention actually has the intended effects. Step 2 then assesses the factors that contribute to those effects. Thus, such a two-step evaluation yields information, not only on which interventions are effective and should therefore be maintained, but also on how they should be designed to achieve maximum effects.

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1. Introduction

This article deals with the question of how to evaluate innovative sustainability-related educational interventions under challenging conditions. In it, we present the basic approach and methodological background of a two-step evaluation procedure that was developed and implemented during the evaluation of a large-scale consumer education program on climate protection and has the potential to be applied in a wide range of topical areas.

The educational program under study provided a neat example of organizational creativity. Not only did many of its interventions represent innovations in their own right—being original and the result of collective creative processes. In most cases they were also organizational innovations for the implementing consumer organizations. Therefore, there was a need for a formative evaluation accompanying the implementation process, which could not only show whether or not the interventions actually had the intended effects and should therefore be maintained, but also identify starting points for their optimization.

In the following section, we first outline the proposed two-step procedure for evaluating consumer education interventions. Next, we introduce the educational program and the exemplary intervention chosen to illustrate our approach. Then, we describe the actual evaluation process and its empirical results and discuss problems and limitations related to our approach. Finally, we present a narrative summary of the findings and their practical implications.

2. The two-step evaluation approach

2.1. Step 1: assessing whether an intervention works

Probably the most intuitive question which funders, decision makers, or intervention planners would ask evaluators of consumer education interventions is whether their implementation actually leads to the intended effects or not. Although this question is easily asked, it is one of the most difficult to answer in evaluation practice (Stockmann, 2008). Besides problems related to sampling and to the reliable and valid measurement of the outcome variables, this has mainly to do with the difficulties related to estimating unbiased causal effects.

Based on the Potential Outcome Framework (Rubin, 1974), the counterfactual approach to causation suggests that the causal effect of an intervention on an individual can be considered as the difference between the factual and counterfactual states of a research

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unit in terms of an outcome variable Y. Consequently, a causal effect is defined as the difference in Y between a unit after having been exposed to a treatment and the same unit (under the same conditions) having not received the treatment. However, there is also the fundamental problem of causal inference (Holland, 1986), which is that one cannot observe the same unit in both conditions at the same time. In order to deal with this problem, evaluators have to estimate the counterfactual by the use of adequate evaluation designs.

Basically, "true" experiments (also "randomized controlled trials" or RCTs) are thought to serve this purpose well because randomized control groups are considered to provide unbiased estimates of the true (but non-observable) average counterfactual (Morgan and Winship, 2007). Therefore, leaving aside other threats to internal validity—such as attrition (Shadish et al., 2002) or experience limitation (Aiken and West, 1990)—comparing the average Y between the treatment and control groups provides unbiased estimates of intervention effects, because bias due to systematic selection into the groups is eliminated by randomization.

Despite the virtues of RCTs for estimating causal intervention effects, there is the problem that consumer education interventions frequently take place in so-called "turbulent action settings" in which it is difficult to conduct RCTs (Bloom and Ford, 1979). More specifically, "random assignment and the establishment of control groups can become difficult if a program is already in operation, or if program administrators find it socially unacceptable to withhold an educational treatment from any individuals. Moreover, if a program has voluntary participation …, random assignment becomes even more difficult" (Bloom and Ford, 1979, p. 272). Yet evaluation designs are not ends in their own right, and when the application of RCTs is not feasible, there is the (second best) option of applying less rigorous designs instead of completely abandoning the attempt to estimate these effects. After all, as pointed out by White (2010), the best *available* method in a given evaluation setting should be used to answer the evaluation questions. Besides RCTs, other appropriate designs for quantitative impact evaluation of consumer education interventions might, for example, be nonequivalent comparison group designs (Shadish et al., 2002), pretest-posttest designs (White, 2010), or even simpler approaches like retrospective pretest methodology (Pratt et al., 2000).

2.2. Step 2: determining how an intervention works

The exclusive focus on assessing impacts (sometimes denoted as the "black box paradigm") is often not sufficient to improve the effectiveness of consumer education interventions because of a lack of knowledge about their key drivers of success. Therefore, evaluators should not only estimate the effects of an intervention but also investigate the causes of those effects.

A well suited approach to shedding light on the mechanisms that lead to the induction of effects—and thus to breaking up the black box—is the theory-driven approach to (impact) evaluation (Astbury and Leeuw, 2010; White, 2009). In this approach, the process of theoretically relating intervention outcomes to different (potential) determinants is called the development of a "causal program theory" (Chen, 1989) or "treatment theory" (Finney and Moos, 1989). Developing such a treatment theory requires assumptions about the potential mechanisms between program inputs, contexts and outcomes. The problem is that these mechanisms are often hidden or not directly observable (Astbury and Leeuw, 2010). Thus, evaluators of consumer education interventions have to develop treatment theories by using scientific theories and concepts from scholarly literature and/or relying on the assumptions and experiences of treatment providers (Finney and Moos, 1989), who usually possess valuable expert knowledge as regards the intervention to be evaluated.

Although the development of a treatment theory for a given intervention may be hard enough to accomplish, the empirical testing of that theory may be even harder. First and foremost, this has to do with the fact that hypotheses derived from treatment theories usually imply assumptions about causal relations (e.g., "The better the quality of the education material, the more the participants learn".) Yet as pointed out before, estimating causal effects is already a difficult task even when testing one causal relation (i.e., the relation between the intervention as a whole and the outcome variable Y) and it becomes even more difficult when various causal relations have to be tested. Firstly, this is because some independent variables such as gender or age cannot be manipulated by the evaluator, which impedes the application of RCTs. Secondly, and most importantly, even if RCTs or other comparative research methods could be used to test the relation between context factors, features of the intervention, characteristics of participants, and the outcome variables of interest, evaluation budgets do not usually allow several experiments or quasi-experiments to be conducted within one evaluation project. Accordingly, Rogers (2007, p. 66) notes in this context that a "program theory can be used to develop 'testable hypotheses,' which are then investigated using nonexperimental methods." Generally, such methods can be of a quantitative or qualitative nature. In this article, we focus on quantitative methods and follow Adedokun et al. (2011), who suggested using structural equation modeling to test the treatment theory of an intervention under study.

3. Exemplary application of the two-step evaluation approach

3.1. The consumer education program and its interventions

The program "Starke Verbraucher für ein gutes Klima" (strong consumers for a good climate) was conducted by the German Federation of Consumer Associations (vzbv) and involved the 16 consumer centers of the federal states and five other consumer associations which were also members. It was funded by the German Federal Ministry for the Environment within its National Climate Initiative. During a two-year period, the program activities covered topics like low-emission mobility, climate-friendly nutrition, and carbon-neutral investment. To attain the overall goals of the program, more than 15 different types of educational intervention were planned and implemented. For six of these intervention types, two-step evaluations were conducted.

Basically, the program interventions can be subdivided into two categories. The first category, "secondary and adult climate education," included not only school programs in cooperation with teachers, but also numerous informational events and workshops aimed at adult consumers. By far the largest part of these activities, however, belonged to the second category, "informal climate education," which comprised consumer advice and information activities as well as what we call event education interventions. These informal education activities were special insofar as the participants' interaction with the interventions was usually rather brief (i.e., less than 30 min) While there are numerous studies on the impact of education activities in the first category (e.g., Jordan et al., 1986; Zelezny, 1999), no systematic research exists on these short-term interventions. Additionally, reviewing the relevant literature reveals that empirical studies usually assess only the impact of an intervention—that is, *whether or not* it works—but not *how* it works.

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