PUBLIC JUDGMENT OF AN ENVIRONMENTAL HEALTH HAZARD:

TWO STUDIES OF THE ASARCO SMELTER

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ABSTRACT

Results from two studies focusing on public risk judgment concerning the ASARCO Smelter in Tacoma, Washington are reported. The first study examines the factors affecting risk judgment among persons directly exposed to emissions from the smelter. Two public samples were studied, one composed of participants in public hearings and one generated by a telephone sampling of the general population of Tacoma. For these public groups, risk judgments and risk tolerance were closely associated with judged benefits of the hazard source, among other factors, and not with level of technical information about the hazard nor to residential distance from the smelter. The second study employed college students as subjects in a "simulated hazard" where subjects were instructed to respond "as if they lived in an area of Tacoma affected by the smelter." Where the primary purpose of the first study was substantive, that of the second study was methodological, exploring the use of a longitudinal panel design to study risk judgment. Data were collected from the same subjects at three points in time, a week separating the first from the second and the second from the third. Information about the hazard was made available to subjects during the breaks between sessions. In each testing period, subjects provided information on judgments of risk, on their information seeking behavior and on risk mitigation. These data were used to test and revise a structural model of the effects of information on risk judgment and risk mitigation.

KEY WORDS: Risk Judgment, Risk Communication, Hazard Information, ASARCO Smelter

The public information activities undertaken by the Environmental Protection Agency as part of the hazard management process for the ASARCO smelter in Tacoma, Washington, provided a rare opportunity to study the effects of formal risk estimates on public risk judgments. Two such studies are described in this report. The first study is a field study,

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examining the factors affecting risk judgments among persons directly exposed to emissions from the smelter. The results of this study raise doubts about the direct effects of formal risk estimates (i.e., calculated, scientific or technical estimates of the ill effects of a hazard). The second study is a laboratory study, exploring the factors affecting the use of hazard information by college-student subjects acting as if they were residents of Tacoma. A local earthquake hazard is used as a comparison case to help demonstrate those conditions that lead to the seeking out and use of hazard information.

FIELD STUDY

INTRODUCTION

Other participants in this symposium have addressed the many technical problems associated with estimating and attempting to manage the risks of the ASARCO smelter. The complexity of those problems and the uncertainties that accompany them would in themselves make determination of the best course of regulatory action a difficult task. In the ASARCO case, as in most risk management cases, the technical and scientific difficulties are compounded by complex social questions and by the legal and ethical right of the affected public to have an influence on the risk management process.

From a social science perspective the ASARCO case presented a unique opportunity for research. It raised the difficult questions of risks versus benefits, and, at the same time, involved a natural population of potential subjects who were directly exposed to the risks and had an opportunity to influence their level of exposure. Along with these characteristics, the Environmental Protection Agency's efforts to publicize its formal risk estimates and proposed controls made it possible to examine the effects of such information on public reactions. In light of the other papers describing elements of the formal risk estimation process, this paper will emphasize findings relating to the effects, or as the case may be, the lack of effects of formal risk estimates on public opinions and risk tolerance.

Method

The findings to be reported here are based on data collected from questionnaires distributed at the EPA-sponsored public hearings in Tacoma, and from a concurrent systematic telephone survey of persons living within a twelve mile radius of the smelter. A total of 347 completed questionnaires were collected at the hearings, an estimated 80% of the hearing attendees who were residents of the affected area. Two hundred and sixty-six persons completed the telephone survey.

Questionnaire items were essentially the same for both the hearing and phone samples. They were designed to measure such variables as respondents' informal risk estimates, judgments of the risks versus benefits of the smelter, voluntariness of the risk exposures, environmental ideology, and factual knowledge of the formal risk estimates and proposed regulations. A variety of demographic factors were also examined, the most important of these including distance of residence from the smelter, length of residence in the area, age and family member employment at the smelter.

In the data analyses all of the variables just described were considered in relation to respondents' attitudes toward additional