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4.4 Electro-mechanical devices for recording readership: report of a development project

INTRODUCTION

Since the 1981 New Orleans Conference, Time Inc. has made a considered effort to develop or to support the development of new and better ways of measuring magazine readership. For example, at a number of domestic and international conferences, we have called upon researchers in our industry to approach Time Inc. for funding to test and to develop new methods. There has been minimal response to this appeal.

To expand the thinking on this area, Time Inc. staff researchers went outside the field of marketing research and approached a number of leading behavioural scientists, seeking to interest them in working on this problem. The results of this effort fell into two categories: (1) the scientists had little interest in the problem, or (2) they felt that we were demanding too much from survey and behavioural science methodologies.

Was it possible, we asked ourselves, that new developments in the physical sciences would permit us to record accurately and reliably those data we sought without calling upon a respondent to recall or recognize some past behaviour? We have all read about the wonders of electronics, the advances in 'chip' technology, etc. Could those developments help us?

To explore that question, we employed SRI International, a highly respected international research organization which maintains one of the leading research and development laboratories in the world. Over a period of approximately 18 months Time Inc. funded SRI's work in this area, and the authors worked closely with the SRI engineers and physicists.

What follows is a brief report of progress and an outline of next steps.

CONCEPTUAL FRAMEWORK

A mechanical or electrical means of determining the average number of readers per issue for a given magazine title can be based either upon the magazine or the reader. In the former category, one would expect the magazine to record — somehow — the number of times it was picked up or opened by different people, how long it was opened, the demographic characteristics of the people picking it up, etc. Aside from the difficulty of detecting and recording such data in the magazine itself, a major problem is tracking the physical locations of the magazines so that they can be retrieved. Missing magazines mean, in this kind of scheme, missing data. If one thinks through the problems of retrieval — searching dustbins, etc — it becomes clear that the problems in this kind of approach are probably insuperable.

The difficulties with a system based on the magazine quickly lead one to consider a system based on the reader or prospective reader. It is clear from the outset that in such a system the magazine must send a signal to the respondent which is recorded and subject to retrieval. A clear first step was to determine what wavelengths or frequencies of the electromagnetic radiation spectrum would be appropriate, which would inflict no health hazard and would not interfere with the reader's normal activities? Furthermore, the system must be capable of handling *all* readership situations with a low error rate.

Additional condititions imposed by Time Inc. included: the system should be capable of measurement in the home and elsewhere; the measurement system should be unobtrusive; and ultimately the cost of instrumentation of the magazine copies should be less than one cent per copy.

RESULTS

We do *not* have a working system to demonstrate here. Rather, we have enough laboratory and theoretical research to know that we have found two feasible methods, both of which need considerably more research before they can be implemented, and both of which need considerable development to miniaturize the necessary equipment. But we are confident that one or both of these systems will work: after a description of each, we describe how they might be used. The two techniques are a radio frequency one and an ultrasonic one.

In the radio frequency method, the basic principle includes printing a loop in the magazine and having a respondent carry a transmitter and a receiver. The process is as follows: the transmitter is turned on automatically for a few milliseconds and then is disconnected. If there is no magazine present, nothing happens. If there is a magazine within range, the

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magazine circuit will oscillate for a number of cycles, thereby becoming a transmitter. In effect, when the circuit in the magazine is triggered, it rings back and a receiver could detect that ringing.

This is not a new idea — it is incorporated in the systems used to detect theft of objects from retail stores, for example. But in this case, the loops in the magazine would be structured in such a way that the signal they transmit is coded for title and issue date.

Among the tests performed in the laboratory setup used to investigate this kind of system was one in which angular sensitivity was checked. It does occur that certain angles do produce very weak signals, but these are very small angles, and a reader is unlikely to maintain a magazine in that particular position during the entire reading interval

The basic problem we found in this approach is one of power. The signal coming back from the magazine is just too weak to be detected at a reasonable cost. To improve signal strength, one can transmit more power, use bigger loops in the magazine, place the receiver closer to the transmitter, etc, all of which are either too expensive or make the entire system too obtrusive to obtain the kind of measurement we want.

SRI International has developed an alternative radio frequency scheme, which it has labelled a 'Stepped Radio Frequency System'. It is described as follows. "A single voltage-tuned oscillator serves as both transmitter and local oscillator for reception. The frequency varies with time, in a stair step fashion, under the control of a clock. A magazine containing a suitably tuned circuit returns a ringing signal at the previous frequency, which beats with the new frequency. A mixer converts this beat to a (fixed) intermediate frequency, which is amplified and rectified. Under control of the same clock, the output of the rectifier is gated to an appropriate integrator which inputs the recording apparatus that tabulates the system score." In short, this is a very complex kind of circuit, but one which, nevertheless, has some promise. Indeed, SRI says about it: "The system can be built from available components with a reasonable probability of meeting performance requirements."

This concept has not been tested, but SRI feels quite confident about its possibilities.

A second kind of approach has been studied, using ultrasonics. A sound generating device could be located on the magazine and energy for generating the sound would be produced by the reader's movement of the magazine. The sound generating device would be a small sheet of metal about .001 inches thick which has dimples in it or a clapper. When the page is bent, ever so slightly, the sheet will emit an ultrasonic tone. These sheets can be constructed so that each title and each date emit a distinctive frequency.

The clapper device would have a diameter of about 1/7 inch (approximately 3mm). and could be attached to the corner of a page. Laboratory tests of the concept indicate that it is a feasible device, produces a loud enough signal to be detected, and appears to be capable of meeting cost and performance goals.

IMPLICATIONS

Our original concept was for a device which would measure readership unobtrusively. We have concluded that this is impossible. We must have some kind of recording device attached to the respondent, perhaps as small as a wrist watch. How, then, could we use such a system of devices?

We believe that equipping a national sample of people and every copy of every magazine with devices is beyond consideration. Rather, we do see the possibilities of using these devices to develop calibration techniques. For example, we could study reader behaviour and readership claims and compare them; hopefully we should find a series of correction factors for the claims which could be applied. In order to do this, we could equip a sample of people in one community with such devices and with the co-operation of a number of publishers, equip every copy of a group of issues going to that community. After some period of time, we could question our panel of people about their readership, in one or more of the standard fashions, and we could compare their answers with what the recording device has registered.

In order to bring these two concepts to the point of manufacture will cost of the order of $300,000 beyond the major amount we have already expended. At that point, one could be chosen. Then, production models would have to be designed and manufactured, and this would cost at least the same amount. Then, we could design and conduct the calibration studies to which we have referred.

We invite anyone's interest and participation in further development. If those who are seriously interested in co-sponsorship of further work, will contact us, we will discuss future arrangements in this area.

REFERENCE

Baer JA, Clark CB, Eckerle J, Edson WA, and Greenman WF. (1982). *Objective means of determining magazine readership*. Final report, July, prepared for Time Inc.; SRI International, Menlo Park, CA.