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Sample Administration With CATI: The Wisconsin Survey Research Laboratory's System

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Abstract: Automated sample administration is a major component of any fully developed computer-assisted telephone interviewing system. The Wisconsin Survey Research Laboratory's (WSRL) CATI sample administration package contains three categories for storing telephone sample numbers, four processing categories, and a supervisory review category for numbers in need of intervention to determine their callback status. A detailed call result code entry made by production interviewers at the end of each call will send a sample number to one of these categories.

Information from a call box that accompanies the call result code is used by field supervisors when they review sample numbers associated with refusals or callback appointments or restrictions and schedule these numbers for further dialings. A frequency distribution of the final call result codes given to all numbers in the assigned sample is used by WSRL to compute response rates.

Key words: Telephone surveys; CATI systems; sample administration.

1. Introduction

Automated sample administration is a vital component of any fully developed computer-assisted telephone interviewing (CATI) system. Even a highly sophisticated CATI sample administration operation, however, requires supervisory review of some call results and personal rather than computer assignment of selected callbacks, as is discussed below.

The CATI sample administration procedures described here have been refined during ten years of CATI experience and are now simply regular operational features of the Wisconsin Survey Research Laboratory's (WSRL) telephone production interviewing environment. Since its first CATI survey was completed in 1978, the laboratory has undertaken about 200 such projects, including 39 done during the fiscal year 1987–88 when approximately 100 000 sample telephone numbers were processed. The samples for these projects were based both on list (or name) designs and random digit dialing (RDD) designs that employed either the Waksberg-Mitofsky model (Waksberg (1978)) or WSRL's own disproportionate stratified RDD model (Palit and Sharp (1987)).

Currently, the Survey Laboratory maintains a telephone interviewing center on the

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campus of the University of Wisconsin-Madison with 22 production interviewing stations and a supervisory monitoring station. Each production interviewing station is equipped with a microcomputer which is networked with all other stations and a host microcomputer. Field shift leaders or supervisors or, usually, both are always physically present in the telephone center during production interviewing.

In the WSRL micro-based CATI system, the interview schedule is processed by each individual interviewer's microcomputer, while the sample for a given project is administered for all interviewers by the host microcomputer. An earlier version of the total WSRL CATI system is described by Palit and Sharp (1983). The software for this system is copyrighted by Computer-Assisted Survey Systems (CASS) and is currently in use by several computer-assisted interviewing facilities.

The present paper complements Weeks (1987) which reviews the general capabilities and methods of CATI sample administration as now used by six academic and governmental survey units in the United States. Weeks points out that: "With one exception..., the literature is mute with regard to substantive descriptions of CATI call scheduling" (Weeks (1987)). The exception is an early CATI paper that discusses computerized sample administration as carried out in the classic California disabilities survey completed by the Survey Research Center at the University of California at Berkeley (Nicholls (1978)).

All automated sample administration systems are based on a numeric call result code which production interviewers assign to each sample number at the end of every attempt to reach a respondent. In the WSRL system, this call result code is a detailed two digit sequence of 71 categories which proceeds logically through nine major first digit stages from nonworking numbers (for RDD samples) to callbacks for missing information on completed interviews. Because the proper functioning of the sample administration system is completely dependent on the correct use of this code, all WSRL interviewers receive a considerable amount of training in the code's application. An interviewers' manual, prepared specifically for training in the use of the call result code, is available on request to WSRL (Sharp (1985)).

The goal of all computerized sample processing systems, of course, is to automate as many as possible of the large number of callback decisions that must be made as a sample progresses during production interviewing. WSRL does this through the interviewer call result code entry and the use of a sample processing software package that consists of three sample storage categories and four processing categories. An additional CATI sample administration category represents the inevitable "Supervisory Review" destination for those sample numbers where, in effect, the best efforts at automation in scheduling a callback have failed and supervisors must intervene to make decisions for the computer. All categories are linked by the software to production interviewing.

2. An Overview of the Sample Administration Components

The eight basic sample administration categories and two other important components of the system are broadly defined in this section to provide an overview of the system's operational features. Sections 3, 4 and 5 of the paper present a more detailed picture of the characteristics of each category.

2.1. The eight basic software categories

1. Unworked sample: Telephone numbers from a random digit dialing or list (name) sample that have never been called.

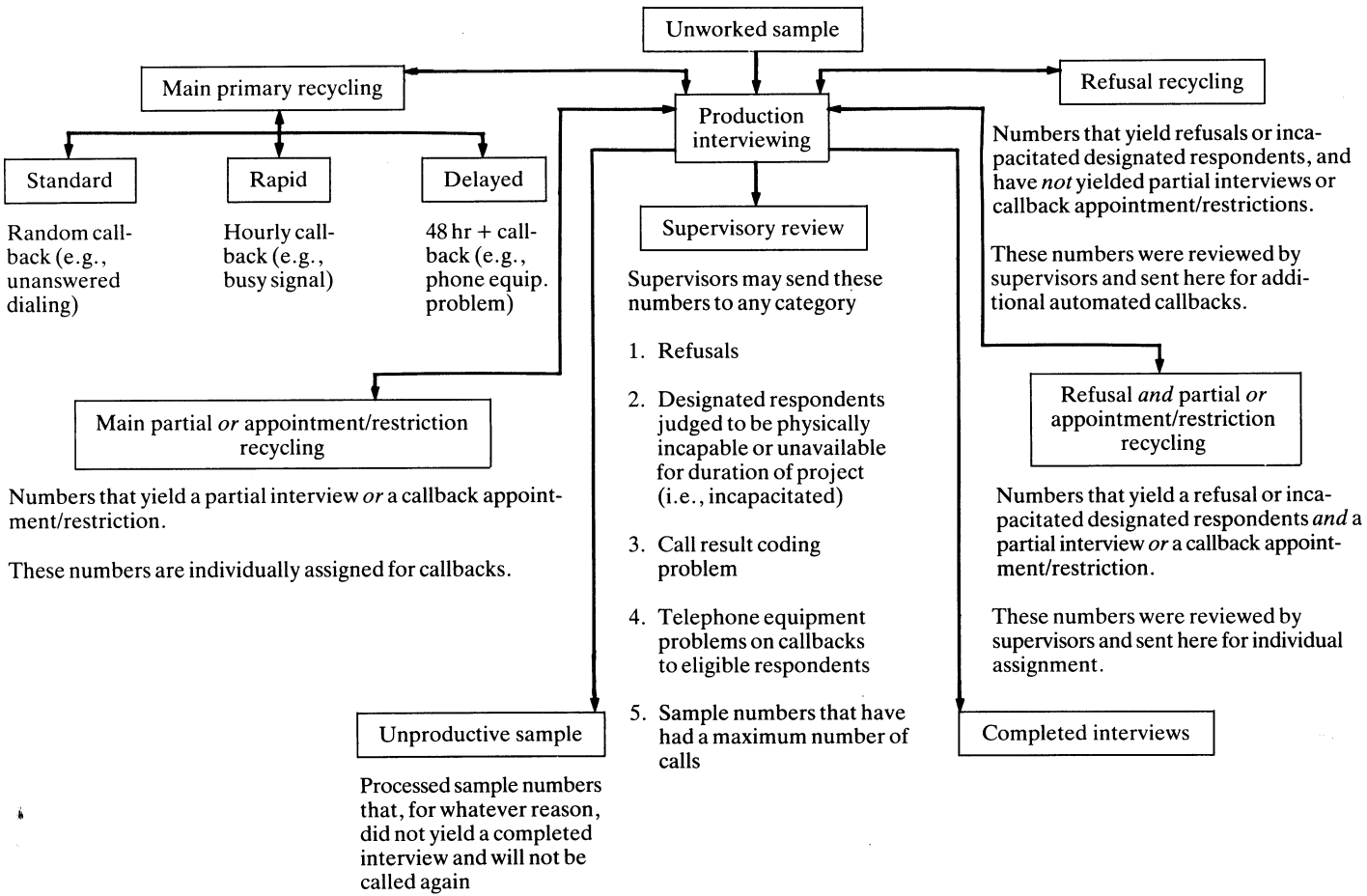
2. Unproductive sample: Sample numbers that, for whatever reason, did not yield a completed interview after going through the system, and will not be called again.
3. Completed interviews: Sample numbers that yielded completed interviews.
4. Main primary recycling: Sample numbers that have been dialed and have not yielded a refusal, a callback appointment/restriction, or a partial interview. This category has three subcategories: (a) standard processing, usually represented by numbers whose original dialings were unanswered, (b) rapid processing, the destination of numbers in the general category that receive busy signals when dialed, and (c) delayed processing, a subcategory for sample numbers in the general category of primary recycling numbers that experienced some kind of telephone equipment problem when dialed.
5. Main partial or appointment/restriction recycling: Sample numbers that have yielded either a partial interview or a callback appointment/restriction, but no refusal to be interviewed. Such numbers are sent to this category by the computer system.
6. Refusal recycling: Sample numbers that have yielded either refusals or designated respondents who were judged as physically unable to be interviewed; in addition, no appointments for a callback or callback restrictions have been placed on these numbers and no interview has been started. All refusals are reviewed by supervisors and those which meet the above criteria are sent to this category for automated processing by refusal specialists if it is felt that an additional callback has a chance of producing a completed interview.
7. Refusal and partial or appointment/restriction recycling: Sample numbers that yielded either refusals or designated respondents judged as physically unable to be interviewed, *and* either partial interviews *or* a callback appointment/restriction. After review, supervisors have decided that a refusal specialist should make additional callbacks on these numbers.
8. Supervisory review: The destination of sample numbers that cannot be processed automatically by the sample administration package because of ambiguities in their callback status. Five basic types of ambiguities will automatically send a sample number to this category: (a) refusals, (b) designated respondents who have been judged as either physically incapable of being interviewed or unavailable to be interviewed for the duration of the survey, (c) interviewer problems with the call result code, (d) telephone equipment problems on callbacks to eligible respondents, and (e) sample numbers that have reached a maximum number of callbacks.

   After reviewing each telephone number individually, supervisors can either send the numbers in this category out of the processing system to the unproductive sample category or to any one of the appropriate processing categories. No production interviewer can call a sample number directly from supervisory review.

2.2. *Provision for additional call result data from the call box*

Although fully computerized sample processing is completely dependent on the two digit call result code entry, other important information about each dialing of a sample number is found in a "call box" that travels with the number on its journey through the system. Thus, for every call, the following information is recorded: the date and the time at which the call began and ended; an identification of the interviewer who made the call; the call result code itself; and textual com-

Flow chart of the WSRL CATI sample administration system



ments from the interviewer that relate significant aspects of the result of the dialing (e.g., the strength of the refusal and who gave it; the reason a designated respondent was judged as physically unable to be interviewed; the time of an appointment for a callback and who made it; the nature of a restriction on a callback, such as "call back only on Saturday mornings," or "only a female interviewer should call back;" best times for a callback, if they are given; and, in the case of partial interviews, the number of the last question that was answered).

The call box comments are often critical in the decision on whether to make further callbacks on a given sample number. In addition, because the call box presents the complete log of all attempts to complete an interview at that sample number, production interviewers are required to read the call box information carefully before initiating a callback.

2.3. Use of paper cover sheets

The WSRL CATI sample administration package also includes the limited use of paper cover sheets that duplicate the call box information entered in the computer for sample numbers that produce partial interviews or appointments/restrictions on callbacks, or both. When field supervisors use the paper cover sheets to assign these numbers to production interviewers for callbacks, the interviewers access the proper sample processing category and bring the designated sample numbers to their computer screen. Various fully automated procedures were tested to handle callbacks to complete partial interviews and appointment/restriction callbacks, but none of them proved to be as efficient as the use of the paper cover sheet and supervisory assignment method.

2.4. Overview summary and the sample administration flow chart

The eight CATI sample administration categories, in combination with the call box and the use of paper cover sheets, may appear to be overly complicated and – too often – to defeat the goal of automated sample administration. Nevertheless, it must be emphasized that the great majority, well over 90 %, of the numbers in WSRL's telephone samples simply follow a route from unworked sample to production interviewing and then either to a storage category (unproductive or completed) or to fully automated main primary recycling. If the number goes to automated main primary recycling, most numbers stay in a main primary recycling-production interviewing pattern for callbacks. Many things can happen, however, when a designated respondent must be contacted by telephone, and the complete sample administration package must provide for all contingencies.

The function of each of the sample administration categories as sample numbers pass through them and out of the system during production interviewing is the focus of the following two sections of the paper. The text may be clarified by referral to the flow chart found on the next page. Only automated links are shown by lines in the chart. After individual review, field supervisors have the ability to place sample numbers in any appropriate sample administration category.

3. The Sample Storage Categories

The three sample storage categories serve as holding tanks in the sample administration system, one for numbers that have not yet started through the process and the remaining two for those sample numbers that have completed the process and are no longer the concern of production interviewers.

3.1. The unworked sample

All sample numbers that have never been dialed are stored in the unworked sample category as directed by the WSRL Sampling

Section. This category contains the starting sample and all additions through supplemental or sequential sampling. After logging into the computer for a particular project, production interviewers access the unworked sample and bring new sample numbers to their terminals when requested. The rate of mix of numbers between this category and the main primary recycling category is established by the Sampling Section according to the current needs of each particular survey.

If a sample number arrived in production interviewing from the unworked sample and requires callbacks, the entry of a call result code will automatically send that number to main primary recycling, to main partial or appointment/restriction recycling, or to supervisory review. If no callbacks are to be made, that sample number is removed from the system and stored in either the unproductive sample or in the completed interview category.

3.2. *The unproductive sample*

The unproductive sample category is used by the system to store sample numbers that, while not yielding completed interviews, have completed their processing journey and will not be called again. A sample number is automatically sent to the unproductive sample, for example, when it receives a call result code indicating that it is not, or is no longer, associated with the primary telephone in a residence containing an eligible respondent. This destination is often the fate of a very large proportion of the original random digit dialing screening sample.

Only those sample numbers that reach production interviewing from the unworked sample or from main primary recycling may be sent automatically to the nonworking sample. In addition to the computerized processing, however, any sample number may be placed in unproductive sample storage if a supervisory review decides that further dialing to that telephone is not advisable (e.g., two contacts have produced two strong refusals).

3.3. *Completed interviews*

The entry of a call result code indicating the interview has been completed will send a sample number to the second storage category for those numbers that will not return to the processing system. Completed interviews are subject to further review before this status is permanently established, but they are removed from the sample administration system by placement in this category.

When, after review, callbacks for missing information are required on interviews previously coded as completed, these callbacks are scheduled by field supervisors using paper cover sheets. All data produced by these callbacks are recorded on paper and later entered in the computer.

In their review of partial interviews (see below), supervisors may decide that the essential criteria established for completed interviews have been met. If this occurs, the partial is not replaced in a processing category but redefined and placed in the completed interviews category.

4. The Sample Processing Categories

The four sample processing categories deal with sample numbers that require callbacks either to clarify their eligibility status or to complete an interview.

4.1. *Main primary recycling*

Sample numbers requiring callbacks are automatically sent to main primary recycling and are automatically returned here after a callback if the computer system determines that no refusal has occurred and no appointment has been made for or restriction placed on a callback to start the interview.

Many sample numbers that arrive in production interviewing from the unworked sample are automatically transferred to main primary recycling processing after the first call. In addition, a sample number may be sent here after supervisory review.

The main primary recycling processing category is itself organized into three subcategories to allow callbacks to be made at different intervals depending on the result (i.e., the call result code) of the last call made to the sample number that is to be recontacted.

4.1.1. Main primary standard recycling
This subcategory processes those sample numbers that can be called anytime during production interviewing hours to determine residential status or to start the interview. That is, earlier contacts produced no information that could be used to schedule callbacks on these numbers for designated times. The major component of this subcategory consists of those numbers that were not answered when dialed.

Because of the high cost of daytime telephone calls and the lower chances of finding someone at home in the daytime, sample numbers in main primary standard recycling are generally called during weekday evening hours and throughout Saturdays and Sundays. The first numbers to enter the main primary standard recycling are the first numbers accessed by the interviewers.

If a given survey requires that the standard recycling subcategory be worked during a weekday, WSRL can activate a special processing program that establishes morning, afternoon, and evening divisions within the subcategory. Using this feature, a sample number is sent to production interviewing during the morning and the new call result code returns the number to standard recycling, and it will appear on an interviewer's computer screen in the afternoon. The movement from morning to afternoon to evening and back to morning continues automatically. The sample numbers in each of these divisions are also ordered so that the first numbers that are sent to these divisions are the first numbers that the interviewers call, i.e., the first in, first out principle.

As with all sample processing categories, if a sample number accessed from main primary standard recycling appears on the production interviewer's computer screen at a time when it should not be called (as indicated in the call box data obtained on previous attempts), a "pass over" code is entered as the call result by the interviewer and the number is returned to the category of origin without being dialed at that time.

4.1.2. Main primary rapid recycling
Rapid recycling is provided to those sample numbers that could be called back anytime to determine residential status or to start an interview but the last contact produced a busy signal that at least increases the chances of having the call answered if it is made after a comparatively short wait. Operator messages that all circuits or lines are busy will also send these sample numbers to rapid processing.

The rapid recycling subcategory is empty at the start of every interviewing day. At the end of the first sixty minutes of production interviewing and at sixty-minute intervals throughout the working day, rapid recycling sample numbers are given priority status for next calls. At present, no time tag is maintained on individual numbers. Following the first in, first out principle, the entire subcategory is recycled every sixty minutes. All numbers in rapid recycling at the end of every production interviewing day are merged with those in the standard subcategory. (If a number which had yielded a busy signal produces an unanswered ring on the next call, it is then automatically sent to standard recycling.)

Granted that a telephone may be inadvertently off the hook, a busy signal is still fairly good evidence that someone will answer the telephone if a callback is made after a delay of one hour. While it is important to take advantage of this knowledge, WSRL has found that recycling numbers that produce busy signals more often than every sixty minutes

quickly brings too many such sample numbers to the maximum number of contacts permitted before supervisory review is required.

4.1.3. Main primary delayed recycling

The sample numbers in this subcategory could be called back at any time, but the result of the last dialing indicated that they were associated with inoperative telephones. The conditions that caused these telephone equipment problems, however, could be temporary and may be corrected when the numbers are later redialed. Examples are calls that produce "out of order" messages, bad connections, etc.

Delayed processing sample numbers are accumulated without a time tag on individual numbers. Periodically (usually every two or three days) during production interviewing, at the request of the Sampling Section, the numbers in this subcategory are returned to production interviewing through standard recycling.

4.2. Main partial or appointment/restriction recycling

Sample numbers requiring callbacks are automatically sent to main partial or appointment/restriction (main P or A/R) recycling and are automatically returned here after a callback if the computer system determines that no refusal has occurred and either the interview has been started or an appointment/restriction has been placed on a callback. Thus, the main primary recycling category processes nonrefusals that have not resulted in partial interviews and have never had a callback appointment or restriction. The main P or A/R recycling category processes nonrefusals that have yielded partial interviews or call results for which individualized call scheduling is needed.

Examples of call results that will send a sample number to partial or appointment/restriction recycling are: interviews that were started but ended before completion because the respondent had to keep an appointment; callbacks that are restricted in that they can be made only on a given day of the week; an appointment for an interview at a specific date and time, etc.

All P or A/R recycling sample numbers are associated with paper cover sheets, as discussed earlier. Field supervisors assign these cover sheets at appropriate times to production interviewers who then retrieve the designated sample numbers to their computer screens and proceed with normal CATI interviewing procedures.

Although many sample numbers that yield partial interviews may be recontacted virtually anytime, these numbers are scheduled by supervisors because of the importance WSRL places on them. Respondents have already been identified and they have provided some information. The "payoff" for these sample numbers is high, as is the time and effort already invested, and WSRL feels they are worth the special attention that is provided by supervisory assignment of callbacks.

Only sample numbers that were sent to production interviewing from either the unworked sample or main primary recycling can automatically be transferred to main P or A/R recycling. In addition, however, any sample number may be sent here after supervisory review.

Once in main partial or appointment/restriction recycling, a sample number is automatically returned here from production interviewing if it either does not become a completed interview or is not sent to supervisory review. None of these numbers can automatically be sent to any other processing category or to the nonworking sample.

4.3. Refusal recycling

The refusal recycling processing category contains sample numbers that are associated with refusals to start an interview or with a

designated respondent who is judged to be either unavailable or incapable of starting the interview for the duration of the survey. No sample number can be located in refusal recycling until it has first been through supervisory review and that review had determined that additional callbacks should be attempted. These sample numbers can be called randomly, but the interviewing is done by refusal specialists who are instructed to access this category by field supervisors.

When sent to production interviewing from refusal recycling, a sample number may automatically be transferred to: completed interviews, refusals and partial or appointment/restriction recycling, supervisory review, or returned to refusal recycling. If any of these sample numbers receive a second refusal or an incapacitated respondent call result code, it is again sent to supervisory review.

Those callbacks on sample numbers in refusal recycling that are, for any reason, unanswered are automatically returned to refusal recycling. Also, even if a callback on a sample number sent to production interviewing from this category is answered and does not produce a refusal but rather an indication that the next callback can be made without an appointment or restriction, that number also is automatically returned to refusal recycling. This action allows all sample numbers associated with refusals to receive special consideration throughout production interviewing.

4.4. Refusal and partial or appointment/ restriction recycling

Refusals that are associated with partial interviews or appointments or restrictions on callbacks or both are classified in the refusal P or A/R recycling. (It is not unusual for a recontact on an original refusal to result in an appointment for a third contact to obtain the interview.) As with main P or A/R recycling, all interviewer assignments to refusal P or A/R recycling are made through paper cover sheets, and normal CATI procedures are followed after the refusal specialist brings a refusal P or A/R number to the computer screen.

A sample number that is associated with a respondent who started the interview but refused to complete it is automatically sent to supervisory review. If that review indicates that callbacks should be attempted, the number is placed in refusal P or A/R recycling. Any other sample number that field supervisors feel can best be handled by the personalized scheduling available in refusal P or A/R will also be located here.

In addition, those sample numbers that are sent to production interviewing from refusal recycling but, when called back, receive appointments or restrictions for further contacts – including partial interviews without refusals to finish – are automatically transferred to refusal P or A/R processing.

Any sample number sent to production interviewing from refusal P or A/R processing is returned here by the computer if it either does not become a completed interview or is not sent to supervisory review. In this way, all callback appointments or restrictions that were obtained after a refusal, and even callbacks to complete interviews that were started after original refusals, can receive close supervisory attention throughout production interviewing.

5. Supervisory Review

The four sample processing categories just discussed deal primarily with the scheduling of additional callbacks when the problem of interpreting information provided by completed calls to eligible residences or to selected respondents is not an issue. The supervisory review category is the temporary repository of those sample numbers that cannot be processed efficiently and automatically by computer through WSRL's system of numeric codes alone.

As described earlier, the call box information containing the result code itself, and – most importantly – the textual comments of the production interviewer associated with that call result code, provides the basis for supervisory decisions on scheduling callbacks on these sample numbers. Although the review process is obviously more costly in time and money than completely automatic computer processing, the proportion of an original random digit dialing sample that requires any kind of supervisory intervention will almost always be less than one-tenth.

Again, sample numbers that arrive in production interviewing from any of the four processing categories may be sent to supervisory review after the callback. Depending on the review decision, a given sample number may be placed in any of the processing categories for further callbacks or it can be sent out of the system either to the unproductive sample or as a completed interview.

The supervisory review category actually consists of five subcategories, each of which may be accessed separately from the other four: 5.1. Refusals, 5.2. Incapable and unavailable designated respondents, 5.3. Call result coding problems, 5.4. Telephone equipment problems on callbacks to designated respondents, and 5.5. Maximum number of calls.

5.1. *Refusals*

This review subcategory puts into groups those sample numbers associated with contacts that result in refusals to start or to continue an interview. Textual interviewer comments from the call box of each sample number are carefully analyzed by field supervisors to determine if callbacks should be made. If a given refusal is judged as adamant and, therefore, that further callbacks would be fruitless, that sample number is transferred to the unproductive sample category.

Callbacks are made on these sample numbers if the refusal is judged to be equivocal. Supervisors will place the sample numbers for refusals that they determine should be recalled in the refusal recycling category if the interview had not been started and if the callback can be made without an appointment or restriction. If a partial interview had been obtained, however, or if a callback appointment or restriction is in force, the sample number will be placed in refusal P or A/R recycling for further processing.

5.2. *Incapable or unavailable designated respondents*

This review subcategory is the first automated destination of sample numbers that produce designated respondents who are judged to be physically incapable of being interviewed or unavailable for the duration of the survey (e.g., out of the country).

In many respects, these sample numbers are handled much as the refusals (see above). Each number is reviewed by supervisors and if, after a study of the call box data, the reviewer agrees with the original determination, that number is sent out of the sample administration system to the unproductive sample. If, however, for such sample numbers where the reviewer feels a callback could reasonably be expected to yield a completed interview, the numbers are sent to refusal recycling or to refusal and partial or appointment/restriction recycling – depending on whether the interview had been started or an appointment/restriction had been placed on a callback.

5.3. *Call result coding problems*

Sample numbers that receive any two digit number as a call result that is not recognized by the processing system are automatically sent to this subcategory. Interviewer comments associated with these contacts are used by field and sampling supervisors to recode

the last call result and to reassign each sample number to an appropriate category in the processing system.

In addition, sample numbers that, when called before residential status is established, receive a call result code indicating that the telephone number has been changed are automatically transferred to the problems subcategory. If a random digit dialing sample is being processed, these numbers are placed in the unproductive sample. If the survey uses a name sample, however, and the new telephone number is known, the new number is entered in the processing system.

Finally, those problem sample numbers that are difficult for the production interviewer to classify are brought to supervisory attention by the use of a special call result code entry. That number is sent to the coding problems subcategory in the processing system.

5.4. Telephone equipment problems on callbacks to eligible respondents

Sample numbers associated with callbacks to reach known eligible respondents that result in some problem with the telephone itself are grouped for supervisory review in this subcategory. Many of these sample numbers could be automatically transferred to the unproductive sample. But, such great value is placed on each potential respondent that each instance of failure to reach previously operating telephones is given individual attention and, perhaps, dialed again under supervisory rather than automated scheduling.

The telephone problems subcategory in supervisory review consists of: numbers that will probably become part of the unproductive sample (disconnects, unoccupied residence); numbers that will be recontacted after a short delay (fast-tone busy), out of order or call did not go through messages, and bad connections); and notices that the telephone number has been changed (if known, the new telephone number is always called in an attempt to reach the eligible household or designated respondent, if the respondent had been selected on a previous call).

Again, while many different call result codes will send a sample number to telephone problems supervisory review, only a relatively small proportion of the total working sample is ever placed in this subcategory.

5.5. Maximum number of calls

This final subcategory of the supervisory review category provides for the automatic grouping of all sample numbers that have been called a specified number of times. Sample numbers may be sent to maximum calls review from each of the four processing categories. A limit on the number of calls permitted without a review is necessary to avoid a large number of unproductive callbacks being made on a given sample number simply because of repeated computer scheduling.

The maximum number of calls permitted before initiation of the review process is a policy decision that can be influenced by the progress of a given survey and the field experiences of a given sample. Usually, WSRL sets a maximum limit at between six and ten dialings. (As indicated earlier, the CATI "pass over" code, used by production interviewers when a sample number appears on the computer screen at a time when that number should not be dialed, is not counted as a call.)

Any sample number in this subcategory, that supervisory review indicates should not be called again, is sent out of the processing system to the unproductive sample. If, however, after the examination of the call history of a sample number, it is decided that callbacks beyond the stated maximum should be made, that number may be relocated in any of the four processing categories.

Generally, sample numbers that are to re-

ceive further callbacks are sent to either main P or A/R recycling or refusal P or A/R recycling so that paper cover sheets may be used, and assigned by supervisors. Production interviewers then access the designated categories and bring these numbers to their computer screens for at least one more dialing. This procedure assures that these contacts will be made only at those times having the highest probabilities of success, including daytime calls if none had been previously made.

Repeated attempts to clarify the status of sample numbers that are never answered, always produce busy or fast-tone busy signals, invariably result in bad connections, etc., are sufficient reasons to retire those numbers from production interviewing if supervisory review decides that another condition is met: the callbacks must be dispersed over at least one week and throughout the morning, afternoon, evening, and weekend hours.

Sample numbers associated with either eligible residences or designated respondents that have had the maximum number of calls are given special supervisory attention before being scheduled for additional callbacks. Some designated respondents seem to be unable to refuse an interviewer, but would not grant the interview if contacted twice daily for the indefinite future. All interviewer comments associated with any sample number reaching this subcategory are used, together with the data on time and date of earlier calls, to decide if and when another callback should be attempted. The review process is generally done through the use of a computer screen although hardcopy printouts of call result histories may be employed.

Those sample numbers that receive a callback beyond the maximum number and are then returned to the supervisory review category are reviewed for a second time. Most of them will now be sent to the unproductive sample storage category, but the supervisor may decide that yet another callback should be made, in which case the callback and, if necessary, review cycle will be repeated.

6. Final Call Results and Response Rates

At the end of the production interviewing stage of a survey, the final call result codes given to all assigned sample numbers are grouped in a frequency distribution by a CATI subprogram and response rates are computed. WSRL computes both high and low estimates of the response rate (wherein none or all of those numbers that were never answered are assumed to be associated with eligible respondents) and the CASRO measure that assumes that all such sample numbers are distributed between known eligible and known ineligible numbers in the same proportion as exists in all eligibility status known numbers in the assigned sample (CASRO (1982)).

7. Summary

Computer assisted telephone interviewing is highly acclaimed for the assistance it provides the interviewer in processing the interviewing schedule. And certainly, the interviewer's task is tremendously eased by the complete automation of: contingency choices in the flow of the questions; randomization of question order; recall of respondent answers from earlier to later points in a given interview or even in panel surveys from another interview; the prohibition of illegal or wild code entries; and so forth.

But when WSRL interviewers and field supervisors were asked what one aspect of the CATI system they liked best in comparison to the pencil and paper method, CATI's automated sample processing ability was selected. Automated sample processing as described here minimizes the amount of paper handling (in the form of cover sheets with sampling information).

RDD samples that involve screening for a relatively small proportion of the general population may require a very large original sample and, without CATI, each sample number would have to have its own cover sheet containing its own call record. With paper and pencil surveys, interviewers' desks were often covered with stacks of paper cover sheets. A considerable amount of the time interviewers and field supervisors spent then in what should have been production interviewing and quality control was really paper shuffling to make sure the sample was being processed as it should be, and as each replacement interviewer or supervisor came on for the next shift, the paper cover sheets were reshuffled.

The CATI sample processing system explained here relieves interviewers and field supervisors of all the routine decisions involved in administering an RDD sample or a name telephone sample. Nonetheless, supervisory decisions are not eliminated altogether in the WSRL sample processing system. Supervisors are still required to review problem contacts of any kind that WSRL felt a computer should not be asked to classify, because of the conviction that selective personal attention will enhance the probabilities of a successful outcome (i.e., a completed interview).

8. References

CASRO (1982): A Special Report of the CASRO Task Force on Completion Rates. The Council of American Survey Research Organizations, June, 1982.

Nicholls, W. II. (1978): Experience With CATI in a Large Scale Survey. American Statistical Association, Proceedings of the Section on Survey Research Methods, pp. 9–17.

Palit, C. and Sharp, H. (1983): Microcomputer-Assisted Telephone Interviewing. Sociological Methods & Research, 12, pp. 169–189.

Palit, C. and Sharp, H. (1987): Strategies in RDD Sampling. A paper presented at the International Conference on Telephone Survey Methodology, Nov. 8–11, 1987.

Sharp, H. (1985): The Wisconsin Survey Research Laboratory's Telephone Call Result Code: A Numeric System for Sample Processing. WSRL.

Waksberg, J. (1978): Sampling Methods for Random Digit Dialing. Journal of the American Statistical Association, 73, pp. 40–46.

Weeks, M. (1987): Call Scheduling With CATI: Current Capabilities and Methods. A paper presented at the International Conference on Telephone Survey Methodology, Nov. 8–11, 1987.

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