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**TELESCOPING EFFECTS AND SURVEY NONRESPONSE IN THE NATIONAL
CRIME VICTIMIZATION SURVEY**

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Abstract

The National Crime Victimization Survey (NCVS) is the primary source of information on the frequency, characteristics, and consequences of criminal victimization in the United States. The NCVS was initiated in 1972 because official sources of crime statistics were deemed inadequate to measure the extent and nature of the Nation's crime problem as it existed at the time. Victim surveys are subject, as are all surveys, to a variety of non-sampling errors, including those related to memory failure and survey nonresponse. The paper discusses the procedures developed for the NCVS to address telescoping, which is one form of memory failure, as well as survey nonresponse. Also discussed is the degree to which telescoping and nonresponse have impacted survey results and planned revisions to the survey's bounding procedures.

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Introduction

1. The National Crime Victimization Survey (NCVS) is the primary source of information on the frequency, characteristics, and consequences of criminal victimization in the United States. The NCVS was initiated in 1972 (as the National Crime Survey, or NCS) because official sources of crime statistics were deemed inadequate to measure the extent and nature of the Nation's crime problem as it existed at the time.

2. Victim surveys are subject, as are all surveys, to a variety of non-sampling errors, including those related to memory failure and survey nonresponse. The purpose of this paper is to discuss telescoping, a form of memory failure, and survey nonresponse, two methodological issues that confront victimization surveys; their impact upon National Crime Victimization Survey (NCVS) estimates and the nature of NCVS procedures implemented to address them. Each of the issues will be discussed in turn.

1. Telescoping

3. Telescoping is one aspect of respondent failure to correctly remember information about events that they have experienced. Telescoping is temporal memory failure; placing an event at a time it did not actually occur. Telescoping may be both forward or backward, either remembering the event as occurring more recently or less recently than it actually occurred. For retrospective surveys, including victimization surveys, that utilize a reference period to produce measures of incidence or prevalence, telescoping may be internal, moving the event to another time within the period; or external, incorrectly moving it either into or out of the reference period. Of the two, the impact of external telescoping is of more concern when attempting to make estimates of the extent of victimization during a calendar period.

4. Telescoping has been observed in studies in various disciplines. According to Skogan (1981), respondents in a 1950's study of British civil servants found that they often misremembered when they took sick leave, and another study found that people tended to report household repairs being made more recently than they actually had been made. In studies conducted during the planning for the National Crime Survey (NCS), (renamed the National Crime Victimization Survey during a redesign in the early 1990's), external telescoping, usually the tendency to bring incidents occurring prior to the reference period into the reference period, were found to be significant. A 1970 reverse record check study in Washington, D.C. used a sample of crimes reported to police during the 7 months prior to the interview. The study found that about 15 percent of the crimes reported by respondents that actually took place outside the study's six month reference period were remembered as having occurred during the reference period (Skogan, 1981 p 20).

5. To address the potential impact of telescoping on victimization estimates the developers of the National Crime Survey incorporated a procedure called "bounding". Bounding is a technique in which the information collected from each interview is compared with information collected during previous interviews to ensure that the earlier reported victimizations are not double counted.

6. This procedure was enabled by the survey's panel design. The NCVS¹ is administered to households residing in a sample of addresses every 6 months for three years for a total of seven interviews. The survey collects information on crimes committed during the 6 months prior to the interview. After seven interviews, addresses are rotated out of the sample and are replaced by new households (addresses). The survey denotes each enumeration period as a "time in sample" or TIS. Thus, TIS-1 households are in the sample for the first time and TIS-7 households are in the sample for the last time. The sample is designed so that in any month about the same proportion of households is interviewed for the first time, second time, etc. Interviews at TIS-1 households are called the "bounding interviews." These interviews are used solely to prevent telescoping during subsequent interviews and are not used for estimation purposes. Published NCVS estimates are based on TIS-2 through TIS-7 interviews.

7. After completing an incident report for a reported crime, the interviewer inscribes information about all incidents reported by household members on a control card that is used during every enumeration of the survey as a record for each sample address. The interviewer then compares these incidents with any reported during previous interviews. If incidents appear to have similar characteristics, the interviewer asks if the incidents are the same. If they are, the interviewer documents this and changes the forms to reflect that this is a re-report of the same incident. Therefore, after the initial bounding interview all subsequent interviews for the household for the same respondents are bounded.

1.1. Forward and backward telescoping

8. Prior to the redesign, the NCS was subject to both forward and backward external telescoping. The bounding procedure addressed only the forward telescoping. Backward telescoping could occur because the survey's six month reference period began on the first day of the month six months prior to the interview month and ended on the last day of the month prior to the interview month. (Figure 1) Because interviewing was conducted during a two to three week period each month, it was possible that there could be up to a three week period prior to the interview outside the reference period during which the respondent could be victimized. Backward telescoping would occur if these were reported as occurring during the reference period. Alternatively, they could be forgotten and not reported during the subsequent interview.

9. When the survey was redesigned in 1992, a new procedure, "period to period recounting" was introduced to eliminate the problem of backward telescoping. Under this procedure, the survey's reference period ends on the day prior to the day of interview, rather than the last day of the month prior to the month of interview. (Figure 2) Incident reports for incidents occurring during the month of interview are filled and held in reserve until the next enumeration. In addition, the next reference period begins on the date of the previous interview. For example, for households interviewed for the first time on January 8, 2005, the reference period would begin on July 1, 2004 and end on January 7, 2005. Incidents reports would be filled for incidents occurring between January 1 and January 6, 2005 and would be held until the enumeration in July 2005, perhaps on July 3. The reference period for this interview would be January 7, 2005 to July 2, 2005. This procedure eliminates the possible of backward telescoping.

¹ To be concise, unless otherwise noted, references to NCVS methodology also include that of the NCS.

1.2. Unbounded interviews included in estimates

10. While initial interviews at each sample address are not used to produce estimates of victimization, not all TIS-2 through TIS-7 interviews are actually bounded. There are a number of reasons why such interviews may not be bounded, including:

- When a person “ages into” the sample. The minimum age to be an eligible respondent for the NCVS is 12 years old. If a household member turns 12 subsequent to TIS-1 his/her first interview is not bounded.
- When a family moves away from a selected household and is replaced by a new family. Information from the new family is unbounded for their first interview.
- When an individual (or a household) is not interviewed at one enumeration for some reason but is interviewed at the following enumeration.
- It may be that interviews following proxy interviews are not bounded. If the proxy interview was 100% complete and accurate, the data are bounded. If not, then the data are not bounded.
- When an address is added to the sample, either because of new construction or a sample redesign.

11. Analyses undertaken during the 1990’s indicate that about 83% of the TIS-2 through TIS-7 households, the interviews used in published NCVS estimates, are bounded; that is, were interviewed in previous enumerations (Winters, 1999).

12. Replacement households account for almost half of the unbounded interviews used in estimation (figure 3). As discussed above, the NCVS is an address based survey. Each enumeration period, interviews are conducted with whoever is currently living at the address. When a household moves out and is replaced by an in-moving household, the in-moving household constitutes a “replacement household”. These replacement households are interviewed and their data are used in estimates despite their being unbounded.

1.3. Impact of telescoping

13. Murphy and Cowan (1976), in a paper written three years after the NCS was begun, found that the use of bounding techniques played a significant role in negating the tendency of respondents to forward telescope incidents of crime they had experienced. Looking at data collected over 5 calendar quarters beginning in January 1974, Murphy and Cowan found that unbounded (i.e. TIS-1) households had a personal victimization rate (covering the crimes of rape, robbery, assault and thefts occurring away from home) about 44 percent higher than that of bounded interview households; those in TIS-2 through 7. For property crimes; burglary, motor vehicle theft and property thefts occurring at the residence, the unbounded interview households had a rate averaging about 40% higher than that of bounded interview households.

14. It must be noted that for their analysis, Murphy and Cowan ignored the unbounded interviews that occurred in TIS-2 through TIS-7 interviews. It is probable that had they considered these unbounded interviews as unbounded the differences in victimization rates between unbounded and bounded interviews would have been greater.

15. Murphy and Cowan assumed, as do most, if not all researchers who have examined the use of bounding to prevent telescoping, that the bounded data are more accurate; that is, closer to the “true” victimization rate than are the unbounded data. Of course, telescoping is but one of

the possible biases that can affect estimates from retrospective surveys. Data from panel surveys are subject to a number of possible problems and biases associated with repeated collection of data from subjects, including increased nonresponse and panel bias. Panel bias refers to the tendency for later waves of interviews to be less productive than earlier waves as respondents learn that positive reports will increase the interview time. Woltman and Bushery, (1977) found a negative relationship between victimization rates and the number of times respondents had been in sample. The largest declines, averaging between 4 and 10 percent for different offenses, occurred between the second and third interviews. The NCVS does not make any adjustments to compensate for any panel bias.

16. All of the research on the impact of telescoping cited above was conducted on the National Crime Survey prior to the survey redesign. Subsequent to the redesign, other studies have been undertaken to determine whether the impact of telescoping has changed given the number of cognitive changes in survey methods instituted during the redesign to assist respondents in recalling crimes they have experienced.

17. A 1999 analysis by Winters compared victimization rates constructed from TIS-1 households to those of TIS-2 households for three years, 1995-1997. The rates for personal crimes for TIS-2 respondents averaged about 13% higher than those for TIS-1 respondents. Surprisingly, for property crimes, TIS-2 households had rates that were about 15% *lower* than those of TIS-1 households. It is difficult to isolate the impact of telescoping in this analysis, however, because of the impact of computer assisted telephone interviewing (CATI). Some research has found that CATI produces higher estimates of crime victimization, due, it is believed, to the standardization of the interview process (Rosenthal & Hubble, 1993). TIS-1 households do not contain any CATI cases, while during the three years examined about 27% of TIS-2 through TIS-7 cases were interviewed using CATI after the redesign.

1.4. New Developments

18. After 33 years of maintaining a survey methodology that utilizes initial interviews with each sample case solely to bound future responses, the NCVS is now preparing to abandon that protocol. The NCVS bounding protocol is expensive, as about 14% of interviews are not used for estimation purposes. Moreover, these interviews are the most expensive to obtain, as initial contacts at each TIS-1 address must be conducted by personal visit. Subsequent contacts, including the initial contacts with TIS-2 through TIS-7 households may be initiated by telephone if acceptable to the respondents.

19. Decreasing financial resources and increasing survey costs have forced the Bureau of Justice Statistics to plan for the abandonment of the bounding interview. Research is now being conducted to assess how best to implement this change, which will encompass using TIS-1 households for estimation and cutting the NCVS sample by 8-14%. Because it is important to maintain continuity with earlier estimates, the Census Bureau, which conducts the NCVS for BJS, is exploring the creation of adjustment factors to apply to the data to counter the increased inclusion of unbounded interviews in the sample used for estimation.

20. The Bureau of Justice Statistics is making these revisions extremely reluctantly, only after exhausting all other options. The crisis became critical this year because of increased costs of introducing a new sample after the last decennial census.

1.5. Summary

21. Research has demonstrated that retrospective surveys, including victimization surveys, are subject to respondent misremembering when events occur, and that this bias is primarily one of forward telescoping; bringing forward in time events respondents have experienced. The use of bounding interviews is one way, albeit an expensive way, to counter the impact of bounding, but only for panel surveys. Since most victimization surveys are cross sectional, bounding is not an option.

22. As described above, the patterns of telescoping have changed since the survey redesign, the result, in all probability, from the methodological changes instituted in the redesign. While the pre- and post-redesign studies of the impact of telescoping are not directly comparable, it appears that some of the methodological changes implemented in the redesign to help respondents remember incidents of crime, such as the improved screening of crime victimization, may also have had the effect of reducing the tendency to misremember when offenses occurred.

23. These methodological protocols, such as improved crime screening, and sharpening concepts of victimization for respondents may be useful to developers of victimization surveys regardless of whether or not they utilize a panel design that could accommodate bounding interviews.

2. Noninterviews

24. The basic sampling unit for the NCVS is the address. Subsequent to each U.S. decennial census, a sample of addresses is selected for the next 10 years. Addresses are introduced into the sample as others complete their three year rotation through the sample. Interviews are attempted with all persons age 12 and older residing at each sample address. For the NCVS, the term "household" refers to the person or group of persons residing in the sample address at the time of interview. Households residing at sample addresses may change over the three year period, but the address remains for the entire period.

2.1. Types of noninterviews

25. NCVS recognizes four types of noninterviews: Types A, B, C, and Z (Bushery, 1978).

Type A non-interviews refer to situations in which an entire eligible *household* is not interviewed. Households may not be interviewed for a variety of reasons: The interviewer is not able to contact anyone in the household during the two-to-four-week interview period; the household refuses to be interviewed, or the household is not reachable, for example, due to impassable roads. If the adult who provides basic information about the household, called the household respondent, cannot be interviewed, the entire household becomes a Type A non-interview.

Type B non-interviews occur when an address is vacant or occupied entirely by persons who have usual residences elsewhere. Although these cases are not eligible for interviews during the current enumeration period, they could become eligible at a later time. Additional reasons for Type B interviews are dwellings under construction and dwellings temporarily converted to businesses.

Type C non-interviews are sample addresses that are permanently ineligible for interview. For example, a housing unit may have been condemned, demolished or burned down, a house or trailer moved, or a house converted to a permanent business.

Type Z non-interviews are eligible *persons* not interviewed in an otherwise interviewed household. A household respondent can never be a Type Z non-interview. If the household respondent cannot be interviewed, the *household* is coded as a Type A non-interview.

26. Type A and Type Z interviews are of most interest because they represent eligible respondents not interviewed for the survey. Historically, the NCVS has obtained extremely high participation by respondents, and hence very low Type A and Z noninterview rates. During the 1970's, Type A rates averaged about 4%, and Type Z rates averaged about 1.5% or less (Love & Turner 1975). For most of the survey's history, Type A rates have remained below 5%. Since the early 1990's however, the Type A rate has climbed steadily, reaching about 9% in 2004² (figure 4).

27. The Type Z rate has seen a virtually continuous and increasingly steep increase across the survey's history. Surpassing the Type A rate in 1986, in 2004 the Type Z rate stood at 14.5% of eligible respondents in interviewed households.

28. The increases in nonresponse since 1990 are not unique to the NCVS among household surveys conducted by the U.S. Census Bureau. Every one of the 5 annual household surveys examined in one study experienced increases in Type A rates of 50% or more between the early 1990's and 2003. (Bates & Stoner, 2004). Of the 5 surveys, the NCVS had the lowest Type A rate in 1990. Despite experiencing the greatest percent increase over the period (150%), the NCVS still had the second lowest rate in 2003, surpassed only by the Current Population Survey, used primarily to measure unemployment (figure 5).

2.2. Deconstructing NCVS noninterview rates

29. As stated above, Type A and Type Z noninterviews can occur for a number of reasons. The two most common are refusals and inability to contact the household or arrange the interview. In 2003, refusals comprised almost half of all Type A noninterviews (48%), an increase from 37% of all Type A noninterviews in 1993 (Bates & Stoner, 2004).

30. Bates and Stoner's analysis, which concentrated on first time contacts at sample addresses, found that, for each of the surveys studied, the increase in Type A noninterviews resulted from increases in both refusals and non-contacts with households (Bates & Stoner, 2004). The refusal rate for NCVS TIS-1 households increased by about 144% between 1992 and 2003 (figure 6). The rate at which interviewers were not able to make contact at households increased by 100% between 1994 and 2003.

31. NCVS Type A and Type Z noninterview rates vary by household and person demographics (Blass, 2004; Peterson, 1999). In 2002, for example, black males had a 50% higher Type Z rate than black females and 30% higher rate than nonblack males (Blass, 2004)

² Noninterview rates were obtained from Census Bureau tabulations. For years prior to 1990, they represent the rates for TIS-2 through 7 households. Beginning in 1990 rates represent all rotation groups, TIS-1 through TIS-7.

2.3. Adjusting for noninterviews

32. The NCVS accounts for noninterviews by adjusting the weights used to produce national estimates of crime victimization. These weights are applied to each sample household and person and are summed to produce estimates of people and victimizations.

33. The initial weight assigned to each address in the sample is equal to its probability of selection. This initial or “base” weight is then adjusted to account for inequalities occurring during data collection (ICPSR, 2004). One of the inequalities is the impact of noninterviews. (Others inequalities, also adjusted for, include sub-sampling due to unexpected events in the field, such as new construction, area segments larger than anticipated, and other deviations from the overall stratum sampling rate.)

34. To adjust for nonresponse at the household level a household non-interview adjustment is created by increasing the weights of interviewed households most similar to households not interviewed in terms of race, MSA status and urban/suburban/rural status of residence. This adjustment increases the weight of the interviewed households to represent themselves as well as the non-interviewed households. The non-interviewed households are then assigned a weight of zero, thereby excluding them from population estimates.

35. To account for Type Z noninterviews; that is, non-interviewed persons in otherwise interviewed households, a within-household non-interview adjustment is used. Similar to the procedure for adjusting for household nonresponse, the weight for interviewed persons is increased to account for persons in the same demographic categories in terms of age, race, sex and household composition. The non-interviewed persons are then assigned a weight of zero, thereby excluding them from population estimates.

36. The underlying assumption in using these adjustments is that the interviewed persons and noninterviewed persons within each of the cells used in the adjustment experienced similar numbers and types of crime victimizations. This is why the adjustment is done by by assigning respondents and nonrespondents to cells using demographic variables believed to be associated with differing rates of victimization.

37. The historically low levels of nonresponse in the NCVS have given confidence that even if the underlying assumption are not wholly accurate and differences exist in the victimization experiences of respondents and non-respondents in any of the various cells used to adjust for nonresponse, the overall impact upon the rates would be too small to significantly bias victimization estimates.

38. It is true, however, that concerns about the impact of noninterviews on household surveys have been expressed since the survey’s early days, even when noninterview rates were very low. Love and Turner, in 1975, believed that there already growing problems in obtaining respondent cooperation in household surveys: “There is increasing concern among survey researchers, particularly in the private sector, over their ability to secure the cooperation of the citizenry in carrying out an ever-growing number of household surveys. The question arises as to what has been happening to response rates in social surveys over the past few years, and specifically whether the public is opting to refuse to participate in surveys more so now than in the past.” (Love and Turner, 1975)

39. These concerns have continued and grown as survey nonresponse rates have grown. A key question, and one still requiring study, is the extent to which the nonrespondents' experiences are similar to those of respondents. As long as nonrespondents resemble respondents in the key variables being measured, the survey results will have low degrees of bias. (Groves & Couper, 1998). Therefore, if the victimization experience of nonrespondents is similar to that of respondents, as is assumed by the noninterview adjustment process used in the NCVS, then the bias introduced to survey estimates will remain low even as nonresponse rates increase. If, however, nonrespondents have higher or lower victimization rates than respondents, the adjustments used to account for nonresponse would not eliminate the bias in the estimates.

40. The decade long decline in victimization rates in the U.S. has coincided with increasing nonresponse rates. Because the groups with the highest victimization rates also exhibit the highest nonresponse, there is concern that the declines in crime may have been enhanced by the increased nonresponse. Currently, BJS, the Census Bureau, and other Federal statistical agencies are participating in an interagency working group to study various aspects of survey nonresponse. BJS and the Census Bureau are also developing studies to explore the efficacy of the NCVS Type A and Type Z noninterview adjustments.

3. Summary

41. The National Crime Survey is celebrating its 34th full year of data collection. While the 1992 survey redesign altered some basic survey procedures, including the questions used to screen for the incidence of crime, the two aspects of the survey examined by this paper, telescoping and treatment of noninterviews have remained intact. That will change this year because of the elimination of the bounding interview.

42. Ultimately, a survey's methodology will be dictated by the resources available to address the questions the survey was designed to answer. For its entire history until the present day, the NCVS, (and its predecessor, the NCS) have employed an effective, if expensive method to address telescoping, one aspect of response bias. Because the bounding protocol is no longer an economically viable option, BJS and the Census Bureau are conducting research to determine how best to adjust future data collections to avoid creating a break in series with past estimates.

43. Increases in nonresponse over the past decade are indicative of the increasing difficulties in obtaining interviews for household surveys. There are no plans at present to alter the adjustments used to account for household and person noninterviews in the NCVS. Research is being developed to further examine noninterviews, but any results and the implementation of any changes to the weighting adjustment procedures are a long way away.

References

Bates, N. & Stoner, K. (2004). Noninterview Rates for Selected Major Demographic Household Surveys, 1990-2003. U.S. Census Bureau unpublished memorandum, Washington D.C.

Blass, B. (2004). Update to Person Nonresponse Trends for the National Crime Victimization Survey. U.S. Census Bureau unpublished memorandum, Washington D.C.

Bushery, J. M. (1978). "NCS Noninterview Rates by Time-in-Sample." U.S. Bureau of the Census unpublished memorandum, Washington, DC.

Cantor, D. & Lynch, J.P. (2000). "Self Report Surveys As Measures Of Crime And Criminal Victimization." In Duffee, D. (ed.) *Criminal Justice 2000: Measurement And Analysis Of Crime And Justice* (Vol. 4). U.S. Department of Justice: Washington, DC.

Groves, R.M. & Couper, M.P. (1998). *Nonresponse in Household Interview Surveys*. John Wiley & Sons. New York.

ICPSR (2004) *National Crime Victimization Survey, 1992-2003 Codebook*. University of Michigan, Inter-University Consortium for Political and Social Research. Ann Arbor, Michigan.

Lehnen, R.G. & Skogan, W.G. (1984). *The National Crime Survey: Working Papers Volume II: Methodological Studies* (NCJ-90307). U.S. Department of Justice: Washington, DC.

Love, L.T. & Turner, A.G. (1975) "Respondent Availability And Response Rates." Reprinted in Lehnen, R.G. & Skogan, W.G. (eds.) (1984) *The National Crime Survey: Working Papers Volume II: Methodological Studies* (NCJ-90307). U.S. Department of Justice: Washington, DC.

Murphy, L.R. & Cowan, C. (1976). "Effects Of Bounding On Telescoping In The National Crime Survey." Reprinted in Lehnen, R.G. & Skogan, W.G. (eds.) (1984) *The National Crime Survey: Working Papers Volume II: Methodological Studies* (NCJ-90307). U.S. Department of Justice: Washington, DC.

Peterson, A. (1999). Person Nonresponse Trends for the National Crime Victimization Survey. U.S. Census Bureau unpublished memorandum, Washington D.C.

Rosenthal, M.D. & Hubble, D.L. (1993). "Results From The National Crime Victimization Survey (Ncvs) CATI Experiment." Paper presented at the 1993 annual meetings of the American Statistical Association, San Francisco, Ca.

Skogan, W.G. (1981). *Issues In The Measurement Of Victimization* (NCJ-74682). U.S. Department of Justice: Washington, DC.

Winters, F. (1999). Effects Of Changing The Design Of The NCVS To Include The Bounding Interview In The Published Estimates. U.S. Bureau of the Census Memorandum. Washington, DC.

Woltman, H., Bushery, J. & Carstensen, L. Recall Bias And Telescoping In The National Crime Survey. Reprinted in Lehnen, R.G. & Skogan, W.G. (eds.) (1984) *The National Crime Survey: Working Papers Volume II: Methodological Studies* (NCJ-90307). U.S. Department of Justice: Washington, DC.

Figures

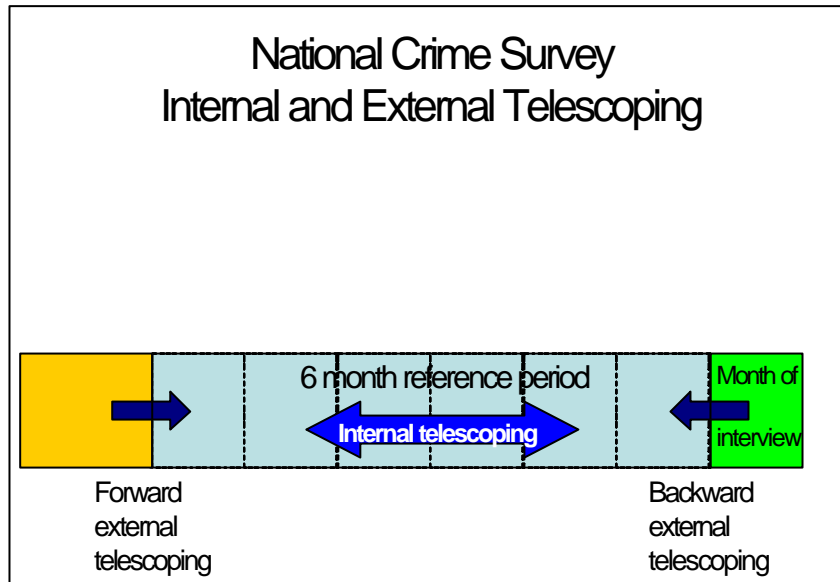


Figure 1.

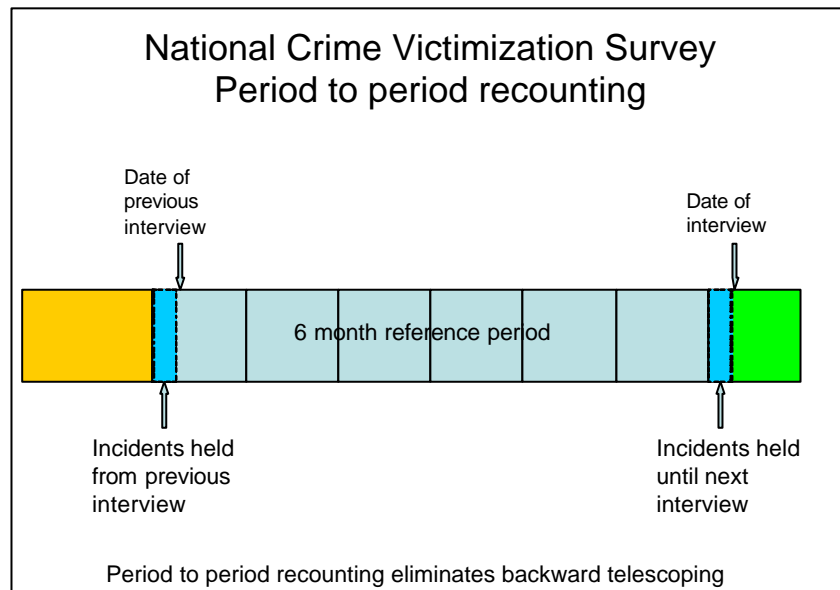


Figure 2.

**Reasons for Unbounded Interviews in the NCVS
 Time in sample 2-7 interviews, 1995-97**

Reason	Percent of interviews
Persons in replacement households	7.2%
Person was a noninterview (in an interviewed household) the previous enumeration	4.0
Persons in households that were noninterviews the previous enumeration	2.8
Persons added to the household this enumeration	1.8
Persons in units that are in sample for the first time	0.7
Total	16.6%

Figure 3.

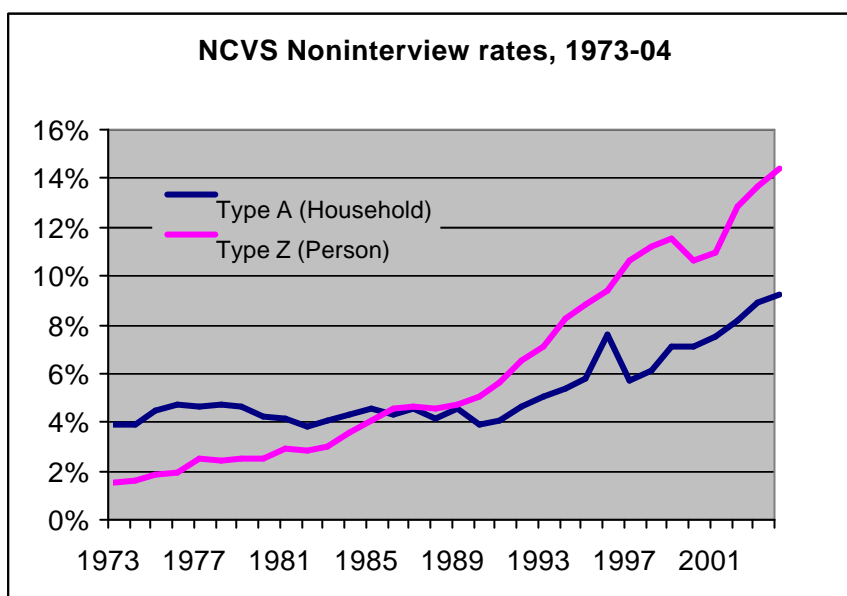


Figure 4.

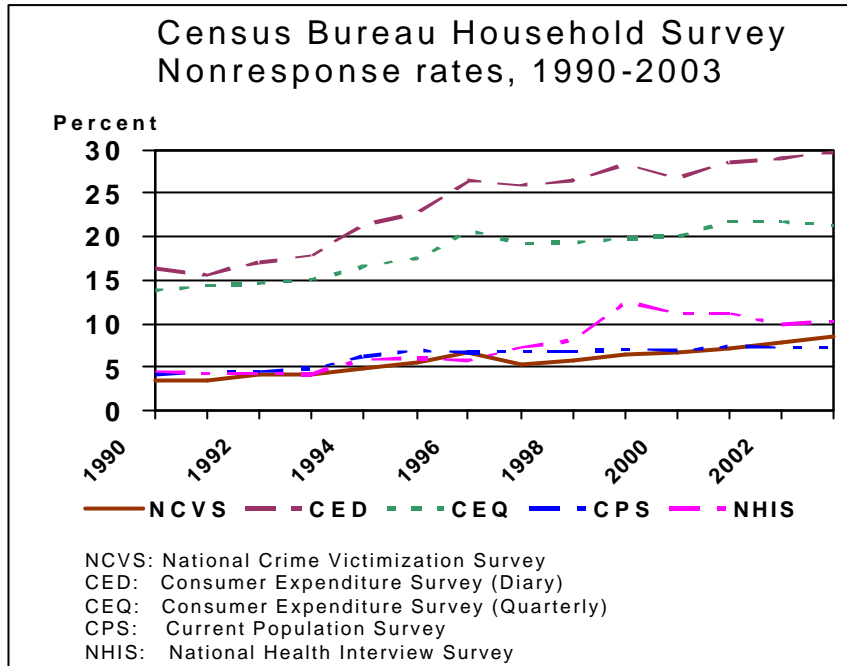


Figure 5

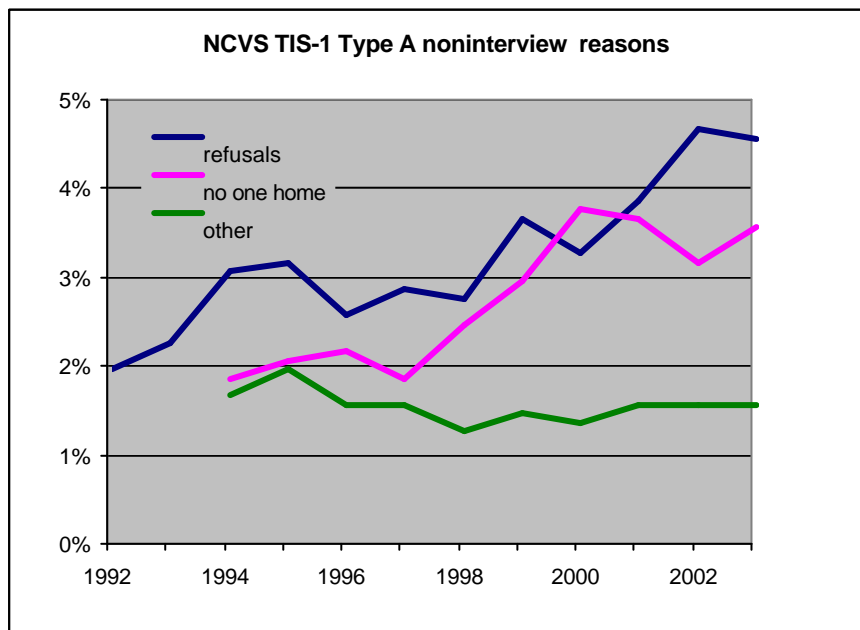


Figure 6
