

Quality and Measurement Error Assessment of Juvenile Interviews in the NCVS

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Abstract

This paper presents a quality assessment of a critical subpopulation within a national survey. The National Crime Victimization Survey (NCVS), sponsored by the Bureau of Justice Statistics, is a survey of U.S. households which measures non-fatal crime victimization counts and rates as well as characteristics of victimizations. The survey interviews all persons 12 years and older living in sampled households and uses the same survey instrument for all respondents. Juveniles (those 12 – 17 years old) have a high potential for various types of non-sampling error including nonresponse and measurement error. Sources of these non-sampling errors may include parental monitoring affecting the interview, cognitive ability to understand the instrument, and lack of availability to participate in the survey. Moreover, if participation rates are low among juveniles, the precision of the estimates may be inferior to adult estimates. This paper conducts a secondary analysis of the 2006 – 2012 NCVS to assess the quality of juvenile estimates and discusses the reasons for potentially lower quality estimates. Descriptive analyses of paradata and survey data are presented and discussed.

Key Words: Data Quality, Measurement Error, Nonresponse, Juveniles, NCVS

1. Introduction

Many large, national, federal surveys are interested in making inference about the target population as a whole and sub-domains within the target population (e.g., younger persons, minorities). Examples of these surveys include the National Crime Victimization Survey (NCVS; Truman and Langton, 2015) sponsored by the Bureau of Justice Statistics (BJS), the National Survey on Drug Use and Health (NSDUH; SAMHSA, 2014) sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA), and the Current Population Survey (CPS; Current Population Survey, 2000) sponsored by the Bureau of Labor Statistics.

Furthermore, in order to maintain consistency over time and across subpopulations, these large surveys use the same instrument for all respondents. As discussed in Smiley-McDonald, et al., (in press) the ability for large surveys to provide consistent quality across all subpopulations – especially among younger respondents – is difficult.

2. Motivation

2.1 Understanding the Problem

The National Crime Victimization Survey (NCVS) has been conducted since 1973 and is a nationally representative survey of U.S. households (approximately 40,000 households and 75,000 persons interviewed twice per year) that provides estimates of the frequency and characteristics of criminal victimization in the U.S. It is a panel survey sponsored by the Bureau of Justice Statistics, in which a household is included for up to seven years and interviewed every six months. The NCVS interviews all persons 12 years and older living in sampled households, and the same survey instrument is used for all respondents. Because of the lower participation of adolescents in surveys it is important to perform a quality assessment to ensure if the right age group is being included in the survey, or if adolescents should be included at all.

There are many reasons why adolescents may not participate in surveys in general or a survey about victimization in particular. Some of these reasons include;

- parental refusal,
- Consistently not at home, or
- Otherwise unavailable.

Furthermore, when juveniles do participate, there is the potential for their data to not be reliable. For example, younger respondents may be more likely to not conduct their interview in privacy which may impact how they respond to sensitive questions. Namely, concern about responses being overheard by parents could limit what an adolescent reveals during an in-person or telephone interview.

2.2 Goals

In this paper we present the results of a secondary data analysis of 12 – 17 year olds in the NCVS. The secondary data analysis consisted of a descriptive assessment of the quality of data from juveniles. As such, we developed the following research questions:

- How does the distribution of adolescents from the NCVS compare to other federal surveys?
- What are the participation characteristics of adolescents in the NCVS?
- What is the distribution of adolescent respondents by interview characteristic?
- Do victimization rates of adolescents by certain characteristics differ to other age groups?

This analysis allows for an initial assessment of the quality of the data provided by juveniles and whether data collected from this subpopulation is reliable and representative.

3. Methods

As discussed, the review of the quality of the estimates from juveniles in the NCVS consists of two parts: (1) review of paradata – auxiliary data about the survey or data related to the

survey process (Couper, 1998) and (2) comparison of key outcomes by interview characteristics. The analysis was based on data from the survey years 2007 – 2012.

3.1 Paradata

The NCVS collects a large amount of paradata on its respondents and, as a national survey, is comparable to other benchmark national surveys such as the American Community Survey (ACS). The ACS data used in the analysis consisted of the 5-year ACS data ending in 2012 and the 1-year estimates for 2008, 2010, and 2012. Our analysis of juveniles focused on the following types of paradata:

- Weighted distributions across demographic characteristics between the NCVS and ACS,
- Response rates,
- Mode of interview,
- Use of proxy,
- Presence of others during interview, and
- Timing data.

Our analysis compares descriptive statistics for each of these types of paradata. When sample allows, we split the juvenile population by age group and assess the data over time.

3.2 Outcomes

When assessing the quality of the survey responses, we assess whether different interview conditions alter the resulting victimization rates. As sample sizes allow, we consider the following victimization types for our analysis:

- Total violent crime: includes rape and sexual assault, robbery, aggravated assault, and simple assault.
- Family violence: includes any total violent crime committed by a person in the victim's family include boyfriends and girlfriends
- Rape and sexual assault
- Simple assault

We calculate descriptive statistics for each of these victimization types. We further assess how victimization rates change based on the interview characteristics.

4. Results

4.1 Paradata

The largest margins of disagreement between the NCVS and the ACS were found among the upper income categories and for the unknown income category. *Figure 1* shows the comparison of select demographic characteristics between the NCVS and ACS in 2012. For all years the NCVS had lower estimates for the \$50,000-\$74,999 and \$75,000 or more income categories but a substantially higher estimate for the unknown income category. The NCVS has a relatively high level of nonresponse for the household income – around 30% - question (Berzofsky, et. al., 2015). Therefore, the NCVS measure of income is problematic because of the high level of missingness. Given these explainable differences between the two sources of data, the demographic distributions between the ACS and the NCVS are determined to be fairly comparable.

An average of 11.5 thousand adolescent respondents per year were interviewed for the NCVS from 2007 through 2012, representing 7.9% of the total sample surveyed, as seen in *Figure 2*. During the study period, this percentage ranged from 7.6% in 2011 to 8.5% in 2007. According to the ACS, an average of 1.5 million adolescent respondents per year were interviewed from 2007 through 2012; they composed about 8.1% of the total sample surveyed. Thus, the NCVS and the ACS have similar proportions of juvenile respondents per year.

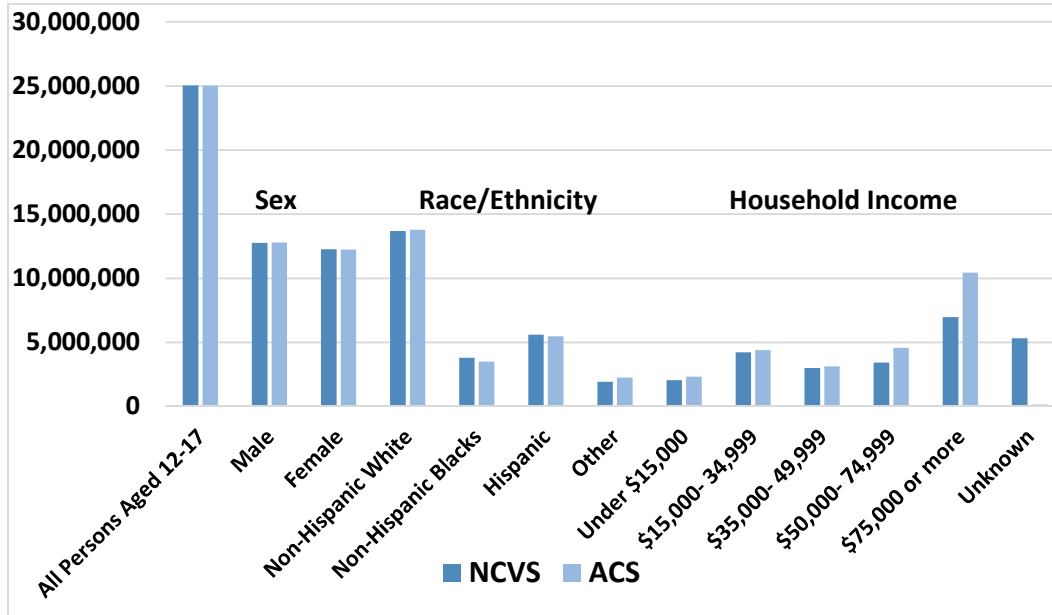


Figure 1: Comparison of the number of 12-17 year olds in the U.S. according to the ACS and NCVS by person and household characteristics, 2012

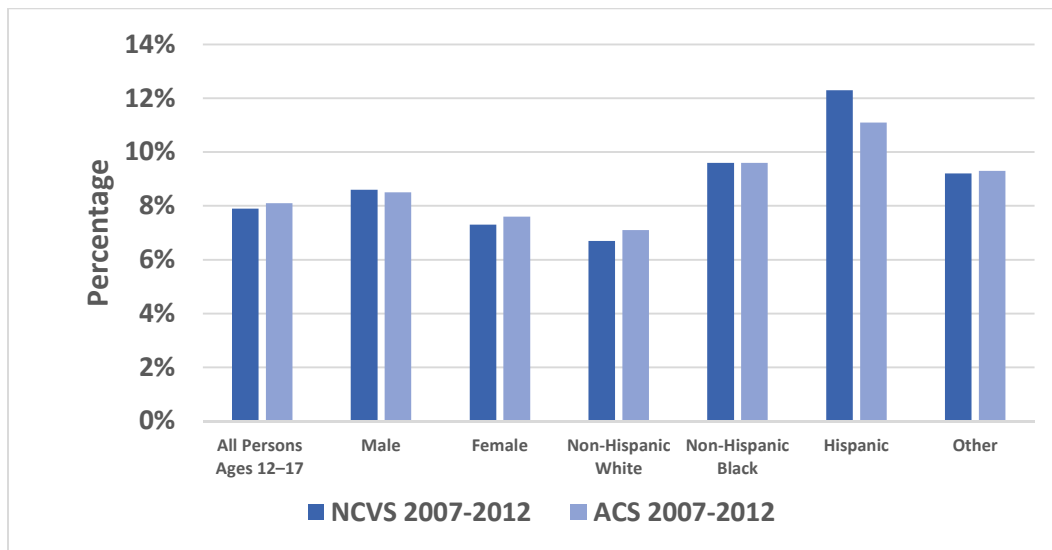


Figure 2: Adolescents as a percentage of the total sample in the U.S. according to NCVS and ACS, by demographic characteristics, 2007-2012

The overall response rate among adolescents was compared with the overall response rate among adults aged 18 or older. As shown in *Figure 3*, excluding proxy interviews across all age groups, respondents aged 18 years or older had a much higher response rate than those ages 12 or 13 and those ages 14–17. This finding was true as well when adults were restricted to those 18–25 years old – the age category closest to 12–17 year olds.

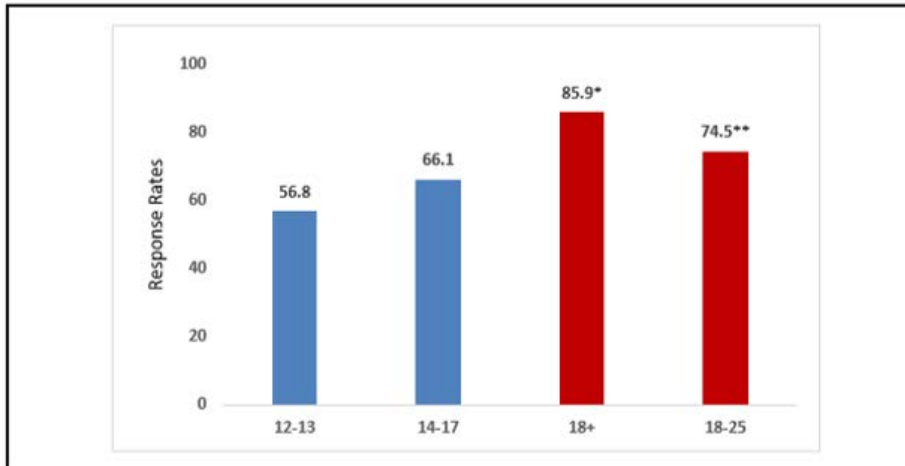


Figure 3: Average annual response rates of non-proxy NCVS respondents by age group, 2007-2012

The adolescent response rates from 2007 through 2012 were examined by demographic characteristics. There was little variability observed in the response rates by sex and race/ethnicity. *Table 1* shows that across all years, the response rates by sex were close to the overall response rate of 71.6%, as were the response rates among race/ethnicity levels, with the exception of the Hispanic race/ethnicity level. These rates were also examined over time, and the percentage breakdowns by sex and race/ethnicity were stable as were the corresponding response rates.

Table 1: Average annual number of respondents and response rates of adolescents by demographic characteristics, 2007-2012

| Demographic characteristics | Number of respondents | Response rate (%) |
|-----------------------------|-----------------------|-------------------|
| All persons ages 12–17 | 11,498 | 71.6 |
| Sex | | |
| Male | 5,884 | 71.5 |
| Female | 5,614 | 71.6 |
| Race/ethnicity | | |
| Non-Hispanic White | 6,858 | 70.6 |
| Non-Hispanic Black | 1,439 | 68.9 |
| Hispanic | 2,405 | 76.8 |
| Other | 795 | 70.4 |

As seen in this **Table 2** there is some variation in adolescent response rates by selected household characteristics. In particular, adolescents in households with incomes under \$50K had response rates closer to 80%. The lowest response rate by household characteristic was reported among adolescent respondents from households with unknown annual incomes. By number of persons in the household, the response rate among adolescents in two-person households was relatively high, with an average response rate of 77.7%. When the trends in response rates by income and persons in household were examined by year, the trends were relatively stable across most of the variables examined.

Table 2: Average annual number, percentage, and response rate of adolescents by household characteristics, 2007-2012

| Household Characteristics | Number of Respondents | Response Rate (%) |
|---------------------------------------|-----------------------|-------------------|
| All Persons Aged 12-17 | 11,498 | 71.6 |
| Household Income | | |
| Under \$15,000 | 762 | 77.9 |
| \$15,000- 34,999 | 1,783 | 79.7 |
| \$35,000- 49,999 | 1,381 | 78.1 |
| \$50,000- 74,999 | 1,629 | 75.8 |
| \$75,000 or more | 3,206 | 74.4 |
| Unknown | 2,737 | 59.2 |
| Number of Persons in Household | | |
| 2 | 740 | 77.7 |
| 3 | 2,416 | 73.3 |
| 4 | 3,912 | 71.6 |
| 5 or More | 4,426 | 69.6 |

While the response rates among 12 – 17 year olds are consistent across subpopulations it was of interest to see if the rates varied across ages within 12 – 17 year olds. The average annual response rate by adolescent age group was relatively stable over time (*Figure 4*). Young respondents aged 12 and 13 consistently had slightly higher than average response rates over time. For example, among 12-year old respondents, the response rate ranged from 73.7% in 2007 to 77.7% in 2010. At the other end of the age spectrum, among 17-year old respondents, the response rates during this period ranged from 66.9% in 2009 to 70.9% in 2010. However, this lower response rate for those 14-17 isn't surprising since adolescents of that age tend to be away from the home more than 12-13 year olds.

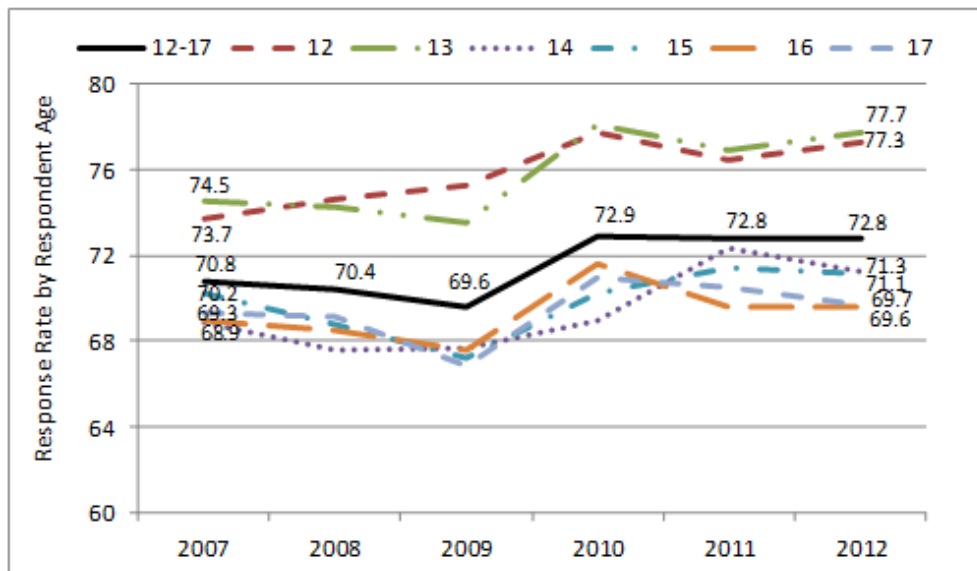


Figure 4: Average response rates among adolescents by age and survey year, 2007-2012

In terms of the characteristics of the interview, trends were broken down within adolescent age groups and compared to the overall average of adolescents and adults aged 18-25. As shown in **Table 3**, the majority of proxy interview among adolescents are comprised of the 12-13 year age group, making up 73% of adolescent proxy interviews. There are also more proxy interviews completed among adolescents than adults aged 18-25 (11.6% proxy interviews for 12 – 17 year olds compared to 4.2% among 18 – 25 year olds). Among adolescent respondents, it was common to have another person with them during their interview for each of the years studied (only collected on in-person interviews). The trends of presence of others was consistent across adolescent age groups. Also, the rate for having another household member present is significantly higher than the rate found among young adults aged 18-25 during this period.

Table 3: Average percentage of adolescents by proxy status, person present and age group, 2007-2012

| | 12-13 year old Percentage (%) | 14-15 year old Percentage (%) | 16-17 year old Percentage (%) | 12-17 year old Percentage (%) | 18-25 year old Percentage (%) |
|--|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Proxy interview | | | | | |
| Yes | 8.5 | 1.5 | 1.6 | 11.6 | 4.2 |
| No | 25.8 | 30.6 | 32.0 | 88.4 | 95.8 |
| Presence of others during interview | | | | | |
| Another household member under age 12 | 4.7 | 4.0 | 3.0 | 11.7 | 5.7 |
| Another household member over age 12 | 20.6 | 22.3 | 21.0 | 63.9 | 47.7 |
| No one else present | 8.0 | 6.7 | 8.0 | 22.7 | 46.6 |

The majority of NCVS interviews are conducted via telephone over the course of the interview period regardless of the age of the respondent. On average between 2007 and 2012, 57.5% of adolescent respondents participated in telephone interviews and 42.5% participated via in-person interviews. As seen in *Figure 5*, among adolescent respondents, the highest percentage of telephone interviews was recorded in 2007 and the lowest in 2011. Across most of the demographic and household characteristics that were also examined, there were downward trends in telephone interviews and thus, concurrent upward trends in in-person interviews between 2007 and 2012. Adults responded by in-person at the same rate as adolescents as a whole (41.7%) during the same period and follow the same trend of increasing in-person interviews and decreasing telephone interviews. However we also found, on average, 12 – 13 year olds required an in-person interview at a significantly higher rate (43.4%) than adults during the six year period.

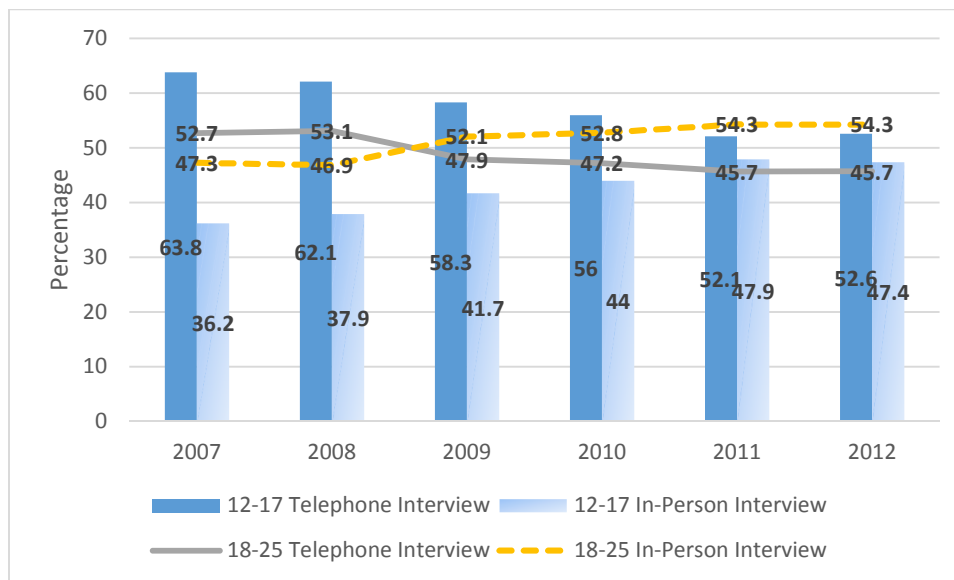


Figure 5: Average annual percentage of adolescents by mode of interview and survey year, 2007-2012

Timing data was also examined between adolescents and adults. As seen in *Table 4*, adolescents take significantly less time on the screener and on the total survey. For this analysis, the screener time and total time were divided into quartiles based on the time it took 12 – 17 year olds to complete the screener and total survey, respectively¹ (i.e., the approximate number of 12 – 17 year olds in each category is approximately 25%). Based on the quartile definitions the distributions of adults were computed. For almost all quartiles, for both the screener time and the total time, adults took a significantly longer time than juveniles. It should be noted that one possible reason that adults take longer is that one adult in each household, as the reference person for the household, answers additional questions about property crime that juveniles are not asked.

¹ If no crime victimizations are indicated then the screener time is the total time for the interview.

Table 4: Average percentage of all respondents by timing characteristic and age category, 2007-2012

| Characteristic | 12-17 | 18 or Older |
|---|-------------------------|-------------|
| | Percentage ^a | Percentage |
| Screen Time in Seconds^b | | |
| 0-14 | 25.8% | 14.5%* |
| 15-57 | 24.3 | 22.1* |
| 58-131 | 25.1 | 25.6 |
| >131 | 24.8 | 37.7* |
| Total Time in Seconds^b | | |
| 0-14 | 25.7% | 14.5* |
| 15-58 | 24.3 | 22.3* |
| 59-136 | 25.0 | 25.8 |
| >136 | 25.0 | 37.4* |

a. Comparison group.

b. Categories based on quartile distribution of 12-17 year olds.

*Comparison statistically different at the 95% confidence level.

4.2 Outcomes

In general, juveniles have higher rates of victimization compared to adults. *Table 5* presents the average victimization rates and corresponding standard errors for the years 2007 – 2012 for key victimization types among 12 – 17 year olds, 18 – 25 year olds, and all adults 18 years old or older. From 2007 through 2012, juvenile respondents experienced 45.7 violent victimizations per 1,000 persons, a rate greater than those of respondents aged 18 or older (18.0 violent victimizations per 1,000 persons) and young adults ages 18–25 (41.4 violent victimizations per 1,000 persons). During the same period, juvenile NCVS respondents also had higher rates of simple assaults (32.5 simple assaults per 1,000 persons ages 12–17) than adult respondents aged 18 or older (12.4 simple assaults per 1,000 persons aged 18 or older) and young adults ages 18–25 (25.5 simple assaults per 1,000 persons ages 18–25). The relative standard errors of 12-17 year olds are very similar to 18-25 year olds across most victimization types. The biggest exception is family violence where 12 – 17 year olds have a relative standard error (RSE) of 22% compared to 9% for 18 – 25 year olds.

Table 5: Rate and standard error of violent victimizations among adolescent respondents, by type of victimization and year, 2007-2012.

| Victimization type | Respondents ages 12–17 | | Respondents ages 18 or older | | Respondents ages 18–25 | |
|---|------------------------|-----|------------------------------|-----|------------------------|-----|
| | Rate | SE | Rate | SE | Rate | SE |
| Violent victimizations | 45.7 | 2.4 | 18.0 | 0.6 | 41.4 | 2.2 |
| Simple assaults | 32.5 | 1.8 | 12.4 | 0.5 | 25.5 | 1.8 |
| Family violence victimizations | 4.5 | 1.0 | 4.6 | 0.2 | 9.7 | 0.9 |
| Rape and sexual assault victimizations | 1.8 | 0.4 | 0.8 | 0.1 | 2.7 | 0.6 |

Ideally, the interview mode will not be related to the likelihood of participants disclosing victimization. Of particular interest is whether juveniles were more or less likely to report being the victim of crime if they were interviewed in person or over the telephone or in the presence of others. **Table 6** presents the average number and rate of victimizations by interview mode, presence of others and victimization type. Adolescents with someone else present during the in-person interview reported lower rates of violent victimizations and simple assault victimizations than did their counterparts with no one else present.

Furthermore, during the study period, on average, adolescents participating in telephone interviews reported lower rates of violent victimizations and simple assault victimizations than did those interviewed in person. It should be noted that Couzens, Krebs, & Berzofsky (2015) found that rate differences in mode are correlated to interview number which may explain much of the differences found here. In other words, because of the NCVS's dual mode design which has initial interviews conducted in person and later interviews conducted by telephone and the fact that initial interviews tend to have more reported crime victimizations, the correlation between mode and victimization rates may be spurious.

Table 6: Average annual number and rate of victimizations among 12 to 17 year olds, by interview mode, presence of others, and by type of victimization, 2007-2012

| Person/household characteristics | Violent victimizations | | Family victimizations | | Rape or sexual assault victimizations | | Simple assault victimizations | |
|--|------------------------|--------------------------|-----------------------|-------------------------|---------------------------------------|------------------------|-------------------------------|--------------------------|
| | No. | Rate | No. | Rate | No. | Rate | No. | Rate |
| All persons ages 12-17 | 1,134,447 | 45.7 | 110,773 | 4.5 | 45,725 | 1.8 | 806,158 | 32.5 |
| Interview mode | | | | | | | | |
| In person[*] | 551,378 | 52.3 | 50,810 | 4.8^a | 22,239 | 2.1 | 384,564 | 36.5 |
| By telephone | 583,069 | 40.8^{**} | 59,963 | 4.2 | 23,486 | 1.6^a | 421,594 | 29.5^{**} |
| Presence of others during interview | | | | | | | | |
| Yes[*] | 975,383 | 43.4 | 83,810 | 3.7 | 43,836 | 2.0 | 690,501 | 30.7 |
| No | 159,064 | 67.6^{**} | 26,964 | 11.5^a | 1,888 | 0.8^a | 115,658 | 49.2^{**} |

*Comparison group.

**Comparison statistically different at the 95% confidence level.

^a Interpret with caution; estimate based on coefficient of variation greater than 30%.

Figure 6 shows the variability in victimization rates by presenting the rates of specific types of victimizations experienced by adolescents from 2007 to 2012. However, these rates across time are not statistically different from one another because of the lack of precision in the annual estimates. The rates for both violent and simple assault victimizations peaked in 2007 (61.8 and 44.2 victimizations per 1,000 persons, respectively), decreased from 2008 through 2010, and then rose to their 2012 levels of 48.4 and 38.5 victimizations per 1,000 persons, respectively. The rates for rape and sexual assault and for family violence victimizations were relatively flat during this study period, however those rates must be interpreted with caution because they are based on small cell sizes.

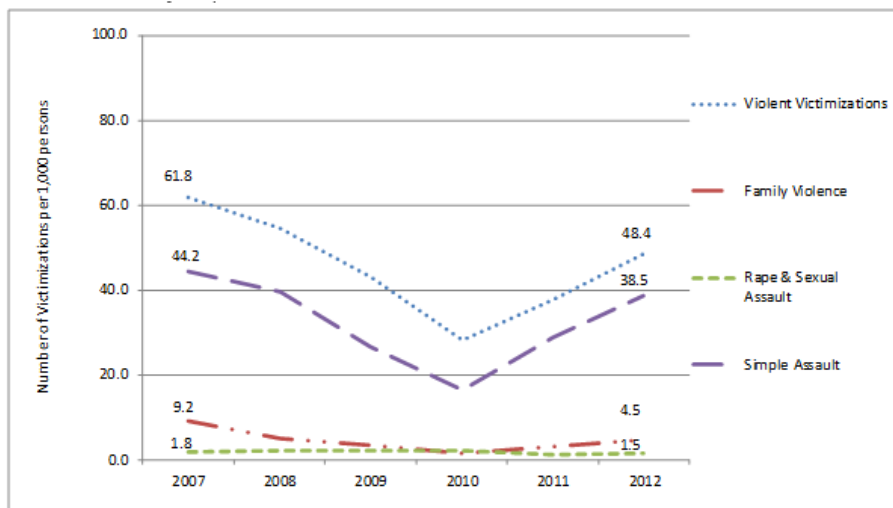


Figure 6: Rate of violent victimizations among adolescent respondents by type of victimization and year, 2007-2012

5. Conclusions

5.1 Quality

After completing the secondary data analysis we found that for adolescent demographic characteristics, the NCVS compares favorably to the ACS, which speaks to the integrity of the sampling design. The average annual response rate by adolescent age group was relatively stable over time—ranging from 69.6% in 2009 to 72.9% in 2010—but we see that juveniles are participating in the NCVS at lower rates compared to adults. Interestingly, young respondents aged 12 and 13 had slightly higher than average response rates compared to older adolescents aged 14-17, which may be due to older juveniles being more active outside of the home. Over 70% of the in-person interviews in 2007-2012 had someone else in the room when they participated. When other persons were present during the interview significantly lower rates of victimization were reported among adolescents. These findings suggest that privacy matters with respect to juveniles reporting victimization.

In general, among the paradata measures, our analysis found stability among 12 – 17 year olds. However, the rates across each paradata measure – response rates, use of proxies, other persons present – were worse (e.g., lower response rates, higher user of proxies and having other persons present) among juveniles.

5.2 Next Steps

Our analysis was an initial step to understand the quality of data received from juveniles in the NCVS. To fully understand the quality of the juvenile data more complex analyses controlling for various interview and respondent characteristics should be conducted.

Acknowledgements

The authors would like to thank BJS for sponsoring this research and comments provided by Mike Planty and Lynn Langton. However, we would like to note that the views expressed in this paper are those of the authors only and do not reflect the views or position of BJS or the Department of Justice.

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