

## Questionnaire Design Considerations When Expanding a Survey Target Population to Include Children

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### Abstract

When designing a questionnaire, survey practitioners are challenged with developing questions that are appropriate for all respondents within the target population. This task becomes increasingly difficult when the same survey instrument will be administered to both children and adults.

This paper examines factors to be considered when asking children to respond to the same survey items as adults. The authors present a review of the literature, citing cognitive difficulties that younger respondents encounter when reporting past behaviors, particularly sensitive behaviors. In these situations, questions may have to be reworded or limited to key questions to allow younger respondents to comprehend questions within a given questionnaire and time length. Survey designers can also expect younger respondents to have greater difficulty recalling past behaviors, especially within specific time periods. This research suggests that the validity of young children's self-reports may only be acceptable when using an age-appropriate instrument and measuring non-sensitive behaviors.

In order to evaluate the impact on questionnaire design and nonresponse of expanding a target population to include children under 12 years of age, the authors examined data from the National Survey on Drug Use and Health (NSDUH). The NSDUH, sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA), is an annual face-to-face, household survey involving interviews with approximately 70,000 randomly selected individuals 12 years old and older. NSDUH is the nation's leading source of information on substance use behaviors. We examined differences in cognitive ability, nonresponse, and timing data between minors in the NSDUH sample. The differences in respondent behavior between the 12 to 17 year old age group provided insight into the effects of administering a survey to respondents under 12 years of age. Based on this research and literature reviews, this paper provides issues for consideration and suggestions to questionnaire designers who are either developing new questionnaires for younger populations or amending existing instruments to be administered to younger respondents.

Key Words: Questionnaire Design, Minor Respondents, Cognitive Sophistication

### 1. Introduction

In order to collect valid survey data and maintain that validity over time, survey practitioners should evaluate the design of cross-sectional surveys on a regular basis. Potential sample members' eligibility requirements are a critical element of design features that can affect relevance and utility of survey data. In cases where prevalent behavior occurs within a population that is outside the survey universe, population estimates will suffer from undercoverage.

Using the National Study on Drug Use and Health (NSDUH) as a model, this paper presents survey design considerations that practitioners should evaluate when determining the feasibility of expanding a survey universe to include children younger than 12 years old.

The NSDUH provides national and state-level data on the use of tobacco, alcohol, illicit drugs (including non-medical use of prescription drugs) and mental health in the United States. NSDUH is sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA), an agency of the U.S. Public Health Service in the U.S. Department of Health and Human Services (DHHS). The NSDUH currently samples a non-institutionalized population age 12 and older.

There are a number of reasons that a survey may wish to sample children under the age of 12, as well as older adolescents and adults. There are two compelling reasons to consider including children under 12 in the NSDUH—(1) some children under 12 do use drugs and (2) the estimates of undercoverage in past year initiation show<sup>1</sup>:

“The overall adjusted estimate for past year initiates of alcohol use by persons 11 years of age or younger on the date of the interview was 279,949, or about 6.1 percent of the estimate based on past year initiation by persons 12 or older only. Based on similar analyses, the estimated undercoverage of past year initiates was 5.6 percent for cigarettes, 1.1 percent for marijuana, and 22.7 percent for inhalants.

The undercoverage of past year initiates aged 11 or younger also affects the mean age at first use estimate. An adjusted estimate of the mean age at first use was calculated using a weighted estimate of the mean age at first use based on the current survey and the numbers of persons aged 11 or younger in the past year obtained in the aforementioned analysis for estimating undercoverage of past year initiates. Analysis results showed that the mean age at first use was changed from 16.8 to 16.3 (or a decrease of 2.8 percent) for alcohol, from 16.9 to 16.4 (or a decrease of 3.1 percent) for cigarettes, from 17.6 to 17.5 (or a decrease of 0.6 percent) for marijuana, and from 17.1 to 15.6 (or a decrease of 8.9 percent) for inhalants.”

Based on literature reviews and NSDUH experience, this paper describes major issues for examination when considering collecting data from or regarding children under 12. In Section 2, we present these considerations, including issues related to nonresponse, questionnaire issues, and data quality. Section 3 summarizes the main challenges introduced when expanding a survey target population to include children under 12 years of age.

## **2. Considerations for Expanding Coverage**

This section includes key items for consideration when evaluating whether or not to expand coverage to include children under 12 years of age in a survey.

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<sup>1</sup> Substance Abuse and Mental Health Services Administration. (2008). *Results from the 2007 National Survey on Drug Use and Health: National Findings* (Office of Applied Studies, NSDUH Series H-34, DHHS Publication No. SMA 08-4343). Rockville, MD.

## 2.1 Nonresponse

Under the current NSDUH design, younger persons tend to have higher response rates than older sample members. However, parents often refuse for their children, especially when parents refuse the survey themselves. Parents might have stronger objections if asking permission to interview children under 12 in the household. An analysis of NSDUH parental refusal rates of youth interview respondents (respondents aged 12-17) was completed to test the hypothesis that parental refusal rates are higher among younger respondents.

**Table 1** displays parental refusal rates from NSDUH survey years 2005-2008 among respondents aged 12 to 17. The percentages represent the weighted proportion of incomplete interviews due to parental refusals among all eligible selected interviews in a single year of age. As evidenced by the data in the table, the parental refusal rate in each individual age category has increased over time. Additionally, parental refusal rates on behalf of younger adolescents have been consistently higher than for older adolescents. When combining data from all four years, as displayed in the **Total (All Years)** column, it is evident that overall, the parental refusal rate increases as the age of youth respondents decreases. Based on these findings, it is reasonable to assume that the parental refusal rate for individuals under 12 years of age would be higher than for individuals 12-17 years old.

**Table 1: NSDUH Weighted Single Year Parental Refusal Rates Among Persons Aged 12 to 17, 2005 - 2008**

Respondent Age (in Years)	Parental Refusal Rate									
	2005		2006		2007		2008		Total (All Years)	
	Count of Parental Refusals	Weighted %	Count of Parental Refusals	Weighted %	Count of Parental Refusals	Weighted %	Count of Parental Refusals	Weighted %	Count of Parental Refusals	Weighted %
Total (All Ages)*	1,737	6.80%	2,041	8.10%	1,985	8.06%	2,192	8.71%	7,955	7.91%
12	321	7.58%	380	9.58%	370	9.35%	377	9.46%	1,448	8.99%
13	325	7.63%	354	7.83%	349	8.76%	422	10.64%	1,450	8.69%
14	289	6.43%	349	8.66%	361	8.45%	378	8.45%	1,377	7.99%
15	290	6.81%	361	8.24%	313	7.80%	347	8.92%	1,311	7.94%
16	261	6.27%	305	7.18%	301	7.04%	338	7.64%	1,205	7.03%
17	242	5.85%	279	6.90%	284	7.03%	317	7.05%	1,122	6.71%

\*Total (All Ages) includes respondents who were unspecified 12-17 years of age.

To determine whether there were significant differences in parental refusal rates among different ages within a survey year, an overall Wald F-test was performed for each survey year. Results from the overall Wald tests show statistically significant values, which indicate there are notable differences among the single year ages within the 12 to 17 age group. To test for statistically significant differences among the parental refusal rates of each individual age category, pairwise comparisons were run between single year of age within each survey year. The findings of these tests, reported in **Table 2**, indicate that younger adolescents, 12 and 13 year olds, have significantly higher parental refusal rates than older adolescents, 16 and 17 year olds. Based on these results, the inference can be made again that respondents under age 12 are somewhat likely to have higher parental refusal rates than respondents age 12 to 17 years old.

**Table 2: NSDUH Parental Refusal Trend Tests Among Aged 12 to 17 Within 2005 - 2008**

Tests	Parental Refusal Rate							
	2005		2006		2007		2008	
	Test Statistic	P-Value	Test Statistic	P-Value	Test Statistic	P-Value	Test Statistic	P-Value
<b>Overall</b>	2.76	0.01**	3.96	0.00**	3.20	0.00**	5.39	0.00**
<b>Pairwise Comparison</b>								
12 vs. 13	-0.07	0.94	2.34	0.02*	0.70	0.48	-1.38	0.17
12 vs. 14	1.78	0.08	1.19	0.23	1.14	0.25	1.30	0.20
12 vs. 15	1.20	0.23	1.69	0.09	1.96	0.05*	0.59	0.55
12 vs. 16	1.89	0.06	3.21	0.00**	2.96	0.00**	2.50	0.01**
12 vs. 17	2.59	0.01**	3.60	0.00**	3.10	0.00**	3.27	0.00**
13 vs. 14	1.75	0.08	-1.21	0.23	0.39	0.69	2.58	0.01**
13 vs. 15	1.23	0.22	-0.58	0.56	1.20	0.23	1.87	0.06
13 vs. 16	2.08	0.04*	0.94	0.35	2.52	0.01**	3.77	0.00**
13 vs. 17	2.78	0.01**	1.38	0.17	2.22	0.03*	4.40	0.00**
14 vs. 15	-0.59	0.55	0.56	0.58	0.84	0.40	-0.55	0.58
14 vs. 16	0.25	0.80	2.17	0.03*	2.03	0.04*	1.17	0.24
14 vs. 17	0.95	0.34	2.58	0.01**	1.98	0.05*	1.99	0.05*
15 vs. 16	0.88	0.38	1.43	0.15	1.04	0.30	1.55	0.12
15 vs. 17	1.59	0.11	2.02	0.04*	1.07	0.28	2.21	0.03*
16 vs. 17	0.69	0.49	0.43	0.67	0.01	0.99	0.85	0.39

\* significant at the .05 level

\*\* significant at the .01 level

The increase in parental refusal rates among younger ages is counteracted somewhat by a slight increased willingness for younger persons to agree to participate (if parents allow it). While the refusal rates among 12-year olds are historically around 1-2%, the same rates for 17-year olds are approximately 3-4%. The overall NSDUH refusal rates presented in **Table 3** are the sums of both the respondent refusal and parental refusal rates and indicate a virtual “cancelling out” effect of increased parental refusals versus the decreased refusal rate among younger age groups.

**Table 3: NSDUH Weighted Interview Result Counts and Frequencies Among Persons Aged 12 to 17, 2005-2008**

Year	Interview Result Codes	Respondent Age (in Years)					
		12	13	14	15	16	17
		%	%	%	%	%	%
2005	70 - Interview Complete	87.45	87.29	88.90	86.71	87.25	85.21
	Overall Refusal	9.19	9.96	8.58	9.78	9.29	10.25
	77 - Refusal	1.61	2.33	2.15	2.97	3.02	4.39
	78 - Parental Refusal	7.58	7.63	6.43	6.81	6.27	5.85
	Other Nonresponse	3.35	2.76	2.52	3.51	3.46	4.55
2006	70 - Interview Complete	84.66	86.42	85.74	85.19	86.00	85.22
	Overall Refusal	11.49	10.20	10.82	11.36	10.21	10.47
	77 - Refusal	1.92	2.37	2.16	3.12	3.02	3.57
	78 - Parental Refusal	9.58	7.83	8.66	8.24	7.18	6.90
	Other Nonresponse	3.85	3.38	3.45	3.45	3.79	4.31
2007	70 - Interview Complete	84.56	85.16	85.93	86.20	85.46	84.83
	Overall Refusal	11.63	11.05	10.58	10.48	10.36	10.54
	77 - Refusal	2.29	2.30	2.13	2.68	3.33	3.52
	78 - Parental Refusal	9.35	8.76	8.45	7.80	7.04	7.03
	Other Nonresponse	3.80	3.78	3.48	3.32	4.17	4.63
2008	70 - Interview Complete	84.32	83.63	86.03	85.15	85.55	83.99
	Overall Refusal	11.11	13.17	10.45	11.45	11.16	11.21
	77 - Refusal	1.65	2.53	1.99	2.54	3.53	4.16
	78 - Parental Refusal	9.46	10.64	8.45	8.92	7.64	7.05
	Other Nonresponse	4.02	2.63	2.86	3.03	2.61	3.95

To further examine the distribution of final interview results for younger persons aged 12 to 17, we analyzed the completion and refusal rates along with interview outcomes of the parental figures living in the same household. Without the availability of complete household relationship information at the person-selection stage of data collection, certain assumptions had to be made in this analysis. The subset of the entire selected sample of youths 12 to 17 used in this analysis consists of those youths from households where 2 persons were selected to complete the interview and their "relationship to screener" information indicated they were either (1) a son or daughter (including step) or son-in-law/daughter-in-law of the householder or the householder's spouse who was also selected, or (2) a sibling of the screening respondent whose parent or guardian was also selected to complete the NSDUH interview.

Among adolescents whose parent completed the interview, the majority also successfully completed the survey (approximately 97%). Among adolescents whose parent refused to complete the interview, more than half of the minors were not given the opportunity to complete the interview due to parental refusal (57.58% in 2007 and 60.75% in 2008). The unweighted interview response rates among the adolescents whose parent refused themselves to complete the interview were similar across both the younger (12-14) and older (15-17) adolescent age groups, around 24-25%. These results coincide with the results in **Table 3** which show that younger adolescents are less likely than older adolescents to refuse once given the opportunity to participate, but their parents are more likely to refuse to allow them to participate. It is difficult to assess how this phenomenon would impact individuals under 12 years of age. Based on the NSDUH data, we do not believe the refusal rate would drop much below what it is for 12-14 year olds. Therefore, we suspect either the “cancelling out” phenomenon would occur for individuals under 12 years of age or increased parental refusal rates for respondents under 12 years of age would have a negative impact on the response rate for these individuals.

## 2.2 Institutional Review Board Concerns

In determining whether children are capable of assenting, an Institutional Review Board (IRB) must take into account the ages, maturity, and psychological state of the children involved. Based on discussions with a representative of RTI International’s IRB, if expanding the NSDUH survey target population to include children under 12 years of age, the following aspects of survey design would need to be evaluated in order to ensure the rights of respondents of all ages are respected. These issues are not all expected to be significant, nor are they exhaustive, but they should be taken into consideration

- Because of the lower cognitive ability of younger children, confidentiality issues and the voluntary nature of the child’s participation would need to be emphasized.
- If a parent were to complete the interview before the child, the parent would have a clear sense of the kinds of questions being asked. This may lead some parents to ask their children how they answered these questions. Emphasis on the confidentiality of the data provided by children under 12 might help to address this concern.
- Providing non-cash incentives, which may be more valuable to younger children, could address concerns about parents appropriating cash incentives paid to their children.
- Adults may be hesitant to leave younger children with adult strangers. For this reason, it might be preferable to have female interviewers for interviewing younger children.<sup>2</sup>

In considering the protection of human subjects, project teams would need to provide some evidence showing that there are not negative outcomes from asking sensitive questions of younger children. This point is also related to cognitive ability, because a lack of question comprehension may trigger unique thoughts among younger children,

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<sup>2</sup> This might lead to lower response overall among this age group because of the unavailability of a female interviewer in the area within the data collection period.

such as making them feel they should engage in the behaviors mentioned in the survey items.

Existing literature suggests that instruments such as the NSDUH questionnaire would need to be modified to adequately address IRB concerns with interviewing young children. Knight et al. (2000) summarized the methodological and ethical challenges associated with child self-report of maltreatment. In this article, the authors considered age 12 an appropriate age for asking children about perceptions of experienced abuse and neglect by citing Ceci and Bruck's (1993) study which showed that younger children are more vulnerable to potentially suggestive influences in an interview than older children, adolescents, or adults. The authors were concerned that children younger than 12 who had not been abused might be traumatized or confused by direct questions on abusive behaviors. To reduce participant burden related to unnecessary exposure to sensitive questions, they constructed the interview to contain a limited number of key questions and the most salient follow-up items. These findings would need to be explored in the context of other sensitive topics, such as by conducting cognitive interviews with children under the age of 12. This might lead to different wording of questions or the omission of some questions that are included in the adolescent questionnaire.

### **2.3 Data Quality**

As suggested in Section 2.2, there might be greater pressure by parents of children under 12 years of age to reveal survey responses. Even if the pressure is not greater than for older adolescents, there might be a perceived pressure by younger children, especially if they do not fully comprehend confidentiality procedures. Because of this, children under 12 years of age might be less likely to acknowledge use and report sensitive behaviors. In addition, younger children might not have the cognitive capacity to accurately recall past use. This leads to a concern that the validity of self-reported sensitive behaviors may be lower for children under 12 years of age than for older children. The research below suggests that the validity of young children's self-reports may only be acceptable when using an age-appropriate instrument and measuring non-sensitive behaviors.

- Hamby and Finkelhor (2000) recommended collecting self-report data with children as young as age seven, based on previous research that showed internal consistency, test-retest reliability, and construct validity comparable with those obtained from older children for studying victimization of children. However, Varni et al. (2007, 1) argued that self-reports of young children were valid only when using an age-appropriate instrument. Schwabstone et al. (1994) also showed that children were particularly unreliable in reporting about time factors, such as duration and onset of symptoms, and they concluded that highly structured diagnostic interviews might not be appropriate for use with children of elementary school age.
- Borgers et al. (2000) conducted two studies on the influence of cognitive development on response quality in questionnaire research with children and showed that data quality increases with cognitive growth. They concluded that children age 8 to 11 have enough language and reading skills to competently complete many common-type surveys. However, they also found that children of this age can answer only well-designed questions, have problems with negatively phrased questions, and have no tolerance for ambiguity.

- Borgers and Hox (2001) investigated the effect of item and person characteristics on item nonresponse with children age 8 to 18. They found that younger children do not perform as well as older children, as educational level appears to be related to performance. To reduce item nonresponse among young children, they suggested ways to make the instrument appropriate for young children, such as by avoiding ambiguous response scales or avoiding asking sensitive questions.
- Weber et al. (1994) asserted that the probability of privacy being invaded and not receiving true assent increases as the power differential between the interviewer and the child increases, thus making the interview less valid. They cited a study which showed that children process and conceptualize information in distinctly different ways than adults, and the child's changing interpersonal, verbal, and written skills will influence the success or failure of various interview strategies. More specifically, perception, memory, and reasoning that form the basis of cognition are different for children 6 to 12 years of age than for individuals 13 years of age and older.
- Stueve and O'Donnell (2000) found inconsistencies over time in seventh grade students' self-reports of sensitive behaviors, such as substance use and sexual intercourse. More socially undesirable behaviors, such as cocaine use versus cigarette use, were likely to be not reported upon follow-up. This finding suggests that reliability issues in younger children's data may be of greater concern for surveys that include sensitive questions in the interview.
- In the 2006 NSDUH Reliability Study, youths appeared less consistent than young adults and older adults in their reporting of substance use, particularly in the cases of lifetime and past year non-medical prescription drug use and past year alcohol use (Kennet et al. 2007). Again, this suggests that younger children might not have the cognitive capacity to accurately report past use.

A number of studies have examined children's cognitive capacity and how this relates to collecting accurate data from children. Based on this literature, it seems possible to conduct interviews with children under age 12 that elicit valid responses, as long as the instrument is designed to be age appropriate. However, necessary questionnaire changes would not address serious concerns about the accuracy of children's self-reports of sensitive behavior.

## **2.4 Questionnaire Mode**

The National Study of Child and Adolescent Well-Being (NSCAW) is a national study sponsored by the Administration for Children and Families that examines child and family well-being outcomes in detail and seeks to relate those outcomes to their experience with the child welfare system. NSCAW's sample includes a cohort of 6,000 children and adolescents who have come into contact with the child welfare system. Data are collected in four annual waves from the children, their biological mother, primary caregiver (if different), caseworker, teacher, and agency administrative records. Since responses of children are such a large part of the NSCAW data set, we can draw from their experiences designing survey instruments and modes for young children.

Evidence from NSCAW indicates that younger children are capable of participating in an audio computer-assisted self-interview (ACASI). In NSCAW, children between the ages of 11 and 17 participate in an ACASI interview. For children who are aged 5 through 10,



an “assisted ACASI” is used. Respondents listen to the question and point to their response on a show card. The interviewer then enters the response.

Use of ACASI with children younger than 12 is rare. One study evaluated the validity of reports of use of asthma-controller medication from children age 8 to 18 and their parents (Bender et al. 2007). Researchers compared ACASI, face-to-face interview, and Paper-and-Pencil Interview (PAPI) methods. They found that discrepancy between self-reported use and objective measures taken from electronic devices on the inhalers was highest in the ACASI mode and lowest in the face-to-face interview. Research conducted by Black and Ponirakis (2000) reviewed the advantages and disadvantages of using a computer-administered questionnaire to ask children sensitive questions. They listed developmental considerations when preparing the instrument to maximize valid answers and argued that both the structure and content of the questions should be appropriate for the cultural background and development level of the child.

Based on these findings, it appears that most children 11 years of age and older have the cognitive ability to respond appropriately to the ACASI instrument. Careful consideration should be given to administering the instrument via ACASI to children younger than 11 without assistance. Usability testing and cognitive interviewing could further inform this issue.

## **2.5 Questionnaire Complexity**

In order to assure that the questionnaire is age appropriate, we recommend that a reading level assessment be performed if a target population were to be expanded to include children younger than 12 years of age. Items identified as containing potentially age inappropriate items or constructs would have to be pretested with members of the younger age group in order to ensure that younger children are able to comprehend the questionnaire items.

The NSCAW questionnaire contains a wealth of questions that cover sensitive topics. These questions are asked of all respondents who are 11 and older. Topics include pregnancy and sexually transmitted diseases. The inclusion of such items suggests that other survey instruments could question 11 year olds about sensitive topics, such as those that are currently contained within the NSDUH instrument, but as discussed previously in Section 2.3, the validity of younger children’s self-reports may be questionable.

## **2.6 Questionnaire Timing**

A review of the timing data from the 2008 NSDUH reveals that 12 year olds have the longest interview lengths of interviewed minors. There is a general negative relationship between age and length of the interview, which begins to taper off with 15 year old respondents. As shown in **Table 4**, as the NSDUH respondent’s age increased, the length of the 2008 interview decreased. This relationship holds true for timing figures of the core modules, the non-core modules, the overall ACASI, and the total interview time. The completion times of respondents who are 15, 16 and 17 years old are quite similar to each other, while the 12 year olds’ timing is the highest.

**Table 4:** 2008 NSDUH Adolescent Total Timing Data, By Age

	Respondent Age (Years)					
	12	13	14	15	16	17
Sample Used in Analysis	3,475	3,665	3,777	3,808	3,933	3,814
Mean Length of IW (mins)	64.5	61.5	60.1	60.7	61.3	62.2
Variance	257.4	243.0	257.3	245.3	261.6	280.0
Std Dev	16.0	15.6	16.0	15.7	16.2	16.7

Experience from the NSDUH shows that differences in timing data are not uniform across questionnaire topics. These differences in timing could serve as a proxy for cognitive burden, especially among younger respondents. Across all age groups, timing data for the Tobacco, Alcohol and Marijuana modules are quite similar. Younger respondents take more time to answer the Risk Availability and Youth Mental Health Service Utilization modules when compared to older adolescent respondents. There are additional modules that take longer to administer to younger adolescents when compared to older adolescents. These include inhalants, the psychotherapeutic modules, and the youth experiences module. However, there are modules within the questionnaire that take longer to administer to older adolescents when compared to younger adolescents. These differences could be due to increased reporting of behavior, as opposed to the increased cognitive burden of answering the questions at a younger age. The modules that see a positive relationship between age and timing data include adolescent depression and substance dependence and abuse.

Because the mean timing data for the overall interview is higher for 12 year olds than for older adolescent respondents, we can expect that increasing a survey target population to include children younger than the age of 12 would increase the duration of the overall instrument administration. Depending on the age of the child respondent, a shorter questionnaire may be needed. Younger children may not be able to concentrate long enough to complete an instrument that averages 60-65 minutes in length or longer. However, it is possible that introducing an abbreviated questionnaire for younger respondents could lead to context effects for the survey.

## 2.7 Incentives

The positive effects of incentives on survey participation of adult respondents have been well-documented in the research literature. In a meta-analysis of studies that experimented with the effects of incentives on in-person surveys, Singer et al. (1999) found that cash incentives were more effective in raising survey response than were gifts and prepaid incentives. Simmons and Wilmot's (2004) literature review of effects of incentive payments on social surveys corroborates these findings. Further, Davies and Rupp (2006) found that debit card incentives—which are akin to offering cash—were associated with higher response rates than were checks and prepaid telephone cards.

Beyond the research on the impact of alternative incentive payment methods for adults, little research has assessed the effects of different types of incentives on children's participation in surveys. Currently, all NSDUH respondents are given \$30.00 cash as a token of appreciation for completing the NSDUH interview. Participation data from the NSDUH showed that cash incentives effectively lowered refusal rates among survey participants age 12 to 17 (Eyerman et al. 2005), suggesting that similar results might be observed if younger children were included in the study. Perhaps the most relevant study regarding the use of incentives in children's survey research was conducted by Bagley et al. (2007). This interview-based study included children age 4 to 16. Children were given hypothetical situations regarding their participation in research, which included depictions of incentives that differed by type and dollar value. The researchers found that cash incentives were most likely to be effective with children who are at least 9 years of age, for these children could appreciate the value of money in general and as compensation for their research participation. Children younger than 9 years of age, however, did not seem to have the same grasp on the value of money and were instead drawn more to the influence of non-monetary gifts. This study suggests that a different form of incentive, such as a gift card to a store well known to children, may be better received by many children under 9, but a monetary incentive might be effective for 9-12 year olds.

Another issue to consider is how incentives paid to parents might influence this process. Using a token cash incentive to help obtain parental consent was found to increase early response among young adults and, thus, lessen the need for intensive non-respondent follow-up (Mann et al. 2008). However, the impact of parental incentives on the overall final response rates among young adults was found to be insignificant. This study suggests that paying an incentive to parents may have at best a modest positive impact on the completion rate of interviews with their children, including those under 12 years of age.

## **2.8 Use of Parents as Proxy Respondents for Younger Age Groups**

A number of studies have investigated the validity of proxy reporting for young children. However, the value of proxy reporting has not been viewed as consistent across surveys.

When the survey topic is not sensitive and measures are related to facts which can be easily observed by others, proxy reporting seems to be more accurate. For example, Varni et al. (2007, 2) evaluated the quality of parent reports for children age 2 to 16 and found the parent proxy-report scales exceeded the minimum internal consistency reliability and construct validity. Russell et al. (2006) compared parents' and child self reporting on health-related quality of life and found high correlations. They concluded that parent reporting can be viewed as a reliable substitute when the child is either too young or too ill to provide a self-report. Frinkelhor et al. (2005) assessed the caregiver proxy report for Juvenile Victimization for children 2 to 9 years old. In a test of construct validity, endorsement of juvenile victimization items correlated well with measures of traumatic symptoms. They also found adequate test-retest reliability in a three- to four-week survey re-administration.

However, discrepancies between proxy reporting and children's self-reporting are often identified in the literature. On measures of reports of depressive symptoms in one study, children reported more symptoms than their parents did (Angold et al. 1987). Jensen et al. (1999) found that parents and children rarely agreed on the presence of diagnostic conditions (such as mental disorders and psychiatric symptoms) regardless of diagnostic

type, when children ranging from age 6 to 19 and their parents were independently interviewed. It has also been reported that parents' proxy reporting is not very accurate for assessing children's behavioral and emotional problems such as delinquent activity (Barry et al. 2008; Achenbach et al. 1987; Augustyn, 2002).

A few studies showed the potential value of proxy reporting, but also acknowledged that there was variance in the quality of proxy reporting depending on the topics of measurement. Rosenbaum et al. (2007) compared child and parent reporting on their relationship and communication about sex. They found that survey response discordance was not solely attributable to response bias. Items about concrete events yielded better agreement than hypothetical items. By assessing agreement between parent proxy and child respondents on an epidemiological study, Whiteman and Green (1997) asserted that agreement between responses from children and parent proxies depends largely on the types of information sought, rather than characteristics of the respondents. In summary, the literature suggests that asking questions about sensitive behavior, such as key measures of substance use in the NSDUH, may significantly limit the ability of parents to accurately respond for children under 12.

### 3. Summary

In this paper, we have documented several issues for consideration when determining whether or not to expand a survey target population to include children under 12. The main benefit of expanding a sample to include younger children is the ability to provide accurate estimates for this age group. For instance, under the current design of the NSDUH, the undercoverage of past year initiates aged 11 or younger affects the mean age at first use estimate. While the benefit of expanding a sample might be large, below is a summary of the key issues discussed in this paper that should be considered first by survey practitioners based on literature reviews and NSDUH data:

- **Refusal Rates** – On NSDUH, the parental refusal rate currently increases as the age of youth respondent decreases. As parents are more likely to refuse participation of their younger children, this trend might be exacerbated if children under 12 were included in the sample. This increase in parental refusals may have a negative impact on the response rate of the younger age group as a whole.
- **IRB Concerns** - IRB representatives raised concerns related to the cognitive ability of participants under 12 years of age because a lack of question comprehension may trigger unique thoughts among younger children, such as making them feel they should engage in the behaviors mentioned in the survey items. In addition, they might not comprehend confidentiality issues and the voluntary nature of their participation. Existing literature suggests that instrumentation experts would need to modify and test revised instruments and materials to adequately address potential concerns of the IRB about interviewing young children.
- **Data Quality** - The research suggests that the validity of young children's self-reports may only be acceptable when using an age-appropriate instrument and measuring non-sensitive behaviors. This stipulation implies the need to make significant changes to existing instruments to make them

appropriate for younger children, which would involve considerable effort for a survey such as NSDUH. Based on the NSCAW experience, it appears that surveys such as the NSDUH can assume that children as young as 11 will have the cognitive ability to respond to the ACASI instrument, but children younger than 11 would need assistance. Furthermore, the literature suggests that the nature of certain sensitive survey items, such as measures of substance use, may significantly limit the ability of parents to accurately serve as proxies and respond for children under 12.

- **Questionnaire Issues** - A reading level assessment would need to be performed on existing questionnaires if the target population was expanded to include children under age 12. Resulting changes would have to be pretested heavily with members of the younger age group in order to ensure that younger children would be able to comprehend the questionnaire items. Lastly, as the mean completion time for the overall interview is higher for younger respondents on NSDUH, one can assume that increasing the target population of the NSDUH to include children under age 12 would increase the duration of the overall instrument administration.

In summary, if expanding a survey target population to include children under 12 years of age, we suggest expanding the target population in such a way that would not require the development of new or significantly altered screening or interview instruments, such as only including children ages 10 or 11. This would potentially result in only minor adjustments to current data collection protocols while limiting the impact on data quality, instrumentation changes, and costs. Extensive usability testing and cognitive interviewing would need to be conducted to inform this decision and to ensure that children ages 10 or 11 could comprehend the questionnaire items and respond accurately to sensitive questions.

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