Face-to-face interviews with children. Question difficulty and the impact of cognitive resources on response quality

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Abstract

Increasingly, children of all ages are becoming respondents in survey interviews. While juveniles are considered to be reliable respondents for many topics and survey settings it is unclear to what extend younger children provide reliable information in a face-to-face interview. In this paper we will report results from a study using video captures of 142 face-to-face interviews with children aged 8 through 11. The interviews have been coded using behavior codes on a question by question level which provides behavior-related indicators regarding the question answer process. In addition, standard tests of cognitive resources have been conducted. Also, parents were asked a set of questions identical to the children's questionnaire. Using the responses from the parents as gold standard, we are able to assess the impact of the children's cognitive resources on respondent behaviors and ultimately on response accuracy.

KEY WORDS: Children, behavior coding, cognitive resources, respondent behavior, validity.

1. Background and Scope of Study[1]

Children and juveniles are increasingly becoming respondents in standardized surveys. Even though, the responses provided by these young respondents do not completely substitute proxy reports from parents and other caregivers, their answers add to the picture regarding the children's views, problems, living conditions, and consumer behavior – the older they are the more. As long as certain preoccupation is applied during questionnaire design and interview administration, juveniles from age 14 on are considered to be competent respondents who can speak for themselves when it comes to youth specific topics (Hess et al. 1998).

By contrast, in this paper we are concerned with the quality of data obtained form children who are below this age. In many studies elementary school children are surveyed themselves. However, the literature has pointed out that young children at this age consider standardized questionnaires based on limited cognitive capacities as compared to juveniles and adults (Borgers et al. 2000; Fuchs 2005). Assuming a negative impact of the limited cognitive skills on the question answer process (Scott 1997), the quality of data obtained from elementary school children has been questioned.

So far, mostly secondary analyses of existing data sets have been conducted in order to assess data quality indicators in surveys with children (Villancourt 1973; Hershey and Hill 1976; Marsh 1986; Amato and Ochiltree 1987; Scott 1997; Borgers 2003). Generally, data quality is assumed to be significantly lower among children in comparison with juveniles and adults.

E. g., in a study conducted by Borgers and colleagues (2000), years of education (as a proxy indicator for age and, thus, for the cognitive-developmental stage) influenced the internal consistency in multi-item scales. In addition, poor reading skills also had a negative impact on data quality (Borgers et al. 2000). Both finding are in support for the hypothesis that data quality increases with cognitive growth.

Consistent with these findings, in a previous study among children and juveniles aged 10 thru 21 the size of response order effects, scale effects, and the effects of the numeric values associated with response options decrease with age (Fuchs 2004; 2005). In general, in each age group comparison, the response effect reached the highest level among the youngest group – which is assumed to be cognitively least developed. At the same time, question order effects were smallest for the youngest respondents who were more likely to ignore contextual information when decoding the question meaning compared to older respondents.

By contrast, with ambiguous response scales younger children produced, less item non-response compared to older children, which seem to indicate better data quality (Borgers and Hox 2001). However, this contra-intuitive effect is likely to be related to the children's cognitive-developmental stage. It is assumed that younger children do not recognize the ambiguity of the response scale, which leads to more, however, less reliable responses.

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Findings from the analysis of item non-response in several self-administered surveys among children and juveniles from age 10 on exhibit no differences of item non-response across age groups (Fuchs 2003): Children of all ages show similar low item non-response rates. These findings suggest, that even though the children's limited cognitive resources might restrain their ability to answer survey questions, this very same constraint prevents them to recognize that they should have a problem with a particular question. As a result, those two contradictious consequences of the limited cognitive capacities counterbalance each other. In support of these results, deLeeuw and Otter (1995) found an interaction effect of age and clarity of a question with respect to data quality.

In sum, these findings provide some preliminary support for the assumed impact of the children's cognitive functioning on the quality of the question answer process. In our view, two effects are to be noticed: On the one hand, children have limited cognitive skills at their disposal. Thus, they develop a less extended question understanding and have problems retrieving the relevant information which in turn yields more problems when answering survey questions. On the other hand, those limited cognitive skill prevent children from recognizing that they do not fully understand a survey question.

In addition, even if they conceive any problem answering a particular item, children tend to answer the question anyway, because they feel bound to social and situational norms which encourage them to comply with the adult interviewer's request to respond. Because of these two mechanisms, part of a child's difficulty when answering questions remains unobserved. Thus, when looking solely at indicators available in the final data set, presumably we are overestimating the quality of the data obtained from young respondents, which is the point of origin for the research reported in this paper.

2. Research Question and Hypothesis

Usually, methodological research regarding child respondents is a by-product of substantive studies on child-related topics. As a consequence, the design of the methodological research is limited by design decisions motivated by the scope of the underlying substantive research project. Thus, most studies are forced to focus on specific dependent variables or have to disregard certain explanatory factors relevant for an explication of the children's respondent behavior. Also, many studies use characteristics of the final survey data as indicators for problems in the question answer process. In order to assess the quality of a survey response, several indicators are available: Some authors investigate item non-response (Borgers and Hox 2001; deLeeuw and Otter 1995; Fuchs 2003), others made use of response stability (Vaillancourt 1973) or deliberately generated response errors (Fuchs 2004; 2005). However, these measures are in a way distant to the underlying response behavior. Thus, in many cases the underlying social, communicative and cognitive processes leading to a survey response remain unobserved, because the final survey response provides only little insight regarding the conditions from which is evolves.

In our view, it would be desirable to observe the children's response behavior directly in the interview situation, which would allow a detailed coding of their conduct. Accordingly, in this study we will make use of video recordings of interviewer administered interviews with children. Based on the recordings we will be able to assess interviewer and respondent behaviors leading to a certain survey response in greater detail. Even though, this does not allow us to observe the question answer process directly, the data at hand provides us with a more detailed description of the behaviors that lead to a response collected from a child. One could object that the occurrence of problematic response behaviors does not necessarily harm data quality. It might well be that children just show another type of response behaviors without any danger regarding the quality of the data collected.

Since the analysis of the response behaviors does not reveal much regarding the survey responses' quality, is essential to evaluate the behaviors observed with respect to their validity. In an ideal world we would have record checks available in order to connect the observed response behaviors to the quality of the responses obtained. We would prove to what extent the problematic and non-problematic behaviors correlate with the true values. This would allow an analysis of the cognitive functioning's impact on data quality by dint of specific response behaviors. Since we do not have access to the true values, we will use answers obtained from the children's parents regarding the same questions as a "gold standard" (see the methods section below for details). Even though the responses obtained from the parents might be impaired by measurement error themselves, the varying degrees to which children and parents agree (depending on the occurrence or absence of problematic response behaviors) provide raw estimates of the validity.

In the literature, the children's cognitive abilities are mainly assessed using age, years of schooling or educational achievement as proxy indicators. More detailed measures are usually not available. Under these circumstances lack of cognitive functioning in a more general understanding is held responsible for the increase of measurement error among children and young juveniles. This lack of data limits not only any detailed analysis, at the same time theoretical reasoning is restricted. A comprehensive understanding of the underlying social and

cognitive processes leading to a child's survey response is not accessible given the less than optimal assessment of the children's cognitive abilities.

In our view, it is essential to disentangle to cognitive capacities available to the respondents. Several components of the concept "cognitive capacity" come into play when a survey question is answered. In this study we will assess three components of cognitive functioning:

(1) In order to develop an appropriate question understanding, respondents need to hold the question text in memory. Thus, our first hypothesis assumes that children with more advanced short term memory capacities will have less pronounced problems understanding the scope of the question. As a result they are less prone to problems related to question understanding.

(2) Once a question is held in memory respondents are able to decode its meaning. Even though, survey questions are worded using a simple vocabulary, children differ in their ability to determine the literal meaning of a particular questions due to more or less pronounced recognition vocabulary. Thus, children whose recognition vocabulary is less advanced will have more problems when decoding a question.

(3) Finally, once the meaning of a question is decoded respondents need to determine the response to this stimulus which requires a thorough processing of the question content and a memory search. Based on this reasoning we assume that children with higher degrees of general intelligence are less prone to problems answering a particular question.

3. Methods

This paper reports results from a methods study supported by a grant from the German Research Foundation (see footnote 1). A convenience sample of 150 Children aged 8 through 11 was recruited from local elementary schools with an adequate representation in terms of gender, SES and immigrants. Face-to-face interviews were conducted in the children's home. On average each interview took 30 minutes; the questionnaire contained 120 items and covered child related topics like school, spare time activities, pocket money, media consumption and the like. Most of the questions were taken from other youth studies or only slightly modified to fit our population (some new questions were developed from scratch). Parents or other primary caregivers were present in the dwelling at the time of the interview, however, preferable they were not attending the interview.

10 professional adult interviewers were recruited from the region (6 female and 4 male). They differed in terms of age and years of interviewer experience. All interviewers took part in 2 study related training sessions; in total all interviewers received 5 hours of study specific training.

In addition to the face-to-face interviews, all children underwent extensive cognitive testing in order to assess different dimensions of the children's cognitive abilities: a language-free tests of short time memory (Turner 2004), a comprehensive test for crystallized intelligence (CFT 20 test, also language-free) and a vocabulary test assessing the children's knowledge regarding German language (recognition vocabulary, Weiß 1997). The short term memory test was conducted prior to the interview, the intelligence test and the test of recognition vocabulary immediately thereafter. The whole session including the interview and all tests took about 90 minutes on average.

Written permission from the parents was obtained in order to video-tape the interviewer respondent interaction using digital video cameras. The tapes were transferred to mpeg-format and coded using transana PC software (www.transana.org). In order to cover interviewer behaviors and respondent behaviors, an advanced set of 35 behavior codes was applied (see Oksenberg et al. 1996 and Ongena 2005 for details on behavior coding). Codes covered not only verbal statements but also some non-verbal behaviors. Also, time stamps for each item were collected (also using transana coding software), which allows us to compute the time spent on each survey question. 4 coders were trained to review the video taped interviews and to code the visible or audible behaviors of interviewers and respondents on a question by question level. About 10 % of the material was coded twice in order to determine inter-coder reliability.

For the purpose of this paper we will focus on special respondent behaviors indicating the problems understanding and answering the questions mentioned in the hypothesis either implicitly or explicitly:

(1) Explicit indicators: Respondents ask interviewer to repeat a question; respondents ask for a definition or explanation regarding a question; respondents don't know the response to a question (DK). These three behaviors were treated as explicit hints towards problems in the process of understanding the question and combined into a singe measure of explicit problems.

(2) Implicit indicators: respondents provide an inadequate response, which is not codable; respondents show verbal or non-verbal signs of uncertainty. Even though, the respondent does not directly indicate that he or she has a problem with a particular question, these behaviors are interpreted as outcomes of potential misconceptions while

answering the question. They were combined into a composite measure of implicit problems.

Parents were asked to fill in a self-administered questionnaire replicating many of the questions from the children's instrument. For a subset of closed-ended questions that parents were assumed to be knowledgeable about (e. g., "Do you get pocket money?" if yes "How much?", "Do you play an instrument?" and the like), the answers obtained from each child were compared to the responses collected from the corresponding parent. Questions regarding the child's activities outside the parents' home were not considered for the comparison. Also, open questions were not included in this comparison.

This design provides us with a subset of 30 questions from the total 120 items in our questionnaire, which equals 3,968 question answer sequences in our behavior coding data set. For each answer the accordance of the child's answer to the parent's response was assumed if the child's response fully matched the respective parent answer. The accordance rate will be used in order to evaluate the validity of the children's responses.

The data collected in this methods study is combined into a 3-level data set with the single question as the basic unit of analysis. Those units are clustered into cases (respondents), which by themselves are nested according to the particular interviewers. Because for some of the children we do not have complete data available – either the video is incomplete or one of the cognitive assessments was not properly conducted – we had to drop a few cases from the analysis. The following results are based on 142 complete cases and a total of 16,697 question-level codes.[2]

4. Results

4.1 Respondent problems when answering the survey questions

Every interview is affected by at least one respondent behavior indicating either implicitly or explicitly problems when answering the question (table 1). Overall, 16 % of interviewer respondent exchanges are prone to at least one instance of problem-indicating behavior. While only 2 % of the questions are affected by an explicit DK and 4 % by a request for definition of the question's concept, in about 8 % respondents provide an inadequate response und in 4 % of the questions asked they show clear sign of uncertainty (even though they provided a codable response). In total, about 19 questions per respondent (out of a total of 120 items per interview) are affected be either implicit or explicit problems – most of which are implicit by nature. A detailed analysis indicates that children show either explicit or implicit signs of problems with the question: Only on rare occasions, respondents demonstrate explicit and implicit behaviors at the same time.

Table 1: Frequency of respondent behaviors indicating explicit or implicit problems when understanding the question

Respondent Behavior	% of cases	% of questions	questions per case
Inadequate response	97	8	10
Uncertainty	78	4	4
Total implicit problems	98	12	14
Don't know	78	2	3
Request for definition	84	4	4
Request to repeat question	39	1	1
Total explicit problems	99	6	7
Total problems	100	16	19

Note: N = 16,697 interviewer respondent exchanges (= questions asked), N = 142 respondents.

Further, we find a clear impact of question difficulty: For each level of difficulty we computed the proportion of question affected by respondent behaviors expressing problems either implicitly or explicitly (table not displayed). While only 6 % of the easy questions were answered inadequately, about 11 % of the responses to the most difficult questions were answered not codable ($p < .001$). The same is true for respondents showing uncertainty.

A similar pattern is visible for those respondent behaviors explicitly indicating problems in the question answer process: The proportion of DK is lowest for the easy questions (1 %) and highest for the difficult questions (6 %, $p < .001$). In addition, the proportion of requests by a respondent for a definition or explanation regarding the question is increasing with question difficulty ($p < .001$). Also, for the requests to repeat a question we have a statistically significant result ($p < .001$).

In total, the proportion of questions affected by any sign of respondent difficulty is about 2-3 times higher for the most difficult questions (26 %) compared to the easy ones (10 %, $p < .001$). This result was to be expected, however, at the same time it proves that children react to the difficulty of a particular question. Based on these findings it is important to recognize that problems while understanding

[2] Currently an extension of this project is being carried out: another 80 juveniles aged 13 are added to the data set in order to compare their response behavior to the elementary school children studied here.

a question do not always lead to DK answers or to a request for help by the interviewer. Instead, many of our young respondents comply with the interviewer's request to provide an answer even though they do not have a compelling understanding of a particular question. And even if they recognize that they should have a problem with a question (indicated by the visible and/or audible signs of uncertainty) at the same time they try their best to provide an answer.

Looking at table 2, one detects rather small variations of the overall pattern: for attitude questions as well as for behavior questions and questions on facts, we observe an increase of the implicit and explicit problems when answering more difficult questions. By contrast, in the residual group (mostly questions on proportions and numbers to be estimated) there is no significant correlation of question difficulty and the occurrence of problematic respondent behaviors.

Interestingly, in principle children seem to be able to respond to attitude questions. At least in our coding data we do not find a significant increase in the proportion of explicit problems. However, the proportion of implicit problems is moderately higher for attitude questions.

Table 2: Frequency of problematic respondent behavior by question difficulty and type of question

Respondent Behavior	**Question difficulty**			
	Low	**Interm.**	**High**	**Total**
Attitude questions				
Implicit problems	11	13	20	15 ***
Explicit problems	4	5	7	5 **
Total problems	14	16	24	18 ***
Behavior questions				
Implicit problems	9	12	16	11 ***
Explicit problems	3	7	14	7 ***
Total problems	11	18	27	16 ***
Questions on facts				
Implicit problems	5	10	17	8 ***
Explicit problems	3	7	17	6 ***
Total problems	8	15	17	13 ***
Other questions				
Implicit problems	-	33	17	28 **
Explicit problems	-	12	11	12
Total problems	-	40	24	34 **

* p < .05; ** p < .01; *** p < .001.

Girls and boys show implicit and explicit problems to the same extend. Only marginal differences in terms of the frequency of implicit respondent behaviors are to be noticed. Also, there are virtually no differences by age. The only exemption is the proportion of DK which is slightly larger for the older group ($p < 0.05$). However, it should be noted that the age range of the sample studied is rather narrow, thus not much variance was to be expected.

4.2 Impact of cognitive functioning on respondent behavior indicating question understanding

In order to assess the impact of general processing abilities on the occurrence of problem-indicating respondent behaviors, all children underwent a general intelligence testing which provides us with an assessment of their crystallized intelligence.

Tab. 3: Frequency of problematic respondent behavior by levels of various cognitive capacities

Respondent Behavior	**Cognitive capacity**			**Total**
	Low	**Interm.**	**High**	
Test of short term memory				
Inadequate response	10	8	7	8 ***
Uncertainty	4	3	3	4 **
Implicit problems	13	10	10	12 ***
Don't know	2	2	3	2 **
Request for definition	4	3	4	4
Request to repeat question	1	1	1	1
Explicit problems	6	5	7	6 *
Test of crystallized intelligence				
Inadequate response	9	8	8	8
Uncertainty	4	3	3	4
Implicit problems	12	11	11	12
Don't know	3	2	3	2
Request for definition	4	3	4	4
Request to repeat question	1	1	1	1
Explicit problems	7	6	6	6
Test of vocabulary recognition				
Inadequate response	9	9	7	8 ***
Uncertainty	5	3	3	4 ***
Implicit problems	13	12	10	12 ***
Don't know	3	2	3	2
Request for definition	5	4	3	4 ***
Request to repeat question	1	1	1	1
Explicit problems	8	6	6	6 **

* p < .05; ** p < .01; *** p < .001.

In addition, we applied a test of their short term memory in order to measure the children's ability to hold the question content in memory. Also, a test of recognition vocabulary was conducted in order to test for differences

regarding the pre-requisites of literal question understanding. The standardized score for each test were approximately normal distributed (see Fuchs 2007 for details). Subsequently the scores were grouped into three levels (low, intermediate, and high levels of the respective cognitive capacities).

The results displayed in table 3 suggest a rather moderate effect of short term memory on the proportions of implicit and explicit problems. The data indicates a marginal increase in the proportion of explicit problems for children with advanced short term memory capacities – which is contrary to expectations ($p < .05$). By contrast, the proportion of implicit problems is more pronounced for children with less than average short term memory capacities.

A similar correlation becomes apparent when it comes to the language skills: Children with less advanced recognition vocabulary show larger proportions of implicit problems when answering survey questions ($p < .001$). This finding holds true for inadequate answers as well as for uncertainty ($p < .001$). Also the proportion of explicit problems is larger for kids with less advanced recognitions vocabulary ($p < .01$); which is mostly due to the higher proportion of requests for a definition. The proportion of DKs and the proportion of requests to repeat the question are not affected by recognition vocabulary.

Also, no effect can be observed for crystallized intelligence. Children show almost the same levels of implicit and explicit problems regardless of their intelligence. So within the age group assessed here, the level of intelligence has no impact on the occurrence of implicit and explicit problems while answering a survey question.

4.3 Impact of problematic respondent behavior on data quality

In order to judge the problematic respondent behavior with respect to its impact on data quality we need to validate the responses obtained. It might well be that respondents provide us with a valid response even though their response behavior was coded as problematic. Also, it might well be that respondents provide responses of low quality without any visible problems. Since we could not use records checks or administrative data in order to prove the answers, we decided to compare the children's responses to the respective answers obtained from their parents (see section 3 for details).

In total, parents and children agree in about two thirds of the cases (65 %). Given the data set at hand, we are unable to determine the reasons for the lack of concordance in the remaining 35 % of the questions asked. It might well be that the parents just do not know the true answer because they are not aware of the behaviors, attitudes, or possessions of their children. At the same time, the discordance might be caused by the children having problems understanding and answering the questions.[3] In order to find a preliminary answer, we compare the levels of accordance according to levels of question difficulty.

Table 4: Accordance rate by type of question and question difficulty

	Question difficulty			Total
	Easy	Interm.	Difficult	
Attitude	60	49	28	46 ***
Factual question	84	61	–	79 ***
Behavioral question	66	62	49	63 ***
Total	72 ***	60 ***	38 ***	65 ***

Note: N = 3,968 interviewer respondent exchanges (questions asked); N = 142 respondents. *** $p < .001$.

Table 4 shows the accordance rate for easy, intermediate, and difficult questions. While for easy questions the accordance rate reached 72 %, the respective value for the difficult questions is as low as 38 % ($p < .001$). Generally speaking the accordance rate is lower for attitude questions and higher for factual questions. The accordance rate reaches its highest value for the easy factual questions (84 %). For these questions we assumed, that parents would be completely knowledgeable. Based on this assumption, these findings suggest that about half of the lack of concordance of parents and children is due to the parent's nescience or measurement error on the parent's side, while the other half is due to the children's problems when answering our survey questions.

Given the evidence at hand, we are reluctant to fully trust the parents' responses. However, at the same time the accordance rate reaches a level that is beyond random and thus, allows at least a preliminary assessment of the validity of the children's responses. In order to evaluate the possible impact of problematic respondent behaviors on data quality, we computed the accordance rate for instance where those problematic behaviors occur and compared the estimated validity to interviewer respondent exchanges, where no such behaviors were to be coded.

Table 5 summarizes the respective results. Overall the accordance rate is about 15 percentage points lower for those survey responses that were accompanied by an implicit problem behavior (52 % compared to 67 % without implicit problems; $p < .001$). This effect is even more

[3] Also, we should note, that the accordance rate was computed based on the final survey response, which might be collected after some probing and providing clarifications by interviewers – if needed. Thus, the accordance rate expresses to a certain degree the interviewer performance as well. Also, it should e noted that the responses obtained from the parents are prone to measurement errors as well.

pronounced for factual questions (19 percentage points; $p < .001$) and slightly smaller for behavioral questions (12 percentage points; $p < .001$). For attitude questions the effect does not reach statistical significance (5 percentage points, not significant).

Table 5: Accordance rate by problematic respondent behavior and type of question

	Implicit problems		Explicit problems	
	No	Yes	No	Yes
Attitude	47	42	47	30
Factual question	80	61 **	79	75
Behavioral question	65	53 ***	64	55
Total	67	52 ***	65	58

Note: N = 3,968 interviewer respondent exchanges (questions asked); N = 142 respondents. ** $p < .01$; *** $p < .001$.

For the respondent behaviors expressing explicitly a problem with a particular question, no significant effect can be observed. Even though, the estimated difference for the accordance rate for interviewer respondent exchanges with and without explicit problems shows the same pattern as with the implicit problems, the effect is smaller in size (7 percentage points) and does not reach statistical significance. This might be due to the fact, that the interviewers have solved part of the problems because they were stated explicitly, thus, enabling interviewers to provide a definition, repeat the question, or probe for an appropriate answer.

In sum, we found some evidence that implicit problem behavior indicates lower validity while explicit problems do not correlate with a lower accordance rate. Since the cognitive resources (especially recognition vocabulary and short term memory) have an impact on implicit problem behavior, and implicit problem behaviors have proven to yield data of reduced validity, we assume that low cognitive resources lead to data of limited quality.

5. Summary and Discussion

The results reported in this paper demonstrate that children show quite a lot of respondent behaviors indicating problems understanding and answering survey questions. Two thirds of the problems are implicit by nature, suggesting that children answer survey questions even if they have problems processing them. Only one third of the problem behaviors are explicitly stated by the children (DK, request to repeat the question, request for a definition). This finding shades light on the power of social and communicative norms underlying the interview setting in child interviews.

In the light of our finding, implicit problems are a greater danger to the quality of the responses obtained compared to explicit problems. While explicit problems provide the interviewer with the possibility to intervene and solve potential misconceptions (which in turn will improve the validity of the response), implicit problems are more complicated to detect and to resolve. Even though interviewers were trained to probe and solve problems when the children provide an initial answer that could not be coded (because it would not fit the response categories), the occurrence rate was far lower for interviewer respondent exchanges where such behaviors occurred. The fact that the answers provided by the children after appropriate probing were less valid compared to the responses where no such problems occurred, suggests that the probing might polish the data superficially (the child provides a codable response), however, the quality of the answer obtained remains dubious.

The occurrence of implicit problems is related to the children's short term memory and recognition vocabulary. The more advanced the children's short term memory and recognition vocabulary, the smaller the proportion of implicit problems. The general intelligence is not related to the appearance of such behaviors. These findings indicate that children with limited cognitive resources provide data of inferior quality because of two effects: Their limited short term memory restricts them to hold the question in mind and their reduced recognition vocabulary hinders them to fully decode the question meaning. To what extent the cognitive capacities are responsible for the possible effects of probing and problem solving by interviewer has to be assessed in future analyses.

Since the age range of our sample is rather narrow (mostly children aged 9 and 10 with some 8 and 11 year olds) the variation of cognitive skills within this group is limited. Thus, the effects of cognitive functioning visible here are not sufficient in order to assess and explain differences of young children vs. juveniles and adolescents in terms of their response behavior and data quality. Thus, currently an extension of this study is underway. We will include a sample of 13 year old juveniles in order to compare their response behaviors to the behaviors of the children studied here. This extension will provide us with the opportunity to assess the impact of cognitive functioning across age groups. While we found only moderate effects of cognitive functioning within the 8 through 11 year olds, we will be able to assess the impact of cognitive functioning in children as compared to juveniles.

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